संवादपत्र
NEWSLETTER

भाकृअनुप– केंद्रीय तटीय कृषि अनुसंधान संस्थान
(भारतीय कृषि अनुसंधान परिषद)
ICAR-Central Coastal Agricultural Research Institute
(Indian Council of Agricultural Research)

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

Agrisearch with a human touch

In this issue

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Dr. TRILOCHAN MOHAPATRA *takes charge as Secretary, DARE and Director General, ICAR*

It is our pride to complement Dr. Trilochan Mohapatra on taking up the charge of Secretary, Department of Agricultural Research and Education and Director General, Indian Council of Agricultural Research, New Delhi on 22nd February, 2016. Dr. Mohapatra was holding the esteemed position of Director-cum-Vice Chancellor of the prestigious ICAR-Indian Agricultural Research Institute, New Delhi. Prior to this, he worked as the Director of ICAR-National Rice Research Institute (formerly ICAR-Central Rice Research Institute), Cuttack, Odisha. He served National Research Centre on Plant Biotechnology, ICAR-IARI, New Delhi as researcher and teacher for about 20 years.

He has received advanced training in sequencing and physical mapping of rice genome from foreign universities of international repute. He is a scientist of global repute working in the area of molecular genetics and genomics. Dr. Mohapatra has over 145 research papers in national and international journals of repute and several book chapters. His research accomplishments include development of the first high yielding Basmati rice variety resistant to bacterial leaf blight through molecular marker assisted selection, and physical mapping and genome sequencing of rice and tomato. He is a recipient of several fellowships and prestigoiuos awards for his remarkable contributions in the field of Agricultural sciences. He has received INSA Young Scientist Award, NAAS Tata Young Scientist Award, Dr. BP Pal Memorial Award of ICAR-IARI and many more. He is a Fellow of the Indian National Science Academy, National Academy of Sciences-India, Allahabad and the National Academy of Agricultural Sciences, New Delhi. We are sure that the ICAR will touch the new heights under his dynamic leadership and wish him a great success in all endeavours.

RESEARCH HIGHLIGHTS

Salinity tolerant microorganism for plant growth promotion in rice under coastal saline soils

(GR Mahajan and R Ramesh)

Two salinity tolerant microbes as alone and consortia were tested for plant growth promotion in rice. Application of one of the two microorganisms, *Bacillus methylotrophicus* Strain STC-4, either as alone or in combination with farmyard manure caused significantly higher ($p<0.05$) root length, volume and weight and straw weight (dry) over all the treatments. The corresponding values of these parameter in farmyard treated pots were 21 cm, 46.4 mL, 38.8 g/pot, 39.1 g/pot. Application of microorganisms did not bring any significant changes in the soil pH and electrical conductivity. Positive effect of this strain was also recorded on soil biological activity - soil enzymes, soil microbial biomass carbon, microbial biomass as fraction of soil organic carbon and basal soil respiration when applied with farmyard manure. The

beneficial effect of the application of microorganism along with organic manure indicates the possibility for plant growth promotion under field condition.

Carbon sequestration and microbial activity after long term adoption of soil and water conservation measures in high density cashew

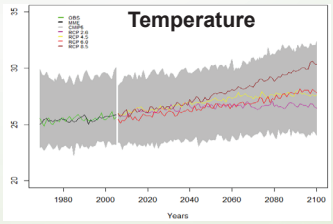
(GR Mahajan)

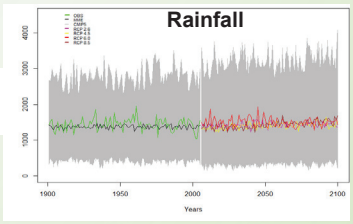
Effect of long term adoption (13 year) of soil and water conservation measures on the carbon sequestration and microbial activity in cashew (4×4 m) was studied. The soil and water conservation measure, continuous contour trench + *Stylosanthes scabra* + *Vetiveria zizanoides* (CCT+SC+VB), sequestered 6.59 Mg ha^{-1} carbon up to 0-0.90 m depth. This indicates a huge potential of using the soil and water conservation measures to capture the atmospheric carbon into soil. Besides carbon sequestration, the CCT+SC+VB also caused highest soil microbial biomass carbon of 39.2 µg g-1 soil compared to other measures. This explains the positive effect of the soil and water conservation measures on the microbial activity.

Development of climate change scenarios for Western Ghats

(Bappa Das)

Multi-Model Ensemble (MME9, MME8 for temperature and rainfall, respectively) from the best performing CMIP-5 models for both past and future time period (1969-2100 and 1901-2100 for temperature and rainfall, respectively) have been developed for Western Ghats. MME9 indicates that temperature is projected to be increased in the range 4.19-9.31% for different RCPs in the period of 2006-2100 with respect to the base period of 1970-2000 (RCP2.6=4.19, RCP4.5= 6.36, RCP6.0= 4.72 and RCP8.5= 9.31 %). The multi-model ensemble for rainfall (MME8) indicated a very marginal increase in rainfall in RCP2.6 and RCP6.0 but it will decrease according to RCP4.5 and RCP8.5 (-0.78, -2.35, 4.99 and 0.01 % for RCP2.6, RCP4.5, RCP6.0 and RCP8.5, respectively). In general, future temperature may increase which may increase the plant water requirement through increasing evapotranspiration. But rainfall may not increase significantly. So rainfed agriculture in the study region may face acute water crises in future.





Statistical crop weather model for pre-harvest forecast of rice yield for Goa

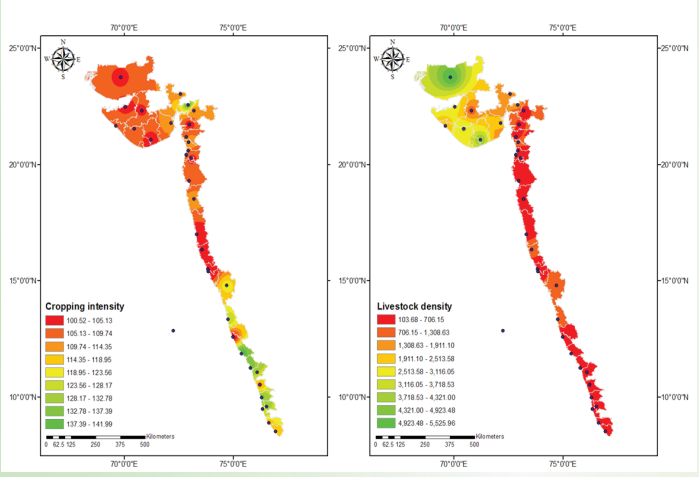
(Bappa Das and Viswanatha Reddy K)

Long period data series of weather parameters were collected from Agromet observatory, ICAR-CCARI, Goa. Corresponding rice yield data of that period for Goa were collected from the website of Directorate of Economics and Statistics. For development of district level yield forecast models, weather indices were generated using weekly cumulative value for rainfall and weekly average value for other parameters like maximum and minimum temperature, morning, evening relative humidity, bright sunshine hours etc. These weather indices were then regressed with rice yield to develop pre-harvest yield forecast model for rice. The calibration of the crop yield model showed a good R2 (0.93) with p value <0.001. In future, it will be done for all the major crops grown in Goa.

An economic analysis of agricultural sustainability in west coast of India

(Viswanatha Reddy K)

This research presents an empirical illustration of districts of west coast of India with a coastline of 3100 km. The population density is more than the national average (382 persons per Km2) in the western coast of India. Thiruvananthapuram has highest (1508/km2) and Kutch has the lowest (46/km2). Uttara Kannada has the highest (81%) forest cover and Rajkot has the lowest (1%). Majority of the west coast districts occupy significant area under forest. In crop intensity, Kozhikode district has highest (137%) and the lowest in Goa (Both South and North Goa) (101%). Most of the coastal districts demonstrate less crop intensity compare to national average (135%). Kutch has the highest livestock density (5527 animals per Km2) and Kozhikode has the lowest (210 animals per Km2). Most of coastal districts show lower livestock compare to non-coastal districts.



Synthesis of location specific IFS models and energy budgeting of different agri-horti cropping systems

(Paramesha V)

Synthesized IFS model (1 ha) for Kalyani, comprising crop (0.41 ha), vegetables (0.10 ha), dairy (2 Cross bred cow + 2 calves), fishery (0.05 ha) along with enterprises like vermicomposting, biogas and boundary plantation with a cost of Rs. 2,27,156 provided 43% higher net profit, 52% higher water productivity, 22% higher employment generation and gave a 2.7 % higher production (in terms of REY) as compared to existing system. Synthesized IFS model (1 ha) for Sabarkantha district comprising crop (0.81 ha), vegetables (0.15 ha), dairy (1 Cross bred cow + 2 buffalos), fishery (0.07 ha), backyard poultry (15 birds), Goatery (4+1) along with enterprises like vermicomposting and boundary plantation with a cost of Rs. 2, 06,192 provided a 222% higher net profit, 61 % increase in water productivity, 150 % higher employment and 80% higher production (in terms of REY) as compared to the existing system.

The study has shown that sugarcane-sugarcane ratoon-wheat farming system is much more efficient than others in terms of energy use efficiency, net energy gain, energy profitability and human energy profitability followed by rice-wheat system and diversified system.

Harnessing dwarf and precocious Areca mutant

(V Arunachalam)

Areca/ betel nut palm (*Areca catechu* L.) is grown for masticatory/chewing uses. They grow 15-20 m tall and it is an constraint to undertake harvest and plant protection operations. The stem is slender and pose hazard to climbing persons. While mechanical interventions are being standardised genetic approaches to shorten the height of areca palm is crucial. A dwarf mutant identified in 1963 at Hirehalli near Tumkur of South Karnataka by scientists at CPCRI Regional Station Vittal. Eight half sib progenies of Hirehalli Dwarf areca palm were planted at the Institute in 1989. Half sib progenies of these palms are evaluated from 2011 to 2016 for growth. Six palms with precocious flowering and short stature (1.0 to 1.2 m in six years) are selected as Goa Butki Supari. Dwarf and early bearing areca variety has great demands among the farmers and home gardeners.

Leaf shape mutation in black pepper

(V Arunachalam)

A new mutant was identified in black pepper with lobed leaf shape in the eight progenies of Panniyur-5. This unique black pepper accessions with mutated leaves, unreported in the world genepool of black pepper and can be a valuable genetic source as morphological marker. Leaf mutations like two, three and four leaves joined together one petiole and two separate leaves with a joint petiole were also observed and characterised.

Studies on value addition in floral products through production of potpourri

(Safeena SA)

Studies were carried out to evaluate the ability of rose petals to obtain and retain different colour shades for production of potpourri. Tinting the rose petals with edible dyes can enhance the aesthetic value of potpourri by providing a great variety of colours and it helps the farmers to increase returns. Different dyes *viz.,* Tartrazine, Sunset yellow + Carmosine, Tartrazine + Brilliant blue, Tartrazine + Carmosine + Sunset yellow and Royal blue were used as colouring agents at 1 % concentration and rose petals were immersed in dyes for 24 hours. It has been recorded that tinting of rose petals with various colouring agents successfully induced colours in rose petals ranging from lemon yellow, Orange red, Green, orange and blue. Further the tinted rose petals along with left outs from spices like cinnamon and nutmeg were used for potpourri production and its blending with different scents was standardized.

Coccinellid predators in cowpea ecosystem

(Maruthadurai R)

Diversity of coccinellid predators was studied in cowpea ecosystem. Adults and grubs were recorded on randomly selected plants. Seven species of coccinellid predators were found predating on cowpea aphid *Aphis craccivora*. The recorded species include *Chelomenes sexmaculata*, *Coccinella transversalis*, *Micraspis discolour*, *Brumoides suturalis*, *Hippodamia variegata*, *Scymnus latemaculatus* and *Pseudaspidemerus flaviceps*. Both grubs and adults were found predating on cowpea aphids. During the entire cropping season, the maximum number of grubs and adults of *C. sexmaculata* followed by *C. transversalis* and *M. discolour* were recorded.

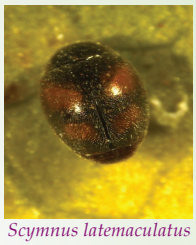
Chelomenes sexmaculata

Hippodamia variegata

Micraspis discolour

Brumoides suturalis

Coccinella transversalis



Scymnus latemaculatus

Promising rhizosphere bacterium in plant health management in coastal ecosystem

(R Ramesh)

A rhizobacterium (*Bacillus methylotrophicus* Strain RCh6-2b) has been identified as one of the promising bio-agent in suppression of various plant pathogens (*Macrophomina phaseolina, Rhizoctonia solani, Sclerotium rolfsii, Phytophthora capsici* and *Ralstonia solanacearum*) during the screening and field experiments. The strain was identified based on morphological, biochemical and 16S rRNA sequence (NCBI Accession number of 16s rRNA sequence is KU682845). Morphological description and biochemical characteristics of this strain were documented. The culture is deposited in the national repository of NBAIM, Mau (Accession No. NAIMCC-B-01889) and also with MTCC, IMTECH.

Further studies of the bacterium indicated that it produced more than one antimicrobial compounds, which are inhibitory to the test pathogens. Being a good rhizosphere colonizer, broad spectrum pathogen inhibition ability and secretor of antimicrobial compounds with longer shelf life in the formulation, the strain is a promising biological agent in plant health management under coastal ecosystems.

Integrated strategies for the management of black pepper foot rot in Goa

(R Ramesh and AR Desai)

Foot rot is a serious production constraint in black pepper and complete loss of crop due to this disease was observed in Goa. Integrated strategies for the management of this disease were designed in consultation with ICAR-IISR, Kozhikode. Bio-agents were applied to the soil during planting and continued every year. Observations over a period of three years indicate that treatment with bio-agents (talc formulation of *Trichoderma* sp) protected the black pepper plants from foot rot. Better protection was recorded in treatments where nematicide or anti-fungal and anti-nematode bio-agent were used. The plants treated with bio-agents are healthy, vigourous and produced fruiting spikes early. This management strategy could be recommended for cultivation of black pepper in this region.

Grafting of tomato on wild brinjal reduced bacterial wilt

(R Ramesh)

Bacterial wilt is a serious disease of tomato and most of the commercial varieties are susceptible to this disease. Based on our previous findings, wild brinjal was used as root stock and the grafts were evaluated for the disease incidence. Three varieties of tomato were evaluated by challenge inoculation with the pathogen. In non-grafted seedlings, wilt started after 4-5 days of inoculation while in grafts wilting was observed only after 10 days. It was recorded that 80-100% non-grafted seedlings in all the varieties wilted at the end of evaluation. However, only 12.5 to 20 per cent wilt was recorded in grafted plants. Considering the non-availability of desired bacterial wilt resistant tomato varieties, grafting approach could be a promising strategy for the bacterial wilt management.

Screening of milk samples for major mastitis causing pathogens

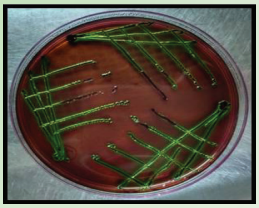
(Susitha Rajkumar and N Shivasharanappa)

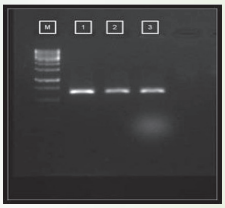
Milk samples were collected from individual quarters of mastitis affected and healthy cows from various small dairy units in Goa. Milk from apparently healthy quarters were subjected to California Mastitis test. A total of 30 milk samples were collected and screened for the presence of *Staphylococcus spp*. *Streptococcus spp*. and *E.coli*. The samples were initially enriched using specific selective broth media for these pathogens followed by streaking in specific agar media. Colonies suspected for *Staphylococcus* were isolated from four samples which were showing double zones of haemolysis on blood agar. These isolates were examined microscopically and identified as Gram positive coccii and were subjected to biochemical tests like oxidase, catalase and coagulase test and identified as coagulase positive Staphylococcus.

Screening of diarrheic fecal sample from calves for pathogenic strains of *E. coli*

(Susitha Rajkumar and N Shivasharanappa)

A total of 22 diarrheic fecal samples from calves were collected and were streaked over Mac Conkey agar. Lactose fermenting colonies were re streaked on EMB agar followed by biochemical tests indole, methyl red, Voges Proskauer and Citrate utilization test and 33 isolates were identified as *E coli.* DNA was isolated from these isolates and were screened by PCR for the presence of *stx1, stx2, aeaA and hlyA* genes encoding virulence factors in different types of *E coli*. PCR detected *stx1* gene encoding shigatoxin and *hlyA* gene

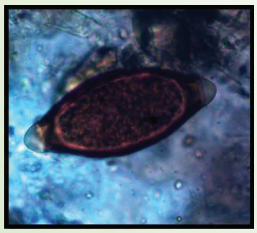


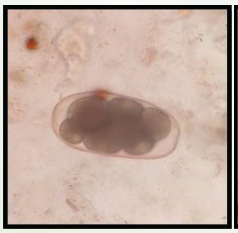


encoding enterohaemolysin in 3 isolates out of the 33 isolates indicating the presence of shigatoxin producing *E. coli* (STEC) and Enterohaemolytic *E. coli* (EHEC) in the dirrhoeic fecal samples.

Screening of cattle fecal samples for parasitic eggs

(Susitha Rajkumar and N Shivasharanappa)



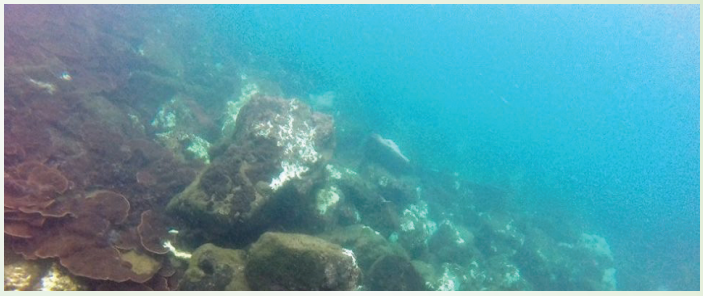


A total of 64 fecal samples were collected from apparently healthy or animals with diarrhea. The animals were from various small dairy units and two Goshalas in the Goa state and are of varying age groups. The fecal samples were subjected to direct microscopic examination, floatation using saturated salt solution and centrifugal sedimentation. This revealed the presence of protozoan parasite like *Eimeria*, *Buxtonella* and presence of eggs of *Paramphistomum* sp. and various nematode parasites. Presence of large number of Trichuris eggs in single field in fecal samples collected from Goshala indicates severe infection, where stray animals were brought and maintained in the farm.

Selective bleaching of stony coral, *Favites spp.* in Grande Island

(GB Sreekanth and Manju Lekshmi N)

Selective bleaching of stony coral *Favites* spp. was observed in the natural reef patches of Grande Island in Goa. This phenomen was recorded in the diver assited underwater visual census. This phenomenon was observed from Oct-Mar 2016. The bleaching was observed only in this hard coral species and the soft corals were not subjected to bleaching. However, there was no mass bleaching of corals in the natural reef patches.



Economic evaluation of various coastal aquaculture systems in Goa

(Manju Lekshmi N and GB Sreekanth)

Economic evaluation was performed for four different aquaculture systems in coastal waters of Goa from 2013 to 2015. An opinion survey was also conducted to study the effect of different aquaculture technologies introduced in coastal waters of Goa. Among the four systems, the semi-enclosed multi-species culture system (SEWMS) was the most productive system. Based opn high BC ratio, high rate of return and short payback period. Thus, multi-species culture was found to be more profitable than single species culture. Moreover, in the semi-enclosed system, the productivity and survival of species was higher due to the control of water flow through sluice gates. Goa is rich in semi-enclosed water bodies and these can be utilized for multi-species culture. The feedback from the farmers about the dissemination of culture techniques revealed that adequate technical support increases the confidence level of the farmers.

NEW INITIATIVES

Extra mural research project

(GR Mahajan)

An extra mural research project entitled 'Characterization and development of low-cost interventions for management of the degraded coastal saline soils' has been funded by extramural funds of Division Natural Resource Management, ICAR, New Delhi. The project is sanction for one year with an allocation of 25.9 Lakhs. The objective of the project is to characterize the salt affected coastal soils of west coast of India using conventional and remote sensing techniques.

Germplasm resources of Pteridophytes of Western Ghats

(SA Safeena)

A block comprising of Ferns and fern allies of Western Ghats was established at the institute and regular observations on are being recorded on growth and yield. At preset Sprengeri fern (*Asparagus densiflorus* 'Sprengeri'), Lace fern (*Asparagus setaceus* syn. *Plumosus)*, Compact *sprengeri* fern (*Asparagus densiflorus* 'Sprengeri' compacta), Fox tail fern (*Asparagus densiflorus* 'Myers'), Sword fern (*Nephrolepis exaltata),* Creeping fern / Wart fern (*Polypodium scolopendria),* Fish tail fern *(Nephrolepis biserrata furcans)* , Button fern (*Nephrolepis cordifolia* 'Duffii'), Maiden hair fern (*Adiantum raddianum*), Leather leaf fern (*Rumohra adiantiformis*), Peacock fern (*Selaginella willdenowii*), Hard fern (*Blechnum orientale*), Soft fern (*Christella dentate*), Staghorn club moss (*Lycopodiella cernua*), Silverback fern (*Pityrogramma calomelanos*) etc have been collected, maintained and evaluated for their suitability for use as cut foliages or fillers.

MAJOR EVENTS

Two days training programme on "Mushroom production technology"

A Two days training programme on "Mushroom Production Technology" was organized during 6th to 7th January, 2016 at KVK of ICAR-CCARI in collaboration with Directorate of Mushroom Research, Solan for Tribal farmers. In the in Inaugural session, Dr. Narendra Pratap Singh, Director, CCARI and Dr. V.P. Sharma, Director DMR, Solan addressed the participants. The training programme covered lectures and on field demonstrations on different aspects such as production technology of oyster, button and paddy straw mushrooms, spawn production and compost production of white button mushroom.

Aqua Goa mega fish festival-2016

Fisheries section of ICAR-CCARI has participated with a scientific exhibition stall in the Third Aqua Goa Mega Fish Festival-2016 organised by Directorate of Fisheries, Govt. of Goa in collaboration with the NFDB, Hyderabad at Navelim from 7th to 10th January, 2016 and at Mapusa from16th to 17th January, 2016. Hon. Deputy Chief Minister of Goa, Shri. Francis D'Souza inaugurated the four days mega event in the presence of Hon. Fisheries minister, Shri. Avertano Furtado, Shri. Digambar Kamat (MLA, Margao) and Shri. Caitano Silva (MLA, Benaulim). During this occasion, stripped grey mullet, *Mugil cephalus* commonly known as "Shevto" was declared as the state fish for Goa. A report with recommendations on state fish was compiled and submitted by Fisheries Section of ICAR-CCARI. A detailed presentation on "Opportunities in Ornamental Fish Farming" was

delivered by Mrs. Manju Lekshmi N, Scientist (FRM) of ICAR-CCARI.

Training on "Women empowerment through ornamental fish farming and economic dairy production"

A training programme on "Women Empowerment through Ornamental Fish Farming and Economic Dairy production" under "Mera Gaon Mera Gaurav" programme was organised on 12th January, 2016 at Ibrahimpur Village, for about 35 women trainees Dr. Susitha Rajkumar, Scientist (Veterinary Pathology) gave on-farm training on Calf management and Mastitis control methods. Mrs. Manju Lekshmi N, Scientist, (Fisheries Resource Management), delivered a Lecture on "Opportunities of Women in Ornamental fish farming". Dr. E.B. Chakurkar, Coordinator "Mera Gaon Mera Gaurav" and Dr. NP Singh, Director, ICAR-CCARI provided all the support for this programme.

SCI-FFI, first Science film festival of India-2016

ICAR-CCARI has actively participated in the SCI-FFI, First Science Film Festival of India, an unique festival held in the ESG premises, Panaji from 14th to 17th January, 2016. The Institute exhibited the technologies developed and research posters in the stall. Dr. E. B. Chakurkar also made a presentation and two films on ICAR and ICAR-CCARI were screened. This was followed with an interactive session with the participants. The Valedictory Ceremony was honoured by the presence of Honourable Chief Minister of Goa, Shri. Laximikant Parsekar.

Short term training programme on entrepreneurship development in fisheries

A three days training programme on "Entrepreneurship development in fisheries sector" was conducted at Field Training Centre of Fisheries Department Farm, Govt. of Goa, Dhauji organised by State fisheries department in collaboration with ICAR-CCARI from 14th to 15th and 22nd January, 2016. The training programme was attended by about 60 students from Carmel College for women, Nuvem and Dhempe college of Arts and Science, Miramar. The training covered lectures on value addition in fishes, integrated fish farming and coastal aquaculture. There were practical sessions on preparation of value added products from fishes. The training programme was co-ordinated by Mrs. Manju Lekshmi N, Scientist (FRM) and Mr. Sreekanth GB, Scientist (FRM) of Fisheries Section, ICAR-CCARI.

Republic day celebrations

ICAR CCARI celebrated the 67th Republic Day on 26th January, 2016. Dr. NP Singh, Director hoisted the flag in presence of all the staff members and their families. During his address, he stressed on the development and dissemination of farmer friendly technologies from the institute to the field. He also pointed that the communication of research work in peer reviewed journals, technical bulletins and other publications are also necessary to meet the global demand in agricultural research. Moreover, the ICT based initiatives in agricultural research and development will hold a key in quick transfer of scientific and technological information to the farmers which will also go hand in hand with the mandate of Digital India initiative.

Training programme on "Power tillers and other agro machinery"

A three day training programme on operation and maintenance of Power Tillers and other Agro Machinery was held from 4th to 6th February, 2016 in Gaodo ngrim, Shristhal and cola villages for tribal farmers, youth and agro machinery operators by Dr. Mathala Juliet Gupta with help of Goa Tractors Tillers and Aagencies, Mapusa, Varsha Associates, Old Goa, Ratnagiri Impex Pvt. Ltd. Bangalore and Compton Greaves HQ, Mumbai for the tribal beneficiaries of TSP funded project of ICAR-CCARI. Hands on use of power tillers and all attachments with special training on use of cultivators, mould board plough and Htp pump for tillage, inter cultivation in orchards and use for spraying in plantation crops, mini rotary tillers and brush cutters were provided.

Distribution of fishing materials to tribal fishermen along Zuari estuary

A programme on "Distribution of eco-friendly fishing gears and ropes" was organised at the Institute on 15th February, 2016. Sustainable ecofriendly fishing gear (gillnet) materials (300 kg) and ropes (200 kg) were distributed among thirty tribal fisher-folk of Tiswadi, Dr. NP Singh, Director, welcomed the gathering and briefed about the research and extension activities of the institute. While inaugurating the function, Secretary (Fisheries), Govt. of Goa, Shri. Amjad Tak, IAS appreciated the efforts of ICAR-CCARI for improving the livelihood of fishermen. There was series of publications (Book- "Goan Sea Food Recipes" and Posters on Fisheries Resources of Goa) released from ICAR-CCARI during the function. Mr. Sanjay Pereira, Head of the Shree Shantadurga Fishermen Association proposed vote of thanks and urged full support from Department of Fisheries, Ministries and research institutions like ICAR-CCARI for the conservation and augmentation of fishery in Zuari estuary.

A village seminar by FET scientists (NAARM) and ICAR-CCARI at Ibrampur

A village seminar was organised by the Scientists trainees from ICAR-NAARM, Hyderabad in association with ICAR-CCARI on 19th February, 2016. About 60 farmers were present in the programme. Dr. Narendra Pratap Singh, Director, emphasised on different government schemes for farmers in Banana cultivation, construction of vermicompost unit and scientific dairy farming. The FET Co-ordinator, Dr. S Ravichandran, Principal Scientist, NAARM stressed upon the significance of field experience training. The scientists from ICAR-CCARI, Old Goa, Dr. E.B. Chakurkar, Principal Scientist (Animal Science) shared their expertise on health management of cow and clean milk production and Dr. GR Mahajan, Scientist (Soil Science) on soil health management. Finally, there were deliberations by FET scientists on problems, probable solutions and opportunities for development of agriculture in Ibrampur village.

Training programme on advances in production technology of banana

A field level training programme on 'Advances in production technology of banana' was conducted by ICAR-CCARI, Goa on 19th February, 2016 at Ibrahmpur village of Pernem Taluka as part of the 'Mera Goan Mera Gaurav programme'. The technical session was handled by Ms. Maneesha SR, Scientist (Fruit Science), ICAR-CCARI, Goa. Distribution of banana suckers and vegetable seeds to the farmers was also done after this programme.

Visit of Hon. Shri. Francis D'Souza's Deputy Chief Minister, Govt. of Goa

Honorable Shri. Francis D'Souza, Deputy Chief Minister, Govt. of Goa visited this institute on 23rd February, 2016. During the visit, he was appraised about the Institutional activities and various technologies developed at the Institute. He visited to piggery unit, fodder unit, rabbit unit, poultry and quail unit, hydroponic fodder production unit and dairy unit of the Institute. He also visited to rice and other experimental crop fields and appreciated the scientists of ICAR-CCARI for conducting very good research work and giving valuable output to the farmers of Goa.

Snake awareness programme

A snake Awareness Programme was organised at the Institute for staff members and all field workers of the institute in conference hall on 26th February, 2016. Mr. Amrut Singh, President, Animal Rescue Squad, Goa working for the protection of wildlife in Goa was the Chief Speaker. He demonstrated various poisonous, semi-poisonous and non-poisonous snakes live and also made a presentation showing in detail the identification marks etc. He also discussed about the common myths, first aid on snake bites and need of snake conservation.

Training on "Entrepreneurship development through value addition in floral products"

Institute organized a Training programme on "Entrepreneurship development through Value addition in floral products" for farm women, housewives and unemployed youth on 27th Febraury 2016. The training programme was organised under "Mera Gaon Mera Gaurav" programme, in collaboration with Surla Farming Co-operative Society at Temple Hall, Devulwada, Surla, Goa. Dr. SA Safeena, Scientist (Floriculture and Landscaping) was the resource person. A talk on "Value addition in floral products" was delivered. In practical session, participants were taught the techniques of dry flower making, potpourri making, use of pressed flowers and foliages in designing of book marks, greeting cards, photo frames, flower arrangements etc.

ICAR-CCARI observes its Foundation day

Institute celebrated its foundation day on 1st April, 2016. This occasion was blessed with the presence of Chief Guest, Dr. Gurbachan Singh, Chairman, ASRB, New Delhi. Dr. NP Singh, Director, ICAR-CCARI highlighted the journey of the institute from a research station to a full-fledged central institute. A brief mention of the research achievements of the institute was followed. The institute honoured the staff members who performed well during the last year with mementoes and certificates. There was release of a series of publications (posters

on heliconia, technical bulletin and leaflet on bypass fat (in Marathi), annual report of the Tribal Sub Plan (TSP) project (2012-13 and 2013-14), publications from Krishi Vigyan Kendra (Extension folders (marathi) on mastitis, azolla cultivation, preparation of silage and enrichment of poor quality roughages with urea)) during the event. Dr. Gurbachan Singh congratulated the Director and the staff for their team work, salient achievements and ensured whole hearted support for the Institute in future. He also stressed upon the need of research programmes including sustainable integrated farming systems models, biovillages, organic farming systems, climate change and farming systems, climate resilient coastal agriculture, germplasm conservation and water harvesting systems, energy efficient technologies in farming systems, economic evaluation of the farming practices.

NRM Directors meet

Director's meet of NRM Institutes under ICAR was organised during 11th-12th April, 2016. Conference was graced with the presence of Dr. AK Sikka, DDG (NRM), Dr. SK Choudari, ADG (SW&M), Dr. PS Minhas, Director, (ICAR-NIASM), Dr. DK Sharma, Director (ICAR-CSSRI), Dr. AR Sharma, Director (ICAR-DWR), Dr. A Raizada, Head (ICAR-IISWC). Dr. AK Patra, Director (ICAR-IISS), Dr. SK Singh, Director (ICAR-NBSS&LUP), Dr. SK Ambast, Director (ICAR-IIWM), Dr. OP Chaturvedi, Director ICAR-(CAFRI), Dr. AS Panwar, Director (ICAR-IIFSR), Dr. OP Yadav, Director (ICAR-CAZRI), Jodhpur, Dr. BK Kandpal, Principal Scientist (Agro) and Dr. SK Dhyani, Principal Scientist, (AF), ICAR, New Delhi. Director (ICAR-CCARI), Dr. NP Singh welcomed all the delegates. All the dignitaries visited the fields and labs of Institute, KVK and farmers fields. Technical session was chaired by DDG to discuss on Natural Resource Management related issues and how to address the problems in a network mode, particularly related to the coastal region of the Country. The programme concluded with special emphasis on collaborative research among all NRM institutes in a network mode on biodiversity conservation, coastal delineation and mapping of soil, water, ecosystem and farming system.

Workshop on "Value addition to fruits and flowers"

A Work shop on "Value addition to fruits and flowers" was jointly organised by ICAR–CCARI and 'Vasco Watch', a fortnightly neighbourhood newspaper of Goa on 22nd April 2016, at Issorcim. Lecturers were delivered by Dr S Priya Devi and Dr. SA Safeena on "Value addition to fruits and flowers" followed by method demonstration. Preparation of value added products like Wax apple jam, Jackfruit Pickle, Jack seed payasam, Jackfruit pulp etc were demonstrated. The participants were trained on flower drying technology, flower arrangement techniques, dry flower making, potpourri making, use

of pressed plant materials in designing of wall hangings, book marks, greeting cards, photo frames etc.

Workshop/Seminar/Symposia/Training attended

Date	Name	Programme	Venue
16th November, 2015 to 29th February, 2016	Bappa Das	Professional attachment training	BCKV, Mohanpur, West Bengal
18th November, 2015 to 18th February, 2016	Paramesha V	Professional attachment training	ICAR- IIFSR, Meerut, Uttar Pradesh

3rd to 7th January, 2016	GR Mahajan GB Sreekanth	103rd Indian Science Congress	Mysore University, Mysuru, Karnataka
14th to 17th January, 2016	NP Singh AR Desai M Thangam MJ Gupta	11th National Symposium on Innovations in Coastal Agriculture-Current Status and Potential under Changing Environment	IIWM,Bhubaneswar, Odisha.
19th to 21st January, 2016	MJ Gupta	ISAE 50th Convention and Symposium on Agricultural Engineering in National Building: Contributions and Challenges	College of Agri.Engineering and Technology,OUAT, Bhubaneswar,Odisha
23rd to 24th January, 2016	NP Singh	Vice chancellors and Directors meeting	NASC Complex, Pusa, New Delhi
6th February, 2016	RS Rajkumar	Seminar on Renal Failure in Dogs	Hotel Mi Casa, Panjim Goa
9th February,2016	Manohara KK	Review Meeting of Half Yearly Progress of Foreign Aided Project	Krishi Anusandhan Bhavan, New Delhi
11th February, 2016	NP Singh	Review meeting of RKVY	Krishi bhavan, Directorate of Agriculture, Goa
10th to 12th February, 2016	V Arunachalam S Priya Devi	International Conference on Biodiversity and bioactive natural substances for human welfare	Government Arts College, Karur, Tamil Nadu
10th to 12th February, 2016	Viswanatha Reddy K	Training workshop on competency development of HRD nodal officers of ICAR.	ICAR-NAARM, Hyderabad, Andhra Pradesh
13th February, 2016	NP Singh	State level Conference on "Value addition in Agriculture for better marketing"	Ravindra Bhavan, Margao, Goa
16th February, 2016	NP Singh	XXVIIth meeting of the SLEC for National horticulture Mission and On Farm Water Management (OFWM)	Secretariat, Porvorim, Goa
19th to 20th February, 2016	AR Desai	National Seminar on Strategies for Development of Cashew	RFRS,Vengurla
25th to 26th February, 2016	RS Rajkumar	National Seminar of Food Safety, Health and Envviroment	Madras Veterinary college, Chennai,Tamil Nadu
26th February, 2016	M Thangam	Field Day on Amaranthus	NBPGR Regional Centre,Thrissur, Kerala
3rd to 4th March, 2016	Bappa Das	Recent Advances in Statistical Tools for Agriculture and Allied Sciences	BCKV, Mohanpur, West Bengal
5th March, 2016	Bappa Das	Climate Change and Extreme Weather: Assessment of Vulnerability for Early Warning	Indian Museum, Kolkata, West Bengal
10th to 11th March, 2016	GR Mahajan	Brainstorming session on groundnut area expansion in non-traditional areas and newer cropping systems on	ICAR-DGR, Junagadh, Gujarat
19th to 21st March, 2016	NP Singh V Arunachalam	WNC 2015 Second World Noni Congress	SRM University, Chennai, Tamil Nadu
3rd to 4th April, 2016	NP Singh Manohara KK	AICRP- Rice meeting	ICAR-IGKV, Raipur, Chhattishgarh
26th April, 2016	NP Singh	Meeting of Don Bosco College of Agriculture	Provincial House, Odxel, Goa
27th to 29th April, 2016	Maneesha SR	National conference on fruit breeding in Tropics and subtropics- An Indian perspective	ICAR-IIHR, Bengaluru, Karnataka

PERSONALIA

Awards/Recognition

Dr. V Arunachalam

- Recognized as Faculty member to guide interns under the NNMCB (National Network for mathematical and computational biology) supported by Science and Engineering Research Board, Government of India 2016-17.

Dr. GR Mahajan

- International Plant Nutrition Institute's (IPNI) 2015 photo contest for crop nutrient deficiency symptoms - Second prize in potassium category – Potassium deficiency in groundnut.

Ms. SR Maneesha

- Peerless poster presentation award was bestowed in 'National conference on fruit breeding in Tropics and subtropics- An Indian perspective' at ICAR-IIHR, Bengaluru held during 27th to 29th April, 2016.

Superannuation

1) **Smt. Rukma Ramesh Naik,** Skilled Support Staff, superannuated on 31st January, 2016.
2) **Shri Vinayak Dattatraya Kulkarni,** Assistant Chief Technical Officer superannuated on 29th February, 2016.

Appointments

- **Shri Sujeet Desai,** Scientist (on probation) in the discipline of Land & Water Management Engineering joined at ICAR-CCARI, Goa on 2nd April, 2016 (afternoon) after completion of 103rd FOCARS at NAARM., Hyderabad.

Promotion

1. **Dr. S.Priyadevi,** Senior Scientist (Fruit Science) granted higher Research Grade Pay in the Pay band. Placed in Pay Band-4 Rs. 37400-67000 + RGP Rs. 9000/- w.e.f. 19-11-2013.
2. **Dr. Z.B. Dubal, Scientist** (Veterinary Public Health) granted higher Research Grade Pay in the Pay band. Placed in Pay Band-3 Rs. 15600-39100 + RGP Rs. 8000/- (To be designated as Senior Scientist) w.e.f. 01-01-2014.
3. **Dr. Maruthadurai R.,** Scientist (Agril. Entomology) granted higher Research Grade Pay in the Pay band. Placed in Pay Band-3 Rs. 15600-39100 + RGP Rs. 7000/- (To be designated as Scientist) w.e.f. 27-04-2015.

Clearance of Probationary period and confirmation

1. **Smt. Manju Lekshmi N.** Scientist (Fisheries Resource Management), Date of which Probation cleared 31-12-2014, Date of Confirmation 01-01-2015.
2. **Shri Nitin Naik,** Skilled Support Staff, Date of which Probation cleared 5-1-2016, Date of Confirmation 6-1-2016.
3. **Shri Mayur Namdev Mandrekar,** Skilled Support Staff, Date of which Probation cleared 5-1-2016, Date of Confirmation 6-1-2016.
4. **Smt. Swati Ravindra Khandeparkar,** Skilled Support Staff, Date of which Probation cleared 6-1-2016, Date of Confirmation 7-1-2016.
5. **Shri Prallad Zambaulikar,** Skilled Support Staff, Date of which Probation cleared 7-1-2016, Date of Confirmation 8-1-2016.
6. **Smt. Sarita K Shelko,** Skilled Support Staff, Date of which Probation cleared 16-1-2016, Date of Confirmation 17-1-2016.