ISLAND AGRICULTURE
ICAR-CIARI NEWSLETTER

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

Vol. XIV. No.2 **April to June, 2021**

Dr E.B. Chakurkar Joined as Director, ICAR-CIARI, Port Blair

Dr. Eaknath Bhanudasrao Chakurkar has taken over as the Director of ICAR-CIARI, Port Blair w.e.f 28th April 2021. Dr. Chakurkar has more than 3 decades of research experience in the field of animal reproduction & technology, integrated farming system research for coastal ecosystem. He has served as Director (Acting), ICAR-Central Coastal Agricultural Research Institute, Goa, before joining the ICAR-CIARI. He graduated from Marathwada Agricultural University Parbhani, with his B.V.Sc. & AH and M.V.Sc degrees. He obtained his Ph.D. from Bombay Veterinary College. He was selected for Agricultural Research Service and joined ICAR in 1991 and joined CCARI, Goa in 1992 and served there till April 2021. His field of expertise include Reproductive techniques in Animal Reproduction like synchronization of estrous, use of ultrasonography, seminology in pigs, rabbits and cattle. He has published several research articles in national international journals, authored and edited number of books, manual, bulletins etc. He is recipient of prestigious "Fakhruddin Ali Ahmed Award" by Indian Council of Agricultural Research for his outstanding agricultural research in tribal areas, recognised as Fellow of National Academy of Veterinary Sciences for research in the field of veterinary and Animal husbandry, awarded with Animal breed registration award for registration of pig breed (Agonda Goan) and cattle breed (Shweta Kapila) from Goa, and also awarded with number of society/state level awards for his outstanding contribution in the field of animal husbandry. Recently, a patent has been granted for his work on the invention of semen extender for preservation of boar semen technology.

From Director's Desk …

The Andaman & Nicobar group of Islands in Bay of Bengal and Lakshadweep Islands in Arabian Sea is well known for its unique biodiversity and unexplored flora and fauna which have created interest at National and International level. The Islands have about 46500 ha under all the agricultural crops with major area of over 20000 ha under coconut. The territory has a major coast line highlighting the importance of fisheries and typical coastal climate. The diverse flora and fauna having horticultural importance, unique breeds of domestic animals sustaining the

livelihood of tribal population, diverse settler communities & tribal population with typical food habits, posing challenges to sustain the fragile production systems makes this as topic of interest among the researchers. The horticultural based integrated farming system of the Islands has enormous potential for providing livelihood options and can play a significant role in supporting agro-tourism based economy.

The Institute has developed number of varieties, production and protection technologies for enhancing the productivity of the agri/horti/animal/fisheries sectors under island climatic conditions. in the coming years, our focus would be to carry forward these technologies to the stakeholders through KVKs, line departments for increase in production, productivity and improvement in livelihood through High Density Multi- species Cropping System, Integrated farming system, Broad Bed and Furrow system, Homestead based Integrated farming system for the tribal's, protected cultivation, seed village to provide truthfully labelled seeds etc for the betterment of Island Agriculture. In commemoration of the India @75 and ICAR @100, our institute has initiated number of programmes under the banner of Bharat Ka Amrit Mahotsav with an aim to doubling of the farmers income, making the island farmers and islanders self-reliant (Atmanirbhar).

Despite the impact of 2nd wave of COVID-19 pandemic, the quarterly period from April to June 2021 has witnessed many important events and commendable research achievements. I congratulate all the staff members for their tireless efforts and dedication for progress and development of the Institute.

1. Research highlights

a) Fish Health Management Survey

The attitude and perception of stakeholders on the aspects of fish health management in Andaman and Nicobar Islands was studied through a semi-structured questionnaire. The responses were collected and compiled from a total of 156 fish farmers from South Andaman and Nicobar group. Altogether the respondents from South Andaman (40 villages) and Nicobar (Campbell Bay) were interviewed to analyze the perception in order to recommend better management practices.

b) Isolation of coliform bacteria (*Citrobacter werneriis*)

A gram-negative coliform bacteria *Citrobacter wernerii*s isolated from a diseased *Clarias magur* (catfish) and confirmed based on PCR and sequencing of the 16S rRNA gene. The pathogen was associated with open dermal ulceration, forming deep, multiple, cavities on *C. magur*. This report forms first information of the infection of the gram negative bacteria on the catfish *Clarias magur*.

c) Effect of sea weed extract on yield and quality of cowpea

An experiment was conducted to study the effect of application of sea weed extract on yield and quality characters of cowpea. The fresh brown seaweed (*Sargassum wightii*) was collected from South Andaman coast and washed thoroughly with tap water to remove

the sediments and shade dried. After drying, it was powdered and an aqueous extract was prepared by adding water in 1: 5 ratio. The Sea weed extract (SWE) was foliar applied on cow pea at 30, 45 and 60 days after sowing at 6 different concentrations *viz*., 0, 2%, 10%, 15%, 25% and 100%. Foliar application SWE at 25% concentration increased grain yield of cowpea by 37% when compared to control (15.4g/plant). Similarly the phytochemical analysis indicated significant increase in total phenols and flavonoid contents (80.8 to 124 mg GAE/100g and 39.6 to 104.7 mg Rutin/100g respectively) in grains. The antioxidant activity measured by DPPH also increased from 584 in control to 673 mg BHT/100g. Thus SWE has the potential to increase the quality and productivity of grain cowpea under low input conditions.

d) Survey on ethno-veterinary medicinal (EVM) plants by Nicobari tribe of Andaman and Nicobar archipelago

There is a say that, ethno-veterinary medicinal plants are used by *Nicobarese*, an isolated indigenes in Nicobar group of islands. To find out the fact about the banality, a survey was made in Nicobar group of islands and a total of 20 medicinal plants in use by the Nicobari tribes were identified (Pate 1). The plants were exclusively said to be used to treat ophthalmic complications, respiratory and gastrointestinal disorders, for deworming and as an appetizer of the animals. Panel of identified plants along with their further details have been listed below:

Sl No.	Common name in Nicobari Mon-Khmer language	Botanical name	Indication
1.	TöKURòTòNG	*Tabernaemontana crispa*	To treat gastro intestinal problems specifically bloody diarrhoea
2.	TANFÃTö	*Sida cordifolia*	To treat bone diseases
3.	Combination of ÔLKA; TACHUHÚRÒi; HiNYôYö;HANöHMISõKKö	*Annona reticulate*; *Alstoniama crophylla*; *Glochidion calocarpum*; *Premna corymbosa*	Anti-inflammatory agent to treat swelling
4.	Combination of Mufut; Raneúl; Hingot;Pööcho; Amra	*Paederia foetida; Glycosmis pentaphylla*; *Fleugga virosa*; *Ehretia laevis, Spondias pinnata*	Used as anthelmintic
5.	Combination of Raneúl + Amra	*Glycosmis pentaphylla*; *Spondias pinnata*	Used as anthelmintic and to mitigate ophthalmic problem
6.	KUYAVö	*Psidium gujava*	To treat gastrointestinal and respiratory problems
7.	Combination of TöKURòTòNG;KUYAVö;Chamrevo;Tokiteuny	*Tabernamontana crispa*; *Psidium gujava*; *Lepisanthes rubiginosa*; *Leea indica*	To treat dysentery
8.	Combination of TöKURòTòNG; Marvalu	*Tabernamontana crispa*; *Abutilon indicum*	To treat dysentery
9.	Combination of Meuitameuyo;Hakonpookore	*Sida acuta*; *Ageratum conyzoides*	To treat ophthalmic problems

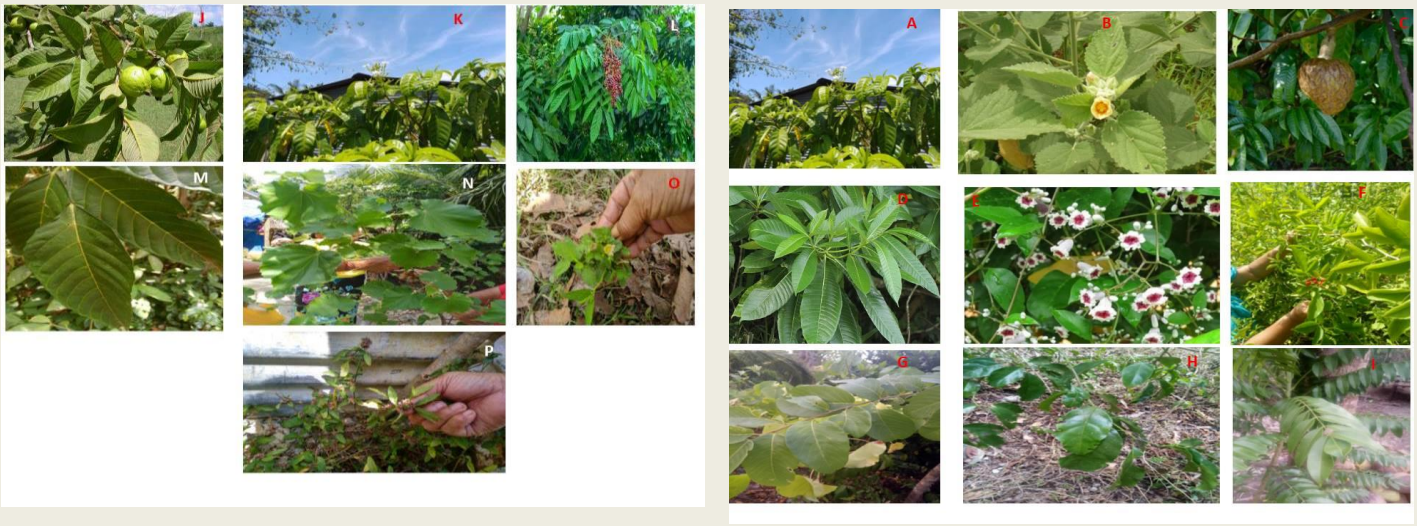

Plate 1. Species of herbal plants identified on the basis of survey in Nicobar group of islands (A)*Tabernaemontana crispa* (B) *Sida cordifolia* (C)*Annona reticulate* (D)*Alstoniama crophylla* (E)*Paederia foetida* (F)*Glycosmis pentaphylla* (G)*Fleugga virosa* (H)*Ehretia laevis*(I)*Spondias pinnata* (J)*Psidium gujava* (K)*Tabernamontana crispa* (L)*Lepisanthes rubiginosa*(M)*Leea indica* (N)*Abutilon indicum* (O)*Sida acuta* (P)*Ageratum conyzoides*

e) FAMACHA: A double edged sword to control blood sucking helminths and anthelmintic resistance in goats

FAffa Malan CHArt (FAMACHA) has been coined from the name of Dr. Faffa Malan, a South African Veterinarian who evolved the technique for treating the animals infected with *Haemonchus* using clinical anaemia as the determinant (Plate 2). The test is based on the assessment of colour variation of the conjunctival mucous membrane. The standard chart colour varies from pink red (normal) to white (anaemic) , for which scores are allotted as 5 (normal) to 1 (Anaemic). Several studies have been conducted worldwide for the use of FAMACHA as diagnostic tool to correlate the anaemic status of the animals with the gastrointestinal worm load. The Scientists of Animal Science Division have standardized this chart to be used in the goat. On the basis of FAMACHA score and faecal egg count, the goats were treated with benzimidazole compound and macrocyclic lactone.

Plate 2. Use of FAMACHA in goat for detection of anaemic status of the animal

After 10 days of the anthelmintic treatment all the animals were checked for FAMACHA score and faecal samples were examined for faecal egg count (FEC) and blood parameters. The result indicated that there was significant ($P<0.05$) reduction in the faecal egg count of *Haemonchus* sp from 1200±155.76 to 525±75, *Strongyloides* sp from 469.57±77.37 to 78.26±33.83 and *Eimeria* sp from 900±240.05 to 195.65±55.34 respectively. The

FAMACHA score of aneamic goats improved from 4.08±0.11 to 3.2±0.13. The mean haemoglobin (g/dl), Packed cell volume (PCV), Red Blood Cell (RBC) and White Blood Cell (WBC) improved from 8.33 to 8.99, 22.66 to 24.86, 13.73 to 14.76 and 18029 to 19894, respectively which indicated clinical improvement. Highly significant ($P<0.01$) correlation was observed between the FAMACHA score and the haemoglobin level. Based on the result of the present study, it could be concluded that FAMACHA is a very handy tool to detect anaemic status of the animals and correlate with gastrointestinal parasitic load in the field. Thereby the risk of anthelmintic resistance and cost involved in this could easily be prevented.

f) Tri-model therapy modulates the antioxidant and stress hormone profiles in humpsore affected animals

Innovative tri-model therapy is combined therapeutic protocol of ivermectin, diethylcarbamazine and herbal ointment to treat the disease humpsore. Treatment procedure: (1) humpsore is cleaned with liquid soap, (2) un-ripened papaya mist was applied on the wound for 30 min for 3 days, (3) application of antiseptic and fly repellent ointment daily for 30 days, (4) injection of Ivermectin (200µg/kg body weight) or Doramectin (300µg/kg body weight) is by subcutaneous at fortnight interval for a month and (5) Diethylcarbamazine citrate 6 mg/ kg body weight was administered orally in morning daily for 30 days. In the treated animal, antioxidants, oxidative stress marker and stress hormone profile were studied at day 0, 7, 14, 21 and 28. Antioxidants such as total antioxidant capacity, superoxide dismutase and catalase were lower and oxidative stress marker such as malondialdehyde and stress hormone such as cortisol were increased in humpsore affected animals than in unaffected animals at day 0 whereas level of these antioxidants was increased and oxidative profile was reduced significantly in ivermectin alone and tri-model module treated animals at day 7, 14, 21 and 28. Out of these treatment groups, tri-model treated animals had significantly higher antioxidant profiles and lower oxidative profile than ivermectin alone in different days of analysis (Fig.1).

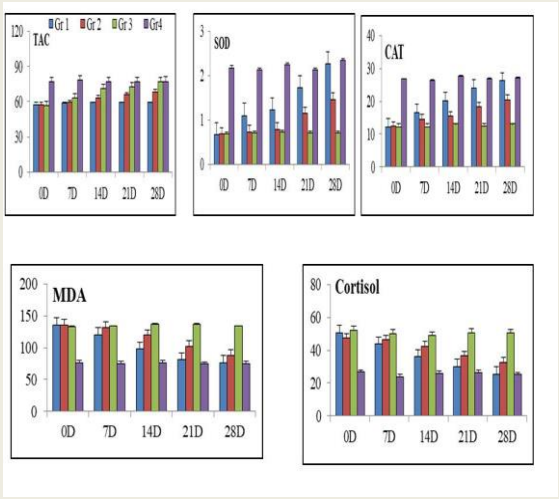

Fig.1. Antioxidant and oxidative stress profiles in humpsore-treated cattle

TAC: Total antioxidant capacity (µM/L), SOD: superoxide dismutase (U/mL), CAT: catalase (nM/min/mL), MDA: malondialdehyde (µM/L) and cortisol (ng/mL). Gr 1: control, Gr 2: treatment group with ivermectin alone, Gr 3: treatment group with tri-model therapy and Gr 4: unaffected animals.

2. Training/awareness programme

OFT

a) Influence of brown manuring on the growth and yield of maize

OFT on the influence of brown manuring on the growth and yield of maize was carried out in four farmer's fields at Gupatapara, New Mangluton villages of South Andaman. The results revealed that the growth and yield attributes of maize were significantly influenced by brown manuring. Significantly taller plant and highest dry matter production were recorded in *Dhaincha* intercrop *fb* 0.5 kg of 2, 4-D, Na salt on 30 DAS+ 75 % RDF. Cob length, cob girth, no of grains/cob was showed significant influence among nutrient management practices. A significantly higher grain yield of 46.4% and a stover yield of 77.1 % was recorded with the *Dhaincha* intercrop *fb* 0.5 kg of 2, 4 Na salt on 30 DAS+ 75 % RDF as compared to farmer's practices.

b) Foliar application of PPFM on drought tolerance in black gram

OFT on the effect of foliar application of PPFM on drought tolerance in black gram conducted in four farmer's fields of South Andaman. The application of PPFM was to fasten seed germination and seedling growth and seedling vigor. It accelerates vegetative growth, which leads to improves leaf area index and chlorophyll content of the leaf. Foliar application of 1% PPFM recorded higher seed yield and haulm yield of black gram than other treatments. Higher chlorophyll stability index of 61.4 and seed yield (540kg/ha) observed in PPFM 1% applied plot, which was comparable with an application of PPFM 2%.

c) Field Day

ICAR-KVK, Port Blair has organized four field days on black gram and green gram under cluster front line demonstration on pulse during 06.04.2021 and 09.04.2021. Two field days were conducted in the farmer's field of Mrs. Shantilal Toppo and Mr. Mangra Kharia at Abhaygarh village of Nilampur panchayat. In these field days, eighteen farmers and farm women were benefited, out of which eight male and ten female. Whereas the other two field days were organized in the farmers field of Mr. Hilarus Ekka and Mr.Chilgu Bech farmers' field of Adazig village, Sundergarh panchayat. On this field day, twenty-three farmers were benefited, out of which ten male and 13 female. KVK officials briefed about the importance of pulses in daily diet and restoration of soil health. On this occasion, farmers chaired their experience and performance of black

gram (var. VBN (Bg)-8 and CARI Urd-1) and green gram (CARI Moong-3 & CO-8).

3. Other Programme

a) Scientist-Farmer Interaction

Scientist farmer's interaction was conducted on 7th April 2021 at the community Hall, Dharampur village. In the program, Dr. Y Ramakrishna, Principal Scientist and Head along with the KVK staff discussed the problems of the farmers in North and Middle Andaman and suggested remedial

measures to the farmers and directed the KVK staff to conduct need based program for the benefit of the farmers. After the program, Dr. Ramakrishna along with KVK staff also visited the field of some progressive farmers of the area. A total of fourteen farmers participated in the program.

b) XIV Institute Research Council (IRC) Meeting

The XIV Institute Research Council (IRC) meeting for the year 2021 was conducted from 26th to 28th April, 2021 for Institute funded project through video conferencing wherein a total of 38 projects were presented by the Scientists, of which 08 were closed and 30 recommended to be continued. A total of 04 new projects and 03 technologies were also recommended by the house.

c)Interactive Meet

Dr. Deepitha, Dr Sreepriya P, Dr. Gladston Y and Dr. R Kiruba Sankar organized "Fish canning interactive meet with an entrepreneur on 06th June, 2021 to sensitize the prospects of processing and value addition sector in the Islands.

d) Mini Feed Mill for production of least cost balanced rural poultry feed

A need based specific program was taken by ICAR-CIARI to meet out the feed requirements of rural poultry in South Andaman to improve the production of small scale poultry farming. A standardized least cost feed including locally available feed ingredients has been formulated by scientific team of Dr. T. Sujatha, Dr. P. A. Bala, Dr. D. Bhattacharya, Dr. Jai Sunder and Dr. A. K. De, Division of Animal Science, ICAR-CIARI, Port Blair for scientific feeding of vanaraja and rural poultry. Subsequently, mini feed mill, the resource for manufacturing rural poultry feed has been established at Livestock Farm Complex, ICAR-CIARI under funding of NABARD, Port Blair to

establish small scale poultry feed production unit. This mini feed mill unit will empower farmer to produce balanced poultry feed with locally available feed ingredients to augment rural poultry feed production on famers participatory mode. This unit will also facilitate farmer to establish their own poultry feed production unit to augment their socio economic status. Many SHGs are invited to avail this facility as incubation centre to generate self employment through production of rural poultry feed and other livestock feed as well. If they are empowered in preparation of balanced rural poultry feed using mini feed mill, rural poultry farming will be the sustainable resource for livelihood security. There is a great potentiality of improving the rural poultry farming in South Andaman

4. Participation in National Seminars/ Symposia/ Conferences/ Workshop/Training

Participants	Topic	Venue/ Conducted by	Date
Pooja Bohra and Ajit A. Waman	Advances in Plant Biotechnology and Genome Editing	ICAR-Indian Institute of Agricultural Biotechnology, Ranchi and PTCA (I)	8th – 10th April, 2021
Ajit A. Waman	MDP on Biodiversity and Environmental Laws for Agricultural Researchers	ICAR-NAARM, Hyderabad	7th -9th June, 2021
Deepitha RP, Sreepriya P, K Saravanan, Ajina S.M and Gladston Y.,	Casting into the future of Fisheries and Aquaculture	School of Fisheries, Centurion University of Technology and Management (CUTM), Odisha	22nd- 23rd June, 2021
Deepitha, RP, Sreepriya P and R Kiruba Sankar	Aspects of establishing fish incubation center	IIFPT, Thanjavur	27th May, 2021
K. Saravanan	International Conference "Eco-erissa-2021"	ECOR Foundation, Cochin	5th -6th June, 2021
K. Saravan	Aquaculture Health Management	College of Fisheries, Kishanganj, Bihar Animal Sciences University	19th June, 2021
Gladston Y. and Ajina S. M	Recent advances in harvest and post-harvest technologies	NABARD and ICAR- CMFRI, Kochi	30th June, 2021
Gladston Y. and Ajina S. M	Perspective on fish taxonomy	TNJFU, Nagapattinam on	5th July, 2021
Y. Ramakrishna and N. Bommayasamy	Zonal workshop on Action plan –(2021-22)	ICAR-ATARI, Zone-V,Kolkata	8th June, 2021 to 9th June, 2021
Pooja Kapoor	National Dialogue on innovative food for hospitality Industry	ICAR	22th June 2021
Y Ramakrishna and N. Bommayasamy	NICRA online workshop on finalization of annual action plans of KVKs of West Bengal and Andaman & Nicobar Islands	ICAR-ATARI, Zone-V,Kolkata	23rd June, 2021
Pooja Kapoor	Approaches for protective cultivation in Uttar Pradesh	ICAR-ATARI, Kanpur	29th June 2021

5. Important meetings attended by Director, CIARI

Date & Time	Name of Programme / Purpose
12/04/2021	Six monthly review meeting of the XXV ICAR Regional Committee –II Discussed about the ATR and follow-up action/taken/initiated on recommendations made in the XXV meeting of the ICAR Regional Committee No.II on 08/10/2020.
23/04/2021	1st Meeting of the 9th RAC on virtual mode discussion held for Scientific and staff strength; list of the ongoing projects; list of the completed projects; salient achievements of the project; technology developed were Discussed/ prepared/presented by the HoDs pertaining to their respective division. Further, ATR of the last RAC; Awards; Future Research programmes were also deliberated.
26/04/2021 to 28/04/2021	XIV Institute Research Council meeting- 2021 for institute funded projects. Director, ICAR-Central Island Agricultural Research Institute as Chairman (IRC) gave remarks and discussion held for various institute funded projects/new proposed/ongoing projects from respective division.
07/05/2021	Virtual meeting with Assistant Director General, ICAR, discussion held on preparation of EFC/SFC and allocation of budget for the period 2021-22 to 2025-26 under the Chairmanship of DDG(HS), ICAR
11/05/2021	Virtual Meeting to discuss following concept notes for the SFC plan period 2021-2026 1 Organic farming in horticulture. 2 Protected cultivation in horticultural crops.
05/06/2021	Director, ICAR-CIARI delivered talk in All India Radio, Port Blair on 5th June 2021 on the occasion of World Environment Day : Theme *"Reimagine. Recreate. Restore"* and its focal point is ecosystem restoration"
08/06/2021	EFC / SFC presentation by the Scheme Head and Individual Institute. Discussion held about the EFC / SFC presentation of Scheme Tropical, Subtropical and Temperate fruits by the Scheme Head and Individual Institute under the Chairmanship of DG, ICAR.
09/06/2021	Virtual meeting of Presentation of EFC / SFC under Scheme-I
23/06/2021	44th Institutes Foundation Day, Director, ICAR-CIARI deliberated the foundation speech to all the officials of ICAR- Central Island Agricultural Research Institute.

6. Celebration

a) 44th Institute Foundation Day

ICAR-Central Island Agricultural Research Institute, Port Blair celebrated its 44th Foundation Day on 23rd June 2021 through virtual mode. The programme was attended by all the staff members of ICAR-CIARI, KVKs of South Andaman, North & Middle Andaman & Nicobar Districts. Dr. D. Bhattachrya, Pr. Scientist welcomed the Director and staff members of the institute. In his address, Dr. E. B. Chakurkar, Director, ICAR-CIARI thanked Indian Council of Agricultural Research, New Delhi for recognizing the importance of island ecosystem research to established the one and only unique institute in the country which addresses the issue of research, development and extension of Island's agri/horti/animal/fish sectors on 23rd June 1978. He greeted all the staff members of the institute on this auspicious occasion and expressed his gratitude for their dedication, devotion and commendable contribution for taking this institute to its new heights. He lauded the efforts of the scientists for development of suitable varieties, breeds and technologies for enhancing the productivity in sustainable manner. He further stressed that, the future plan of our institute will be to work on post-harvest and value addition, technology commercialization, technology fortification and up scaling to reach to the all the farmers and stakeholder to achieve the goal of doubling farmers income and to become atmanirbhar. The progamme ended with

vote of thanks proposed by Shri D. Karunakaran.

b) International Yoga day

The staff of ICAR-CIARI, Port Blair celebrated the International Day of Yoga(IDY), 2021 on 21st June, 2021 at 7.00 A.M at their respective home with their families with the message "Be with Yoga, Be at Home".

c) World Bee day-2021

ICAR-KVK, Sippighat, South Andaman and Nimbudera, North & Middle Andaman organized a one-day webinar on World Bee Day with the theme "Build Back Better for Bees" on 20th May, 2021. During the programme role of honeybees in increasing agricultural productivity, beekeeping as an economic enterprise, production and processing of honey, income from by-products of beekeeping and honey for health were discussed. A total of twelve farmers and KVK staff participated in the program.

d) World Milk Day-2021

ICAR-KVK, South Andaman, celebrated World Milk Day through conducting an online e-Goshthi with the dairy farmers on 1st June 2021, wherein a total of 16 farmers and staff of ICAR-KVK, South Andaman participated and benefitted from the same. Further, ICAR-KVK, North and Middle Andaman celebrated by organizing webinar cum e-Gosthi on the theme “Animal Health and Productivity”. During the programme nutritional value of milk and its role in fighting the malnutrition, economic benefits of the dairy farming, production of quality milk products, breeding, feeding and health care management of dairy cattle were discussed. A total of seventeen participants joined the online program through Google meet.

7. Kisan Gosthi

- ICAR-KVK, Port Blair organized Kisan Gosthi in virtual mode on balanced use of fertilizers to create awareness to the farming community on 18th June 2021. The team of KVK interacted with the farming community of Islands and gave special emphasis on the role of fertilizers in supply plant essential nutrients, the importance of soil testing in the balanced use of fertilizers, judicious use of fertilizers using the 4 R approach, importance of organic fertilizers (compost, bio-fertilizers, etc.), soil health card scheme, drip fertigation, crop residue management, etc., In this event, 19 participants (16 male and 3 female) were benefited.

- ICAR-KVK, Port Blair & N & M Andaman conducted Kisan Gosthi at Dharmapur village, Rangat, N & M Andaman, on 07th April 2021. The farming community of the village shared their problems related to lack of veterinary medicines and other agricultural inputs such as quality seeds and planting materials, summer moisture stress, etc. The subject matter Specialist of Agronomy, Home Science, Horticulture, Animal Science, and Agricultural engineering has given solutions to their problems. A total of 14 farmers and farmers participated in the programme.

8. Field Day

Field Day on Seed production of open pollinated brinjal varieties was conducted at Bloomsdale Research Farm on 17th April, 2021, wherein a total of 25 farmers (19 Male & 6 female) were participated.

9. Infrastructure development

a) Small equipments like Flake ice machine, Cabinet Fish Dryer, Hot air Oven and Homogenizer for fish processing and value addition laboratory were purchased and installed in laboratory. Beside, Infrastructure for operation of fish processing laboratory was established.

b) A new shade net house of 150 m^2 was created at Garacharma farm under the DBT funded project on "Micropropagation, agro-techniques standardization and utilization of Woody Pepper (*Piper pendulispicum* C. DC.): a novel spice from Andaman Islands.

10. Deputation abroad/PG studies/HRD

As part of the Phase –III training, Mrs. Shannon N Sangma underwent three months training program (April-June, 2021). She has done soil survey and evaluation study at 1: 4,000 in lower Gangetic delta and coastal plains in Majherpara village of Canning II block of South 24 Parganas district, West Bengal.

11. Mera Gaon Mera Gaurav

a) The team from NRM issued advisories through print and electronic media for the allotted MGMG villages on moisture stress management in plantation crops and efficient use of irrigation water in vegetables.

b) Dr. Ajit A. Waman visited two farmer's fields in Dundas Point and distributed saplings of lemon grass (20 nos.) and Burmese coriander (260 nos.) along with seeds of these crops. Farmers were also guided about CIARI-ProDhaniya Multi technique for cultivation of culantro and spices in their farms.

12. TV Talk

Resource Person	Topic	Date
Pooja Bohra	Immunity boosting plants in home gardening	15/04/2021
Ajit A. Waman	Scientific postharvest management of spices (Live)	29/04/2021

13. Awards/ Honours

Dr. Ajit A. Waman delivered a talk as Invited Speaker in the Virtual symposium entitled "Beyond Chemistry: Consumer Acceptance of Flavor, Food Safety and Health Benefits of Fruits and Vegetables", organized by American Chemical Society held at the Spring 2021 ACS National Meeting & Exposition, from 5th-16thApril, 2021, San Antonio, Texas.

14. Publications

Research Paper

- De AK, Sawhney S, Ponraj P, Sunder J, Banik S, Bhattacharya D. (2021). Physiological and immune responses to long road transportation in Andaman local pigs. *Tropical Animal Health and Production*, 5, 53 (2):247. doi: 10.1007/s11250-021-02692-5. PMID: 33821397.

- Jaisankar, I., B. Augustine Jerard and E. Manassehn Moses (2021). Impact of growing media on seedling growth and production in Andaman Padauk (*Pterocarpus dalbergioides* Roxb.) *Indian Forester,* 147 (5): 455 – 460, DOI: 10.36808/if/2021/vl47i5/152374.
- Lal S.V., N. Anand Laxmi., Y. Ramakrishna., and Augustine Jerard (2021). Impact of Krishi Vigyan Kendra training on knowledge gain and farmers adoption behavior. *Acta Scientific Veterinary Sciences,* 3.6: 20-24.
- Lal S.V., Ramakrishna Y., Sujatha T., Jai Sunder., Kasinath B.L & Chakurkar E.B. (2021). Intervention of KVK in animal husbandry results increased farm income and livelihood of North and Middle Andaman farmers. *Agro Science Today*, 2(5), 0149-0153.
- Bohra, P. Waman, A.A. and Devi, R.K. (2021). Seed fatty acid composition and germination studies in *Garcinia dhanikhariensis* S. K. Srivastava (Clusiaceae) – a novel tropical fruit species from Bay Islands, India. *International Journal of Fruit Science*, DOI:10.1080/15538362.2021.1951921
- Bohra, P. Waman, A.A., Kumar, S.S. and Devi, H.L.(2021). Morphological and physicochemical studies in blood fruit (*Haematocarpusvalidus* Bakh. f. ex Forman): A tropical fruit and natural colorant. *South African Journal of Botany* https://doi.org/10.1016/j.sajb.2021.05.002.
- Saravanan, K., Sivaramakrishnan, T., Praveenraj, J., Kiruba Sankar, R., Haridas, H., Kumar, S. and Varghese, B (2021). Effects of single and multi-strain probiotics on the growth, hemato-immunological, enzymatic activity, gut morphology and disease resistance in *Rohu, Labeorohita*. *Aquaculture*, 540: 736749.
- Thanmai Paul., Meena, B.L., Bommayasamy, N., Shailesh Kumar, Kasinath, B.L., Basantia, D (2021). Maudamani rice cultivar performed better under natural farming condition in Andaman & Nicobar Islands. *Journal of Krishi Vigyan*, 9(1):147-150.
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Book

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15. Retirements / New Entrants / Transfer/Promotion

New Entrants

- Dr. Eaknath B Chakurkar joined as Director, ICAR-CIARI on 28th April 2021.

Retirement

- Shri M.S.R.C. Murthy, LDC on 31st June, 2021

Transfer

➢ Dr. Pooja Kapoor, Subject Matter Specialist (Home Science) transferred from ICAR-KVK, Nimbudera to ICAR-KVK, Port Blair on 15th April, 2021.

➢ Dr. Zachariah George, Subject Matter Specialist (Animal Science), transferred from ICAR-KVK, Nicobar to ICAR-KVK, Port Blair on 16th April, 2021.

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