



संवादपत्र NEWSLETTER

भाकृअनुप - केंद्रीय तटीय कृषि अनुसंधान संस्थान

(भारतीय कृषि अनुसंधान परिषद)

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हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

In this issue

Research Highlights

- Turmeric intercropping in coconut plantations on sloping lands of Goa
- Morphological and molecular characterization of rice germplasm collections
- Identification of novel seedling stage salinity tolerant genotypes in rice
- Coconut genetic resources of Goa
- Host range and natural enemies of rugose spiralling whitefly in coconut based cropping system
- Isolation and identification of

Major Events

- World Coconut Day
- Tourism Expo 2019
- स्वच्छताहीसेवा' परखवाडा कार्यक्रम का समारोप
- Training programme on ornamental fish breeding and culture
- Rice field day organized at Gaodongrim village, Canacona
- Training programme on ornamental fish breeding and culture

Published by :

Dr. E. B. Chakurkar, Director (Acting),
ICAR-CCARI,
Old Goa, Goa, India - 403 402,

Phones : (0832)-2285381, 2284678, 2284679

Fax : (0832)-2285649

E-mail : director.ccari@icar.gov.in

website : www.ccari.res.in

Editorial Committee :

Dr. S. Priya Devi, Principal Scientist

Dr. Manohara KK, Senior Scientist

Dr. Susitha Rajkumar, Scientist

Dr. Bappa Das, Scientist

Dr. Sujeet Desai, Scientist

Compilation & Technical Assistance:

Smt. Pranjali Ninad Wadekar, Technical Officer

Digitally Printed at:

ICAR-CCARI, Old Goa

Director's Desk



The Western Ghats are the second most prone areas to severe landslides after the Himalayas. One of the important features of this region is the geography; with short river lengths and high elevation difference between high and low lands. Secondly, high intensity rainfall for short duration in this region leads to soil and water erosion, which results in landslides in the hills, and floods in the low lying areas. On 8th August 2019, due to heavy rainfall in the monsoon season, severe landslides and floods affected the state of Kerala. A massive landslide occurred in the state at Puthumala near Meppadi and floods in the low lying areas of Thirunelly in the Wayanad district.

In order to study the impact of landslides and floods on agriculture and livestock component of Wayanad, a multi-disciplinary team of scientists from Natural Resource Management, Horticulture, Crop Science and Animal Sciences from ICAR-CCARI, Goa was deputed. The team of scientists visited Wayanad district on 3rd and 4th of October, 2019. During the two days, different government organisations like, Coffee Board Regional Research Station, Division of Soil and Water Conservation, Wayanad Collectorate, Agricultural College and Research Institute, Ambalavayal, Krishi Vigyan Kendra, Wayanad and major NGO's in the district like MS Swaminathan Research Foundation (MSSRF) and National Rural Livelihood Mission (NRLM) were visited. The causes of the disaster, the losses that had occurred and the mitigation measures envisaged by each one of the body were deliberated upon during the discussions held with the officials of different organizations.

The major causes for the landslides in the district was due to sudden cloud burst, with more than 500 mm rainfall within 24 hours. The anthropogenic reasons like constructions of buildings, cutting of forests for tea, coffee and cardamom plantations on hill slopes, mining and quarrying etc has lead to disintegration of soil which resulted into a massive landslide. In the low lying areas of Thirunelly in Wayanad district main problem was floods, inundation of paddy fields due to overflowing of the adjacent stream and the deposition of sand which resulted in crop loss. There was loss of human life, cattle, properties, agricultural lands, feed and fodder stock etc. After the visits and discussion with different officials, alternate livelihood sources in landslide areas such as mushroom cultivation, small scale integrated units with poultry, fishery and vegetables for small and marginal farmers were recommended. To protect the animals, community animal sheds to rehabilitate livestock and establishment of composite feed block units to deal with fodder scarcity during calamities were recommended.

RESEARCH HIGHLIGHTS

Turmeric intercropping in coconut plantations on sloping lands of Goa

(Sujeet Desai and AR Desai)

Turmeric (*Curcuma Longa*) is a profitable spice crop as it is used as condiment, medicine and cosmetics. Even though coconut is an important plantation crop in the coastal regions, the land is not effectively utilized by coconut roots and can support many more crops. Inter row space in coconut could be utilized for raising profitable crops like turmeric. A study was carried out to evaluate the performance of turmeric (var. Pragati) as an intercrop in coconut plantations on 14% sloping land in lateritic soil. The experiment consisted of three treatments viz., circular trenching, circular terracing and control treatment. The runoff and soil loss data from coconut plots under three treatments were recorded with turmeric intercrop (2018) and compared with the previous year (2017) data

without intercrop. The runoff under circular trenching, circular terracing and control treatment reduced to 430, 582 and 667mm in 2018 as compared to 573, 677 and 776mm in 2017. Similarly, soil loss under circular trenching, circular terracing and control treatment reduced to 53, 56 and 82 kg/ha in 2018 as compared to 74, 88 and 116 kg/ha in 2017. Average yield of turmeric from three plots ranged from 27 t/ha to 33 t/ha, whereas the number of mother rhizomes, primary and secondary rhizomes ranged from 2 to 3, 7 to 8 and 8 to 10, respectively. Turmeric can be a good intercrop in coconut especially on sloping lands as it reduces the runoff and soil loss and provides additional income to the farmers.



Turmeric intercrop in coconut plantation



Freshly harvested turmeric rhizomes

Morphological and molecular characterization of rice germplasm collections

(Manohara KK)

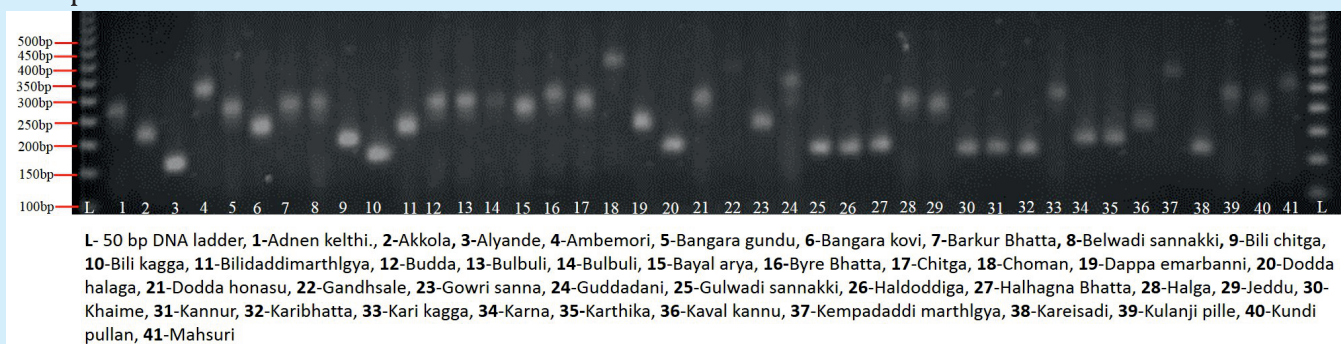
Morphological and molecular characterization of 153 rice germplasm collections comprising of landraces and wild relatives from Goa state and from two districts viz., Uttara Kannada and Shimoga in Karnataka state was carried out during Kharif 2019. The descriptive statistics showed wide variability for the studied traits. Days to maturity ranges from 119 days (Bharani) to 179 (Kempadaddi marthlgya). Genotype

Bharani was shortest (80 cm) and genotype Kari Jaddu Bhatta was tallest (208.33 cm). Panicle length ranged from 17.20 cm (GWR 013) to 36.67 cm (Mara bhatta). Wild rice GWR 013 had the lowest number of filled grains per panicle (19.67) whereas genotype kannatumba (344) had highest grains per panicle. Genotype Shahiram had the lowest seed weight with 100 seed weight of 1.45 g whereas the genotype Adnen kelthi had the



highest seed weight of 3.27 g for 100 seeds. Grain yield was highest in the genotype Giddu bhatta (28.54 g/plant) followed by Mysore sanna and Kannur whereas lowest grain yield of 2.55 g/plant was recorded in wild rice GWR 002-1. For molecular characterization, 34 SSR markers covering all the 12 linkage groups were utilized. Except for four markers all other markers were

found to be polymorphic. Marker RM10871 produced maximum alleles (19) followed by RM474 (10) and RM3867, RM333 and RM 180 with eight alleles each. PIC was highest in RM10871(0.92) followed by RM474 (0.83) and RM206 (0.82). 153 genotypes were clustered into four groups with each group further divided into two sub-clusters.



Allelic profile of the SSR marker RM10871 in rice landraces

Identification of novel seedling stage salinity tolerant genotypes in rice

(Manohara KK)

Screening of the germplasm collections in rice was repeated for the second year in Kharif 2019 to identify promising lines tolerant for seedling stage salinity stress. Phenotyping was carried out under microplot at induced salinity stress of 12 dS/M. The genotypes viz., Korgut, Kagga, KS 4,

KS 19-2, KS 17, Goa Dhan 2, GWR 005 were found to be tolerant to salinity stress at seedling stage with SES scoring of ~ 3, while genotypes viz., Shidde, Xitto, Burma, Akkala, Goa dhan 1, Damgo, Halaga were found to be moderately tolerant with SES scoring of ~5.

Coconut genetic resources of Goa

(V Arunachalam)

Goa state possesses rich biodiversity and heritage of coconut crop. Three cultivars of Goa namely Benaullim, Calangute and Nadora are documented and currently conserved at national / state-level agencies. During the current year, typical populations representing tall coconut populations of Calangute, Rivona, Gaodongri and Canacona, native to Goa state were identified for

further studies. About 220 coconut seed nuts of Benaullim and 280 coconut seed nuts of Calangute were sent to ICAR-Krishi Vigyan Kendra, Puri (Orissa University of Agriculture and Technology) at Sakhigopal, Odisha for distribution to coconut farmers during November 2019 for evaluation of the two popular Goan coconut populations in east coast.





Isolation and identification of entomopathogenic fungus *Isariatenuipes* (Maruthadurai R and R Ramesh)

The natural epizootics of rice skipper (*Pelopidas mathias*) larvae and pupae caused by entomopathogenic fungus was recorded during October 2019 at Netravali, South Goa. The fungus isolated from rice skipper larvae and pupae was identified as *Isariatenuipes* (*Paecilomycestenuipes*) through molecular techniques. Entomopathogenic fungus *I. tenuipes* can infect larval and pupal stages of lepidopteran insects when the environmental conditions are suitable. Rice skipper pupae were found to be more susceptible to *I. tenuipes* than the larvae. An average of 3.56 infected pupae/m² was recorded against 0.34 infected larvae/m². The fungus emerged from the dead cadaver of rice skipper larvae, pupae and produced very conspicuous fruiting bodies and conidia. The identified fungus

has shown pathogenicity in lepidopteran larvae under *in vitro* condition and can be used as effective biopesticide against lepidopteran insects.



Fungus infected pupae and larvae of rice skipper

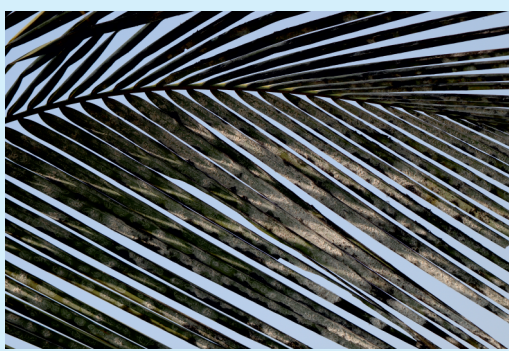


Host range and natural enemies of rugose spiralling whitefly in coconut based cropping system

(Maruthadurai R and R Ramesh)

Rugose spiralling whitefly (RSW), *Aleurodicus rugioperculatus* is an invasive insect pest. Field studies were carried in different coconut plantations viz., Nuveum, Goa-Velha, Mapusa, Mordol, Valpoi and Old Goa to record the status, host range and their natural enemies. Moderate to severe incidence of RSW was recorded in different coconut plantations.

Besides coconut, RSW infestation and its colonies were recorded on banana, all spices, triandra palm, areca nut, soar sop, guava, mango, black pepper, heliconia, papaya, citrus, avocado, chafa, indian shot and maize. The predominant natural enemies found feeding this whitefly was predator *Mallada boninensis* Okamoto and parasitoid *Encarsia guadeloupae* Viggiani.



Whitefly affected leaf



Parasitoid *Encarsia guadeloupae*

Addressing summer anestrus in buffaloes through hormonal interventions

(Gokuldas PP and EB Chakurkar)

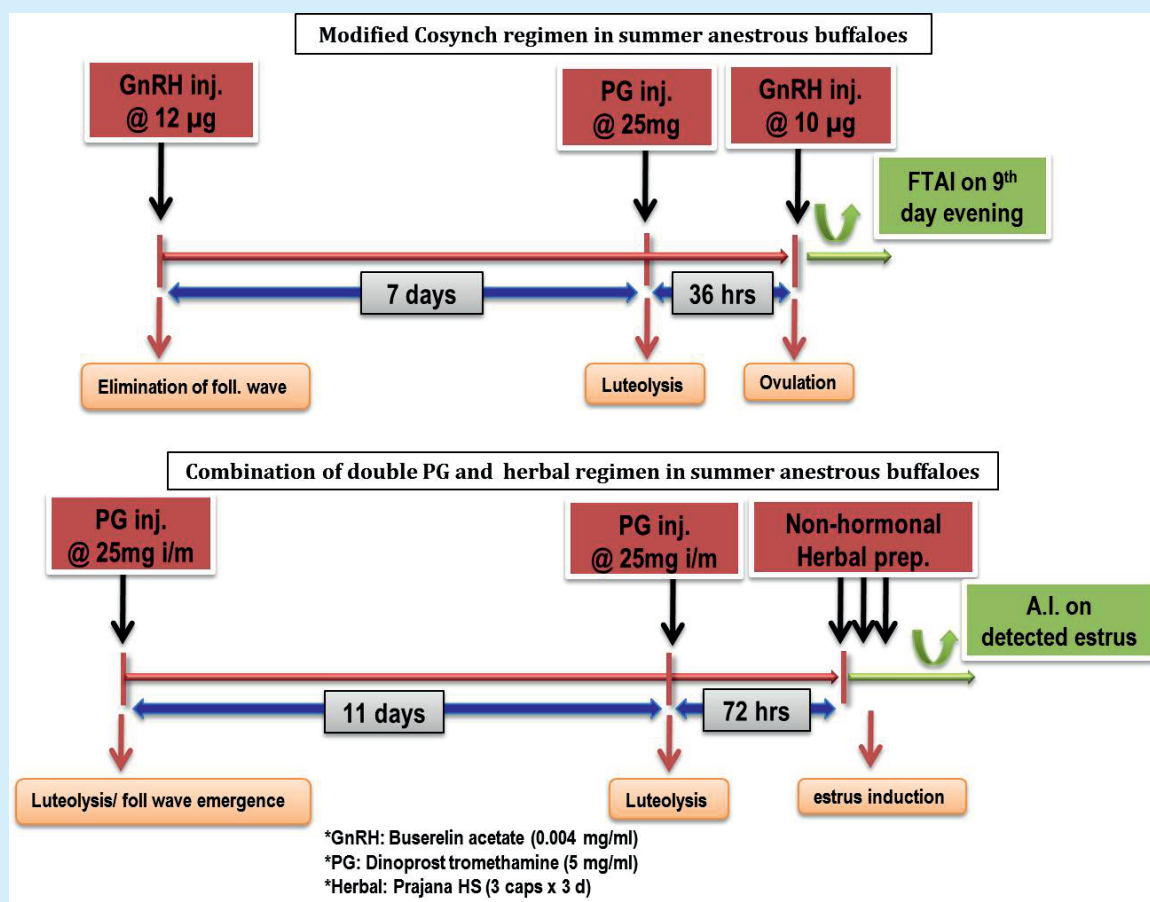
Dairy buffaloes have inherent problems of summer infertility like anestrus, poor estrus expression and subestrus all leading to sub-optimal reproductive efficiency. These disorders have also been recorded in buffaloes reared under hot and humid coastal climate. Estrus induction protocols using exogenous hormones have been attempted with variable success rates in dairy animals. An experimental trial was carried out to compare the efficacy of different hormonal regimens for estrus induction and

synchronization during summer in Murrah buffaloes reared under coastal climate. Modified Cosynch, double prostaglandin (PG) and herbal combination regimens were evaluated. Results were satisfactory for both the regimens, nevertheless double PG treatment coupled with herbal regimen was found to be more effective in inducing estrus and enhancing estrus expression in summer anestrus buffaloes with significantly ($p < 0.05$) higher initial estrus induction rate (83.33%) than modified Cosynch protocol (71.43%).



Comparison of different estrus synchronization regimens in summer anestrus buffaloes

	Modified Cosynch regimen	Combined Double PG Herbal regimen	Overall
Initial Estrus induction rate (%)	71.43 ^a	83.33 ^b	78.57
Overall estrus induction (%)	71.43 ^a	100.0 ^b	85.72
% non-responders	28.57 ^a	16.67 ^b	40.00
% repeat breeding	42.86 ^a	28.57 ^b	35.71
Treatment to estrus Interval (h)	44.5 ^a	20.0 ^b	37.5



NEW INITIATIVES

Integration of Colour Doppler ultrasonographic imaging technology in reproductive management of buffaloes

(Gokuldas PP, Bappa Das and EB Chakurkar)

Colour Doppler Ultrasonography or Colour Flow Imaging (CFI) is an advanced imaging technique that merges anatomical information derived from ultrasonic pulse-echo methods with velocity information obtained using ultrasonic Doppler technique to produce colour-coded maps of tissue velocity superimposed on grey-scale images of tissue anatomy. This non-invasive technology can be used to monitor and image the blood flow through organs like uterus, ovaries and blood vessels. Optimal Colour Flow Mapping (CFM) image data can be recorded for analysis and interpretation using standard image analysis

software. Different imaging parameters and ultrasound attributes of CFM were recently standardized and the technique has been integrated into the reproductive management of buffaloes maintained in the institute unit and found to be of great value in assessing ovarian perfusion and functional status of reproductive system. Availability of more reliable and advanced CFI system will be of use in research and in making management decisions based on accurate diagnosis of reproductive status of the breeding herd.



Colour Doppler Ultrasound Imaging system

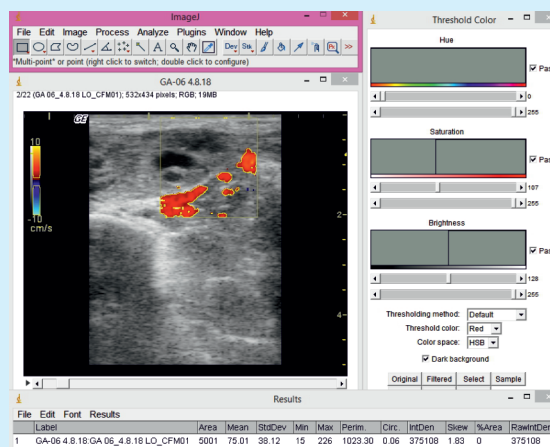


Image analysis of representative ultrasonogr Events

MAJOR EVENTS

World Coconut Day

World coconut day was celebrated on 11th and 12th September 2019 at ICAR-KVK, North Goa. Exhibition of coconut varieties and demonstration of seedling selection methods were carried out to the trainees of virgin coconut oil training programme. The demonstration of coconut climbing machine was also carried out during the two day event.



Tourism Expo 2019

The technologies developed by ICAR-CCARI, were displayed in the Tourism Expo organised by Goa Science Centre, Miramar, Goa, during 25th-27th September, 2019 at Goa Science Centre, exhibition hall. Quality planting materials and post-harvest products were made available for sale and different eco-tourism charts were displayed. The information on the technologies was explained to the visitors by Dr. Maneesha, S.R., Scientist (Fruit Science), Shri. Edward Crasta, Technical Officer, Mrs. Monica Singh, SMS (Extension), Shri. Vishwajeet Prajapati, Technical

Officer and Shri. Vinod Ubarhande, Farm superintendent.



'स्वच्छता ही सेवा' पखवाडा कार्यक्रम का समारोप

संस्थान में दिनांक ११ सप्टेंबर से ०३ अक्टूबर २०१९ तक स्वच्छ भारत अभियान के अंतर्गत 'स्वच्छता ही सेवा' पखवाडा कार्यक्रम का आयोजन किया गया। 'प्लास्टिक अपशिष्ट प्रबंधन' यह इस साल के स्वच्छता पखवाडे का मुख्य विषय था जिसमें मुख्यतः एक लउ पयोग प्लास्टिक के उपयोग को रोकने हेतु विविध जन जागृती कार्यक्रमों का आयोजन किया गया। इस विषय पर जगह-जगह पर ब्यानर लगवाये गये, संस्थान में एवं संस्थान के बाहर, ओल्ड गोवा परिसर, पर्यटन परिसर आदी जगहों पर प्लास्टिक कचरे की सफाई की गई, ओल्ड गोवा परिसरमें एक लउपयोग प्लास्टिक के उपयोग को रोकने हेतु एक जनजागृती रैली आयोजित की गई, ऑफिस परिसर में उपयोग होनेवाले एक लउपयोग प्लास्टिक का सर्वे किया गया और संस्थान के कुछ कर्मचारियों के लिये नारीयल के पत्तों से विविध चीजे बनाने का एक दिवसीय प्रशिक्षण कार्यक्रम आदी का आयोजन किया गया।

महात्मा गांधीजी के १५० वी जन्मशताब्दी पर ०२ अक्टूबर को श्रमदान और गांधीजी पर चित्रकला प्रतियोगिता का भी आयोजन किया गया। इन सभी कार्यक्रमों में संस्थान के कर्मचारीयों ने बढ-चढकर हिस्सा लिया। इस पखवाडे के

दौरान ओल्ड गोवा एजुकेशन इन्स्टीट्यूट के बच्चों के लिये स्कूल में निबंध लेखन प्रतियोगिता भी आयोजित की गई। ०३ अक्टूबर को 'स्वच्छता ही सेवा' पखवाडे के समारोप के अवसर पर मुख्य अतिथी श्री आशुतोष जोशी, प्रधान महालेखाकार, गोवा और संस्थान के निदेशक डॉ. ई. बी. चाकूरकर जीने अपने विचारों को प्रकट किया और सभी को मार्गदर्शन किया और सभी विजेताओं को एवं प्रतीभागीयों को पुरस्कार भी प्रदान किये। प्रशासकीय विभाग के साथ संस्थान के स्वच्छता समन्वयक श्री विनोद उबरहंडे (प्रक्षेत्रअधिक्षक) ने इस पखवाडे का सफलतापूर्वक नियोजन किया।



Front Line Demonstration on high-yielding upland rice variety 'Sahbhagi Dhan'

25 FLDs on high-yielding upland rice variety 'Sahbhagi dhan' was taken up at Gadongrim village covering 10 ha area during the Kharif 2019. Sahbhagi Dhan for the first time introduced in this remote village during the year 2012 for cultivation in upland areas. The variety has slowly replaced the traditional rice varieties viz., Jaya, Karjat 3 and Jyothi in upland areas and farmers

are happy with the performance of this variety and the quality of the rice. In the FLD plots during Kharif 2019, Sahbhagi Dhan recorded grain yield ranging from 4.5 t/ha to 5.3 t/ha compared to traditional variety like Karjat 3 which recorded 3.0 t /ha to 3.6 t/ha. Farmers are of the opinion that the cooked rice is very tasty and would like to continue Sahbhagi Dhan in large areas.



a



b

FLD on 'Sahbhagi Dhan' rice variety in farmers' field in a. Kavlem wada and b. Shristhal wada, Gadongrim village

Rice field day organized at Gadongrim village, Canacona

A field day was organized in Kavlem wada of Gadongrim village on rice variety Sahbhagi Dhan. The farmers were apprised about advantage of growing Sahbhagi Dhan over the traditional rice varieties in upland situation. In the FLD plots, Sahbhagi Dhan recorded grain yield ranging from 4.5 t/ha to 5.3 t/ha compared to traditional variety like Karjat 3 which recorded 3.0 t /ha to 3.6 t/ha. Farmers are of the opinion that the cooked rice is very tasty and would like to continue Sahbhagi Dhan in large areas.



Field day organized at the Kavlem wada, Gadongrim village



Training programme on ornamental fish breeding and culture

A three days training cum skill development programme on “Ornamental fish breeding and culture” was conducted at ICAR-CCARI, Old Goa which was organised by Fisheries Section, ICAR-CCARI on 17th, 31st August, and 30th September 2019. The training programme was attended by 75 participants (73 students of BSc. Zoology and 2 faculty) from Govt. College, Sanquelim, Goa (affiliated to Goa University). The training covered lectures on ornamental fisheries, breeding and culture, aquarium fabrication and disease management in ornamental fish culture. There were practical sessions on the handling of fish broodstock, breeding, fish seeds, aquarium fabrication, and disease treatment methods in the ornamental fish culture at the hatchery

facility of ICAR-CCARI. The training programme was coordinated by Dr. Sreekanth, G. B., Scientist (Fisheries Resource Management), Fisheries Section, ICAR-CCARI.



ICAR CCARI team visits Wayanad district to study the impact of landslides and floods

A multi-disciplinary team was constituted by Dr. E. B. Chakurkar, Director (A) to visit Wayanad district and study the impact of floods and landslides that occurred in second week of August 2019. The members were Dr. S. Priya Devi, Principal Scientist (Fruit Science), Dr. Manohara, K.K, Senior Scientist (Plant Breeding and Genetics), Dr. Susitha Rajkumar, Scientist (Veterinary Pathology), Dr. R. Maruthadurai, Scientist (Agricultural Entomology), Dr. Sujeet Desai, Scientist (Land and Water Management Engineering), and Dr. Nibedita Nayak, Scientist (Poultry Science). The team visited the district on 3rd and 4th of October 2019. The trip, visits and discussions were facilitated by Dr. Solomon Rajkumar, Scientist (Livestock Products Technology). During the two days, the team met officials from different Government organisations like Coffee Board regional research station and Division of Soil and Water Conservation, Wayanad Collectorate. Besides, the team also met researchers and extension

workers from Agricultural College and Research Institute, Ambalavayal and Krishi Vigyan Kendra, Wayanad. Major NGO organisations in the district like MS Swaminathan Research Foundation (MSSRF) and National Rural Livelihood Mission were also visited. During the discussions held with the officials, the causes of the disaster, the losses that had occurred and the mitigation measures envisaged by different organizations were deliberated upon. The major causes were reported to be sudden cloud burst (55 cm rainfall in 24 hours), anthropological reasons like constructions of buildings, cutting of forests for tea and coffee plantations in large stretches etc. There was loss of human life, cattle, properties, agricultural lands, feed and fodder stock etc.

The team visited Puthumala village, where the landslide had occurred wherein large mass of solid soil had filled up the deep valley. Team members interacted with the public / estate



workers who had lost their homes and got rehabilitated into relief camps. The last visit was to flood-affected lowlands adjoining the stream in Thirunelly. The main problem was inundation of paddy fields due to overflowing stream and the deposition of silt. At the time of visit, a portion of the field was reclaimed and replanted with fresh seedlings. The tribal farmers expressed their requirements for seeds of high-yielding varieties of paddy and vegetable, parboiling unit, weeders, mini power tillers, and training on value addition.

Based on the discussions with different officials and visits to different organizations, following recommendations were given:

- Proper action has to be taken to regulate the land development, construction and quarrying activities in landslide-prone areas.
- Recreation of first and second-order streams for diverting excess runoff from hill slopes.
- Stabilization of the slope by planting bamboo as it acts as a water harvesting body and reduces the soil piping effect. Planting of deep-rooted Ficus trees as the roots of ficus spreads and

holds the soil intact which reduces the disintegration of soil.

- Graded bunding across the hill slope to obstruct water flowing with high velocity and diverting it with safe velocity through diversion channels and grassed waterways.
- Construction of retaining walls and planting vegetative barriers to reduce erosion.
- Use of geotextile materials like geojute mats or coir mats while planting for stabilization of hill slopes.
- Introduction of climate-resilient crop varieties to cope up with biotic and abiotic stresses.
- Establishment of units for preparation of composite feed block to deal with fodder scarcity during calamities.
- Community animal sheds to rehabilitate livestock during calamities.
- Alternate livelihood sources such as mushroom cultivation, small scale integrated units with poultry, fishery and vegetables can be promoted for small and marginal farmers.



Distribution of planting material to SCSP beneficiaries

Planting materials of arecanut, grafts of jamun, aonla, sapota and nutmeg were distributed to farmers of Arisingere on 19th October 2019. The distribution programme was attended by Dr. E.B. Chakurkar, Director (A), Dr. Matahla J Gupta, SCSP Co-ordinator and Senior Scientist (Agricultural Structures and Process Engineering), Dr. S. Priya Devi, Principal Scientist (Horticulture) and Dr. Chethan Kumar, Scientist (Veterinary Public Health). In total 2402 plants, worth Rs.98,600/- were distributed to the farmers. Around 100 farmers participated during the programme. The local panch and sarpanch also graced the occasion. Besides planting material, bypass fat, mineral mixture, vegetable seed kit etc. were also distributed. After the function, dairy units and

Arecanut plantations intercropped with banana were visited. The team also visited a protected cultivation unit of coloured capsicum.



Consultancy training programme on scientific pig farming

A three-day consultancy training programme on scientific pig farming for progressive pig farmers was organized by the institute during 21st to 23rd October 2019. Ten progressive pig farmers from five different states viz., Maharashtra, Rajasthan, Haryana, Bihar and Karnataka participated in the programme. Dr. E.B. Chakurkar, Director (A) and course director of the programme opened the training session with introductory lecture on prospects of scientific pig farming. Dr. Gokuldas, P.P, Scientist (Animal Reproduction) and Dr. Sanjay Kumar Udharwar, SMS, ICAR-KVK, North Goa acted as training coordinators. During the training, the trainees were exposed to sessions on scientific rearing of pigs including boar semen processing and artificial insemination, scientific housing, feeding, health management strategies for pig farming. All the participants performed hands-on sessions on artificial insemination in pigs. Audio-visual sessions on relevant topics and field exposure visits to institute piggery units were

also organized. Overall, the training has contributed to capacity-building, entrepreneurship development in piggery and has also imparted much-needed knowledge on scientific pig farming to the pig farmers.



Vigilance awareness week

Institute has observed the vigilance awareness week from 28th October to 2nd November 2019 on the theme "Integrity a way of life". All the staff members actively participated in the awareness week and attended the rally. In this connection, pledge was taken by all staff members both in Hindi and English to eradicate corruption on 28th October. Banners were displayed at main locations of the campus to mark the vigilance awareness week. The institute organized a silent rally participated by regular and contractual staff near the Old Goa Church premises and approaching roads on the second day to sensitize the public about importance of vigilance awareness week and about curbing corruption in the society for betterment of the country. Staff

members of the institute distributed pamphlets in Hindi and English to the public. Social media platforms such as the official facebook and twitter pages of the institute, and informal WhatsApp group of ICAR-CCARI scientists were used to spread the message.



ICAR-CCARI, Goa signs MoU with KUFOS, Kerala for research studies and extension activities

Institute has signed MoU with Kerala University of Fisheries and Ocean Studies (KUFOS), Kochi, Kerala on 8th November 2019 to associate in academic and research studies. According to the agreement, Dr. E.B. Chakurkar, Director, ICAR-CCARI mentioned that students of KUFOS could use the research facilities at ICAR-CCARI in various fields of fisheries, environment and climate change studies. Moreover, the scientists of ICAR-CCARI will be the visiting faculties for KUFOS. In return, KUFOS will extend support to ICAR-CCARI to jointly organize research projects, seminars and symposia and training

programmes in the field of fisheries sector and other relevant disciplines. Dr. E.B. Chakurkar, Director, ICAR-CCARI and Dr. A. Ramachandran, Vice-Chancellor, KUFOS has jointly handed over the MoU in the presence of Dr. B. Manoj Kumar, Registrar, KUFOS and Dr. Sreekanth, G.B., Scientist (Fisheries Resource Management), ICAR-CCARI. Honorable vice-chancellor opined both institutions would jointly pursue research programmes on different topics related to ocean studies and climate change, which have impact on fisheries and fishermen community.



Visit of Dr. E. B. Chakurkar, Director (A) to Wayanad

Dr E. B. Chakurkar, Director (A), ICAR-CCARI, visited Wayanad, Kerala on November 9th and 10th, 2019 to present a lead paper on the “Livestock based integrated farming systems for doubling farmers income” during XI Kerala Veterinary Science congress held at Kerala Veterinary and Animal Sciences University, Pookode, Wayanad. During his visit, he also visited the “Gotra Mission” integrated farming centre exclusively maintained by the tribal women and unemployed youth. He also visited the modern two-tier piggery unit and dung drying unit located at the dairy farm complex of the university. He further discussed with the officials of KVASU for future collaboration and the possible signing of MoU for research and

education. On the sidelines of his visit, he also visited the flood and landslide affected areas of Wayannad as a part of mandated disaster mitigation of ICAR-CCARI.



Workshop on integrated farming system

A two-day workshop on integrated farming system was organised by ICAR-CCARI in collaboration with Department of Agriculture, Animal Husbandry and Fisheries on 16th -17th November 2019 at ICAR-KVK, North Goa. On the first day, a total of 100 progressive farmers from different parts of Goa and 80 officials from Agriculture, Animal Husbandry and Fisheries have actively participated in the workshop and field visits. Hon'ble Chief Minister, Govt of Goa Dr. Pramod Sawant and Shri. Chandrakant (Babu) Kavlekar, Hon'ble Dy. Chief Minister and Minister for Agriculture, Government of Goa along with Dr. E. B. Chakurkar, Director (ICAR-CCARI), Mr. Madhav Kelkar (Director, Department of Agriculture) and Dr. Santhosh Desai (Director, Department of Animal Husbandry and Veterinary Services) inaugurated the workshop with introductory preamble on scientific integrated farming system, its importance in doubling the farm income, advance technologies in livestock production and fisheries. During technical

session, Dr. E. B. Chakurkar highlighted the importance of integrated farming system and their relevance to Goa in doubling farmer's income. Dr. Paramesha, V., (local coordinator) emphasized the potential of integrated farming system in achieving sustainability and explained different IFS model developed by the ICAR-CCARI, Goa and their potential to meet the food and nutritional security of the farm family. Dr. S. Priya Devi gave a glimpse on processing and value addition in horticulture and spice cultivation. Dr. Mathala Juliet Gupta exposed the farmers to different post-harvest technologies, farm machineries and improved storage technologies available for farmers to reduce post-harvest losses. After the technical session, the panel discussion was held to know different schemes available with the department and interaction session was held between farmers and department officials. Three IFS models (Rice-based, plantation crop-based and coconut-based farming system)



standardised at ICAR-CCARI, Goa were shown to farmers. During the second day of workshop, field visits were held at ICAR-CCARI, Goa, farm of Major Shandilya at Madkai, farm of Shri Nilesh Velgekar, Betoda, Ponda and at Kodar farm, Ponda. The workshop was concluded in the evening after completing the field visits.



Konkani learning workshop

Agricultural Research Service Scientists Forum (ARSSF), Goa unit, had organized a workshop on 'Basic Konkani learning' for the scientists and staffs of the Institute from 18th-20th November 2019 in collaboration with Directorate of Official Language, Govt. of Goa. The programme was inaugurated by Dr. S. Priya Devi, president, ARSSF Goa unit in presence of Mr. Anil Sawant, Asst. Director, Directorate of Official Language, Govt. of Goa, Dr. Mathala Juliet Gupta, Joint Secretary of central ARSSF unit and resource person Dr. Kiran Budkuley. There were classes on history of Konkani language, vocabulary related to agriculture and allied sectors and framing of sentences to converse and transfer our

technologies to Goan farmers. Classes were taken by resource persons Dr. Kiran Budkuley and Mr. Anant Agni. All the scientists took part in the workshop and study materials were distributed to the participants.



Celebration of Constitution Day

Institute has celebrated the Indian Constitution Day or Samvidhan Divas on 26th November, 2019 to commemorate the 70th year of the adoption of the Constitution of India and to honour and acknowledge the contribution of the founding fathers of the constitution. An awareness campaign focused on Citizens' duties including fundamental duties as enshrined in the Indian Constitution was started to be carried out throughout the year. At the start of the campaign, the administrative officer read out the "Preamble to the Constitution" to the staff members. Dr. E. B. Chakurkar, Director (A) of the Institute emphasized that the constitution of India is the supreme law of India and the republic is

governed in terms of the constitution of India which was adopted by the Constituent Assembly on 26th November 1949 and came into force on 26th January 1950. Banners, posters and quotations of National and International Personalities were displayed at the venue.



Participation in AQUABE-2019 at KUFOS, Kochi

ICAR-CCARI participated in the International Conference on Aquatic Resources and Blue Economy, AQUABE-2019 organized by Kerala University of Fisheries and Ocean Studies, and Indian Ocean Rim Association (IORA), from 28th to 30th November 2019 at Kochi, Kerala. Dr. Sreekanth, G. B., Scientist (Fisheries Resource Management) and Mr Edward Crasta, Technical Officer have participated in the event and displayed various technologies, varieties, products, publications, research posters and charts. A total of 1500 researchers, farmers, students and entrepreneurs from various parts of the country visited the institution stall and the various exhibits were explained to the visitors. The dignitaries, Smt. J. Mercykutty Amma, Hon. Minister of Fisheries, Nomvuyo Nokwe, Secretary General of Indian Ocean Rim Association (IORA), and Dr A. Ramachandran, Vice Chancellor, KUFOS

visited the ICAR-CCARI stall and applauded the efforts of the institute in developing the rice varieties for salt-affected areas, cashew varieties for different landscape, value-added products from post-harvest remains, ornamental fish feed, integrated farming systems for coastal regions, and pig and cattle breeds for coastal region.



World Soil Day and Agricultural Education Day

ICAR – Central Coastal Agricultural Research Institute, Old Goa, Goa celebrated the 'World Soil Day' and the 'Agricultural Education Day' on 5th December 2019 at ICAR-KVK, North Goa, Old Goa. Prof. Varun Sahni, Honorable Vice-Chancellor, Goa University, Goa was the chief guest and Dr S. K. Singh, Director, CSIR – National Institute of Oceanography, Dona Paula, Goa was the guest of honor for the function. The programme was attended by farmers, school students, press and media, Zuari Agrochemical Pvt. Ltd., scientists, subject matter specialists and staffs of the Institute and KVK. Dr. E. B. Chakurkar, Director, ICAR-CCARI, Old Goa welcomed the chief guest, guest of honour and participants and apprised about the importance of celebrating the World Soil Day and Agricultural Education Day. He also briefed about the activities carried out by the Institute to create awareness about soils, soil

testing, soil test based fertilizer application, agricultural education, etc. As a part of the event, the farmers from different villages of the Goa state were given the soil health cards. Students of three different schools participated in an essay competition on 'How to attract youth in agriculture' to celebrate 'Agricultural Education Day'. Dr. S. K. Singh emphasized upon importance of soils in our lives and need of improving the carbon status of the soil. He also urged the scientists to take up initiatives on these research areas. Chief Guest of the function, Prof. Varun Sahni stressed upon initiative to work in direction to achieve the target as per the "Technology Vision 2035" developed by the Technology Information, Fore-casting and Assessment Council. The vision document identifies key challenges and



needs of India and describes its technology capability landscape in 2035. He urged the young minds and researchers upon technological interventions to achieve food and nutritional security. Technical session on "Soil testing and soil test based fertilizer application", a demonstration on preparation of Jeevamrut and its use' and a lecture on "Agricultural Education: Introduction and Opportunities" was organized.



Workshop on "Scope for Extending Cashew Plantations in Non-traditional Areas"

A workshop on 'Scope of extending cashew plantations in non-traditional areas' was organized at the Institute in collaboration with 'Association of Coastal Agricultural Research', on 23rd December 2019 under the Chairmanship of Dr. S. K. Chaudhari, ADG (SWM), NRM Division, ICAR, New Delhi. At the outset, Dr. A. R. Desai, Principal Scientist, welcomed the dignitaries and delegates representing different states viz. Maharashtra, Karnataka, Gujarat, Chhattisgarh and Madhya Pradesh, where cashew is expanding in no-traditional areas. Dr. E. B. Chakurkar, Director (A) gave his introductory remarks about the programme. Dr. S. K. Choudhary, ADG (NRM), ICAR, New Delhi gave his opening remarks about the workshop and its aim. Dr. P. M. Haldankar, Director of Research, Dr. BSKKV, Dapoli highlighted the role of non-traditional cashew growing areas in his special remarks followed by an overview of cashew cultivation in non-traditional area by Dr. A. R. Desai. Presentations were made on the present status, agro-climatic and edaphic factors, constraints and scope for future expansion of cashew in non-traditional areas by Dr. P. K. Nagare, Dean, Faculty of Horticulture, PDKV, Akola, Maharashtra, for non-traditional areas of Vidarbha, Maharashtra; Dr. Muralidharan, Head, Date Palm Research Station, Mundra for Gujarat; Dr. R. L. Raut for districts of Madhya Pradesh; Dr. L. G. Hiregoudaur from

ICAR-K. H. Patil KVK, for Gadag district of Karnataka; Dr. R. V. Hegde, Professor and Head, Department of Horticulture, UAS, Dharwad for Belgaum and Dharwad districts of Karnataka; Dr. Shrinivas with Dr. Ravindra Mulge for Bidar District of Karnataka; and Dr. Vishnuvardhan, ADR, CoH, Bengaluru and Dr. Laxmana from CRS, Ullal, Mangalore for cashew cultivation in southern Karnataka. The presentations were followed by the brain-storming open discussion involving all the delegates and the scientists of ICAR-CCARI, Goa for formulating the future road map for exploring the possibility of expanding the cashew cultivation in non-traditional areas in the country. The ADG, in his concluding remarks, pinpointed the issues to be considered while drawing the action plan recommendations of the workshop for submitting the same to the Director General, ICAR, New Delhi. The workshop ended with formal vote of thanks.



IPR Cell /ITMU Activities

Patent Filing

- First examination report for the patent application (No.3037/MUM/2015) titled Extender for preservation of boar semen has been issued by the Indian patent office on 27th November, 2019. Prior art literature and supporting documents were reviewed and final reply to First Examination Report was prepared for submission to Patent Office.
- Applicant names for the patent application entitled Unmanned Remote controlled Palm tree Harvesting Robot (with serial no.201721022813 filed by Goa University under ICAR extramural research project) were amended as Goa University and ICAR-Central Coastal Agricultural Research Institute. This was in pursuant to the deliberations between the Institute and Goa University and communication from IP&TM Unit New Delhi, suggesting necessary amendments in the name of applicants for the above-mentioned patent application resulting from ICAR extramural project.

Commercialization of technologies

- Techno-commercial assessment of two new Institute technologies viz. CCARI Bio-3 and CCARI Bio-4 was initiated during the period. Detailed information (Technology disclosure and Technology evaluation documents) for the technologies were assessed by Agrinnovate India Limited, New Delhi.
- Techno-commercial meeting with the officials of Agrinnovate India Limited, New Delhi was held through web-conferencing on 18th December, 2019 to discuss the prospects and scope for commercialization and techno-commercial assessment of the Institute technologies.



Techno-commercial meeting with Agrinnovate India officials

- Information on potential commercializable technologies developed and plant varieties released by this Institute were compiled and uploaded on ICAR-KRISHI portal, repository of technology developed by ICAR, New Delhi.
- Dr. Gokuldas P.P., IPR Cell Coordinator and Mrs. Anuradha Naik, R.A-IPR/NAIF Scheme participated in Vibrant Goa Global Expo and Summit 2019 on 17th October, 2019 held at Dr. Shyama Prasad Mukherjee indoor stadium, Taleigao Goa. Details of the commercialisable technologies developed by the Institute were shared with participants and entrepreneurs from Goa and Maharashtra States to explore the scope of technology commercialization.



Vibrant Goa Global Expo and Summit, 2019

- Necessary procedures like license fee payments were followed up with concerned agri-entrepreneurs for the previous year technology commercialization agreements.

Plant Varieties Released

- Two new plant variety release proposals for the release of promising Brinjal variety proposed as “Goa Brinjal-5 (27-7-2) and Goa Brinjal-6 (42-7-1)” developed by Dr. R. Ramesh, Principal Scientist, (Pt. Pathology) were submitted to State Variety Release Committee & Director, Directorate of Agriculture, Govt. of Goa on 4th October, 2019.

Material Transfer Agreement (MTA) signed:

- Material Transfer Agreement (MTA) for procurement of the plasmid genetic material (Ref. No. 42875 pCRISPR, 42876 pCas9, and 62225 pCas) for research purpose from Addgene (non-profit repository for plasmids).

Meetings / Programmes Attended:

- IPR Cell Co-ordinator participated in a meeting organized by Goa State Council of Science and Technology under the chairmanship of Mr Levinson Martins, Director/Jt. Sec S&T, along with members of Khola/Canacona Chilli Cultivators Group, South Goa held at Pt. Deen Dayal Bhavan, Porvorim Goa on 17th October, 2019. Meeting was convened to discuss future course of action for promoting and branding Khola Chilli as GI Produce.



Meeting with the officials of Goa State Council of Science and Technology



Conference/Symposia/Workshop/Training attended:

Date	Name of the Scientist	Program	Venue
13th-14th September 2019	Dr. Nibedita Nayak	Annual review meeting of AICRP and PSP	College of Poultry Production and Management, Hosur, T.N.
16th-20th September 2019	Dr. Solomon Rajkumar Dr. Susitha Rajkumar	21 st World Veterinary Poultry Association Congress (WVPAC 2019)	BITEC, Bangkok, Thailand
17th October 2019	Dr. Gokuldas PP	Vibrant Goa-Global Expo and Summit	SPM Stadium, Goa University, Taleigao
31st October-1st November 2019	Dr. V. Arunachalam	Training workshop of Vigilance Officers of ICAR institutes	ICAR-NAARM Hyderabad
17th November 2019	Dr. Maruthadurai R	National Conference on Trends in Higher Education, Taxonomy, Agriculture, Biotechnology and Toxicology	Chennai
18th-21st November 2019	All scientists	Konkani Learning Workshop	ICAR-CCARI, Old Goa
1st-2nd December 2019	Dr. Susitha Rajkumar	27 th Annual Review Meet of AICRP-ADMAS	ICAR-NIVEDI, Bengaluru
10th-13th December 2019	Dr. Nibedita Nayak	XXXVI Annual Conference of Indian Poultry Science Association on "Conceptual understanding and future strategies for welfare friendly poultry	CGKVAH, Durg, Chhattisgarh



Lectures delivered:

Date	Name of Scientist	Title	Venue
18-10-2019	Dr. Gokuldas PP Scientist	Ultrasonography in goats- Training on scientific management of Goats	ICAR-KVK, North Goa
21-10-2019	Dr. Gokuldas PP Scientist	Basic requirements for A.I technology and procedure of A.I. in swine - Training on Scientific pig farming	ICAR-CCARI, Old Goa
17-10-2019	Dr. Susitha Rajkumar	Vaccination and Deworming in Goats	ICAR-KVK, North Goa
17-11-2019	Dr. Susitha Rajkumar	Avian health care management (bacterial, viral, fungal diseases)	ICAR-KVK, North Goa

Promotion

Sl. No.	Name/designation of the Scientists	Promoted to.	Effective date of placement/ promotion
1	Dr. Shivasharanappa.	Senior Scientist	15-12-2018
2.	Smt. Pratibha Sawant, Assistant	Assistant Administrative Officer	03-09-2019
3.	Shri Vinod D Pagi, UDC	Assistant	23-09-2019



Awards

- Dr. Maruthadurai, R., young Scientist Award by Dr. B. Vasantharaj David Foundation in National Conference on Trends in Higher Education, Taxonomy, Agriculture, Biotechnology and Toxicology during 17th November 2019 at Chennai.
- Dr. Nibedita Nayak. Best Poster presentation (Second prize) in IPSACON-2019 held at C.V.Sc. & A.H, Anjora, Durg, Chhattisgarh during 10th-13th December 2019.
- Dr. Sreekant, G. B., Best paper award in International Conference on Aquatic resources and Blue economy, AQUABE-2019 organised by KUFOS, Kochi, Kerala during 28th to 30 November 2019.

Transfer to ICAR-CCARI

- Dr. Amiya Ranjan Sahu, Scientist (Animal Genetics and Breeding) joined at ICAR-CCARI, Goa on 02-12-2019 transferred from ICAR-National Research Centre on Pig, Guwahati.
- Shri Trivesh Suresh Mayekar, Scientist (Fish Genetics and Breeding) joined at ICAR-CCARI, Goa on 09-12-2019 transferred from ICAR-National Bureau of Fish Genetic Resources, Lucknow.

Foreign Deputation

- Dr. Solomon Rajkumar, Scientist (Livestock Products Technology), ICAR-CCARI, Old Goa, Goa participated in the 21st World Veterinary Poultry Association Congress (WVPAC 2019) held at Bangkok, Thailand during 16-09-2019 to 20-09-2019.
- Dr. Susitha Rajkumar, Scientist (Veterinary Pathology), ICAR-CCARI, Old Goa, Goa participated in the 21st World Veterinary Poultry Association Congress (WVPAC 2019) held at Bangkok, Thailand during 16-09-2019 to 20-09-2019.
- Dr. Gopal Ramdas Mahajan, Scientist (Soil Science), ICAR-CCARI, Old Goa, Goa participated in a Training Programme on "Environmental Management" organized by Galilee International Management Institute (GIMI), Israel between 10-09-2019 to 23-09-2019.

