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किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

In this issue

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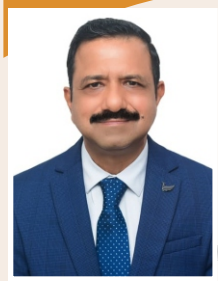


Agro-Ecotourism: Building Climate-Resilient Livelihoods in Coastal India

Over the past two years, ICAR–Central Coastal Agricultural Research Institute, Goa, has taken significant strides in positioning agro-ecotourism as a transformative pathway for sustainable livelihoods, climate resilience, and rural entrepreneurship across the coastal states of India. Recognising the synergy between agriculture, ecology, culture, and rural development, the Institute has adopted a holistic approach to mainstream agro-ecotourism within farm systems, research planning, and stakeholder capacity-building.

A landmark achievement has been our role in developing the Policy on Promotion & Regulation of Agro-Eco-Tourism in Goa, formulated jointly with ICAR-NAARM and adopted by the Government of Goa. This policy—released by the Hon'ble Chief Minister—has paved the way for a state-wide enabling ecosystem for farmers, FPOs, SHGs and youth entrepreneurs. Dedicated budget provisions were subsequently announced in the Legislative Assembly, reflecting the impact of our scientific inputs and evidence-based policy support.

ICAR-CCARI has implemented several model agro-ecotourism interventions showcasing integrated farming systems, traditional food trails, biodiversity walks, livestock-based experiential learning, and value-added farmer enterprises. Our field demonstrations across North and South Goa have served as live learning laboratories for officials, students, and entrepreneurs from multiple states. The Institute also played a catalytic role in documenting and scaling successful community initiatives, including those led by women farmers, tribal groups, and coastal youth.

The Institute's flagship 21-Day ICAR Winter School (February 2025) on "*Building Climate Resilience and Sustainability through Agro-Eco-Tourism*" brought together participants from 16 states, international experts, and national institutions. Through lectures, hands-on sessions, and field visits to spice plantations, island-based tourism models, and community-run farm tourism units, the programme has developed a new cohort of trained professionals capable of integrating agro-ecotourism with climate-smart agriculture.

Our efforts also include support for GI-based agro-ecotourism, rural food culture revitalisation, ethno-veterinary heritage, and value-addition start-ups through the AGNI-ABI Centre. Partnerships with GTDC, Goa Forest Department, ICAR institutes, universities, and global collaborators have strengthened the scientific backbone of these initiatives.

As we look ahead, ICAR-CCARI remains committed to empowering farmers through knowledge, innovation, and enterprise. Agro-ecotourism is not just a livelihood option—it is a bridge that connects sustainable agriculture, environmental stewardship, and cultural pride. Together, we can continue to build a resilient and vibrant coastal agricultural landscape.

DIRECTOR

RESEARCH HIGHLIGHTS

Evaluation of Fodder Maize under Rice fallow in lowland situations of Goa

(Paramesha V and Manohara KK)

The underutilization of rice fallows in lowland areas of Goa presents an untapped opportunity to enhance cropping intensity, fodder availability, and farm income through the introduction of short-duration forage crops. To address the acute green fodder scarcity during the post-monsoon period, an evaluation was conducted on the performance of *African Tall* maize under rice fallow conditions in the coastal lowlands of Goa. The study aimed to assess its adaptability, productivity, and nutritive potential under residual soil moisture and fertility conditions following kharif paddy harvest. Field trials conducted during 2022-2023 *Rabi* season at ICAR–Central Coastal Agricultural Research Institute (ICAR–CCARI), Old Goa, revealed that *African Tall* exhibited vigorous vegetative growth, attaining plant heights of 2.6–3.2 m and producing 45–55 t ha^{-1} of green fodder and 8–9 t ha^{-1} of dry matter within 60–70 days of sowing. The crop also recorded a crude protein content of 8–9% and a favourable leaf-to-stem ratio (0.48–0.52), indicating good digestibility and palatability for dairy cattle. Its tolerance to temporary waterlogging, robust root development, and efficient nutrient utilisation under residual fertility make it particularly suitable for the coastal lowland ecosystem. Recommended agronomic practices include sowing between late November and early December at a seed rate of 40–45 kg ha^{-1}, 30 cm row spacing, and nutrient application of 60:30:30 kg N:P2O5:K2O ha^{-1} in two splits. Harvesting at early tasseling ensures optimal nutritive value. The integration of *African Tall* into rice-based systems provides a reliable source of quality green fodder during the lean season, improves livestock productivity, and enhances the overall sustainability and profitability of lowland farming. This intervention demonstrates a viable pathway for converting idle rice fallows into productive fodder resources, thereby strengthening coastal dairy-based livelihoods and supporting the climate-resilient intensification of the rice–fallow ecosystem in Goa.

Evaluation of turmeric as an intercrop under arecanut and coconut plantations of Goa

(Paramesha V and Manohara KK)

The integration of high-value intercrops within existing plantation systems offers a promising approach for improving resource use efficiency and profitability in coastal agroecosystems. To The integration of high-value intercrops within existing plantation systems offers a promising approach for improving resource use efficiency and profitability in coastal agroecosystems. To explore this potential, ICAR–Central Coastal Agricultural Research Institute (ICAR–CCARI), Old Goa, evaluated the performance of turmeric (*Curcuma longa* L.) as an intercrop under established arecanut and coconut plantations on lateritic soils of Goa during the year 2022 and 2023. The study aimed to assess varietal performance, yield potential, and system compatibility of two promising turmeric varieties, 'IISR-Pragati' and 'Salem', under partial shade and humid tropical conditions. Turmeric was planted in June–July in the interspaces of 8–10-year-old arecanut and coconut stands, maintaining appropriate spacing and organic enrichment through the application of farmyard manure and mulching. Both varieties established well and completed their growth cycle without adverse effects on the main crop.

Results indicated that 'IISR-Pragati' performed better under both plantation systems, recording a rhizome yield of 17–18 t ha^{-1} under arecanut and 16–17 t ha^{-1} under coconut, compared to 15–16 t ha^{-1} and 14–15 t ha^{-1}, respectively, for 'Salem'. The higher performance of 'IISR-Pragati' was attributed to its vigorous growth, adaptability to filtered light, and efficient nutrient uptake under shaded microclimates. The intercrop also contributed to improved soil organic carbon and microbial activity through residue recycling and reduced evaporation losses due to ground cover. The study concludes that turmeric, particularly the 'IISR-Pragati' variety, can be effectively integrated into arecanut and coconut plantations of Goa, optimising land productivity, enhancing income diversification, and improving soil health in lateritic landscapes. The system exemplifies a sustainable, resource-efficient model of coastal agroforestry intensification suitable for smallholder farmers.

Evaluation of finger millet (*Eleusine coracana*) as an intercrop under cashew plantations of Goa

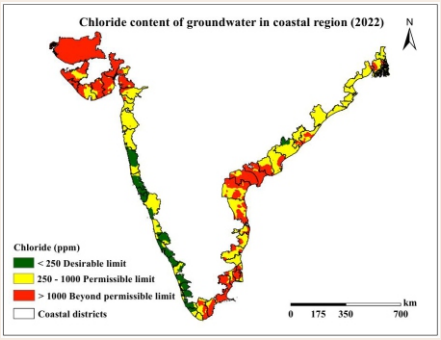
(Paramesha V and Manohara KK)

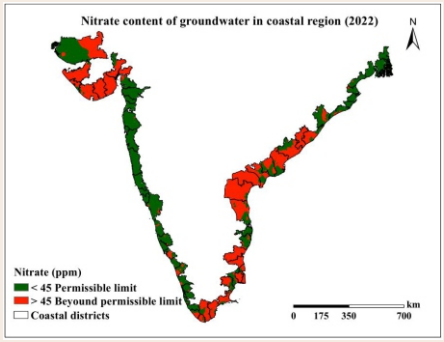
Enhancing land productivity and sustainability in perennial plantation systems through the use of suitable intercrops is a key strategy for diversified and resilient farming in coastal regions. In this context, the ICAR–Central Coastal Agricultural Research Institute (ICAR–CCARI), Old Goa, evaluated the performance of finger millet (*Eleusine coracana* L.) variety KMR 301 as an intercrop under cashew plantations of Goa during *Kharif* 2022. The objective was to assess the adaptability, yield performance, and system benefits of finger millet under partial shade and lateritic soil conditions typical of the region. Field trials were conducted in mature cashew plantations (20–25 years old) across representative sites of North and South Goa, characterised by lateritic soils, moderate fertility, and sloping terrains prone to surface runoff. Finger millet (var. KMR 301) was sown during June–July using a spacing of 25 × 10 cm, following light tillage and application of basal nutrients (40:20:20 kg N:P2O5:K2O ha^{-1}). The crop grew well under the filtered light environment created by the cashew canopy and completed its life cycle without adversely affecting the main crop. Results revealed that finger millet yielded 1.2–1.3 t ha^{-1} of grain under cashew interspaces, demonstrating good shade tolerance of KMR 301. Furthermore, farmers reported reduced weed infestation and better soil moisture retention under the intercrop. The study concludes that finger millet (KMR 301) can be effectively integrated as an intercrop under cashew plantations in the coastal lateritic zones of Goa, providing an additional source of food grain and fodder while improving soil health and system productivity. This low-input, climate-resilient practice offers a viable model for sustainable

Assessment of groundwater quality in the coastal region of India

(Sujeet Desai and Bappa Das)

Groundwater is a crucial freshwater source for India's coastal regions, but it is increasingly stressed due to erratic rainfall patterns and over-extraction linked to climate change. The study assessed twenty groundwater quality parameters from more than 2,500 observation wells across coastal districts to understand spatial and temporal variability. The results indicated that groundwater electrical conductivity was largely fresh (<750 µS/cm) along the west coast and moderate (750–2250 µS/cm) along the east coast, with mineralized zones (>3000 µS/cm) occurring in certain districts of Gujarat and Andhra Pradesh. Alkalinity (200–600 ppm) and chloride (250–1000 ppm) contents were within permissible limits. Nitrate concentrations were within safe limits (<45 ppm) in the west coast but exceeded permissible levels in parts of the east coast due to non-point source pollution and leaching. Fluoride levels were generally within desirable (1.0 ppm) and permissible (1.5 ppm) limits, except for isolated patches in Andhra Pradesh and Gujarat. The study provides valuable insights into the degradation of groundwater quality, offering a scientific basis for developing climate-resilient groundwater resource management strategies for the coastal regions of India.





Integrated Watershed Management in the Ponda block, Goa

(Sujeet Desai, A. Raizada, A. R. Uthappa, & Shripad Bhat)

Integrated watershed management initiative was implemented in the Ponda block, Goa, by ICAR-CCARI as a Project Implementing Agency. Sustainable natural resource management and livelihood enhancement activities were carried out through a participatory approach. A total of 13,450 planting materials of mango, coconut, cashew, and black pepper were distributed across three panchayats to promote perennial-based land use and revive traditional kulagar systems. Capacity-building programmes were organized on water conservation and scientific livestock farming to strengthen livelihood resilience. Training and orientation sessions were also conducted for Self-Help Groups (SHGs) to empower rural communities and encourage entrepreneurship. Hydrological monitoring included pre- and post-monsoon groundwater level assessments with the identification of springs and streams for improving water conveyance and storage systems. The project has significantly contributed to sustainable natural

resource conservation, enhanced water availability, and improved rural livelihoods through integrated watershed-based interventions in Ponda taluka of Goa.

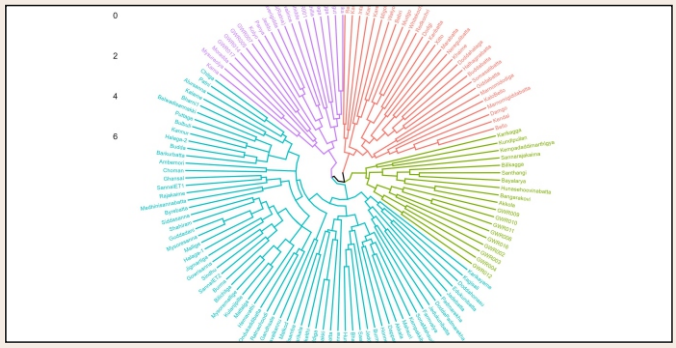
Morphological and Molecular Characterization Reveals High Genetic Diversity in Rice Germplasm from the Southern West Coast of India

(Manohara KK and Paramesha V)

The present study investigates the genetic diversity of 200 rice (*Oryza sativa* L.) accessions collected Goa, Maharashtra, and Karnataka. These landraces, including wild relatives, are vital for crop improvement due to their unique adaptations to local environments. The research aimed to assess this diversity using both agro-morphological traits and Simple Sequence Repeat (SSR) molecular markers. A total of 39 qualitative and 16 quantitative traits were assessed using standard descriptors. The Shannon diversity index (H′) revealed moderate to high diversity, with an average H′ of 0.62. The trait "length of longest panicle awn" exhibited the highest diversity (H′ = 0.99), followed by anthocyanin distribution in leaves and panicle branch attitude (H′ = 0.94). Traits such as leaf ligule color and sterile lemma color showed low diversity. Quantitative analysis showed high variability for traits like grain yield (GY), straw yield (SY), grain-to-panicle ratio (G/P), and harvest index (HI), each displaying coefficients of variation above 40%. High broad-sense heritability (>70%) was observed for all traits except flag leaf width, indicating strong genetic control and potential for selection in breeding programs. Principal Component Analysis (PCA) revealed that the first four components accounted for 71.7% of the total variance, with significant contributions from traits such as panicle length, awn length, and grain dimensions. Molecular characterization using 34 SSR markers yielded 174 alleles across the 200 genotypes. Marker RM10871 exhibited the highest polymorphism, with 19 alleles and a polymorphic information content (PIC) value of 0.92. The average PIC value across all markers was 0.60, indicating substantial marker informativeness. The SSR markers revealed a broad genetic base and allowed the identification of 15 unique allele identifiers, especially on chromosomes 1, 2, 3, 6, 7, 8, 10, 11, and 12, which can be useful for varietal identification and intellectual property protection. Cluster analysis using SSR data grouped the rice accessions into four major clusters with distinct sub-clusters, reflecting both geographical and genetic divergence. Principal Coordinate Analysis (PCoA) of agro-morphological data further confirmed this grouping, with wild rice and landraces from Goa and Maharashtra forming a cluster distinct from those of Karnataka. This

study provides one of the first comprehensive assessments of rice genetic diversity in the Southern West Coast of India using both phenotypic and genotypic data. The study revealed the presence of high genetic variability in the rice germplasm of west coast region and highlight their potential for use in future rice breeding and conservation programs.

Field view of rice germplasm evaluation at ICAR CCARI farm

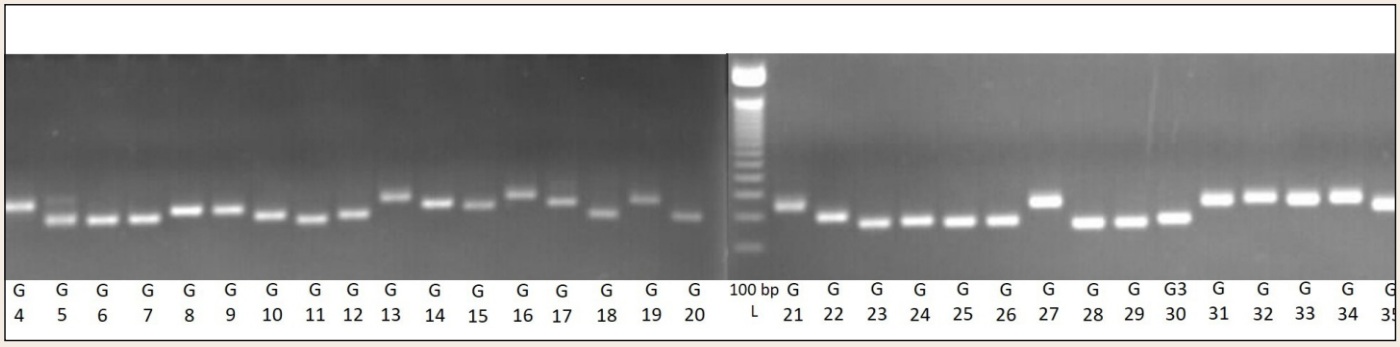


Diversity analysis using SSR markers in 200 rice germplasm from west coast region

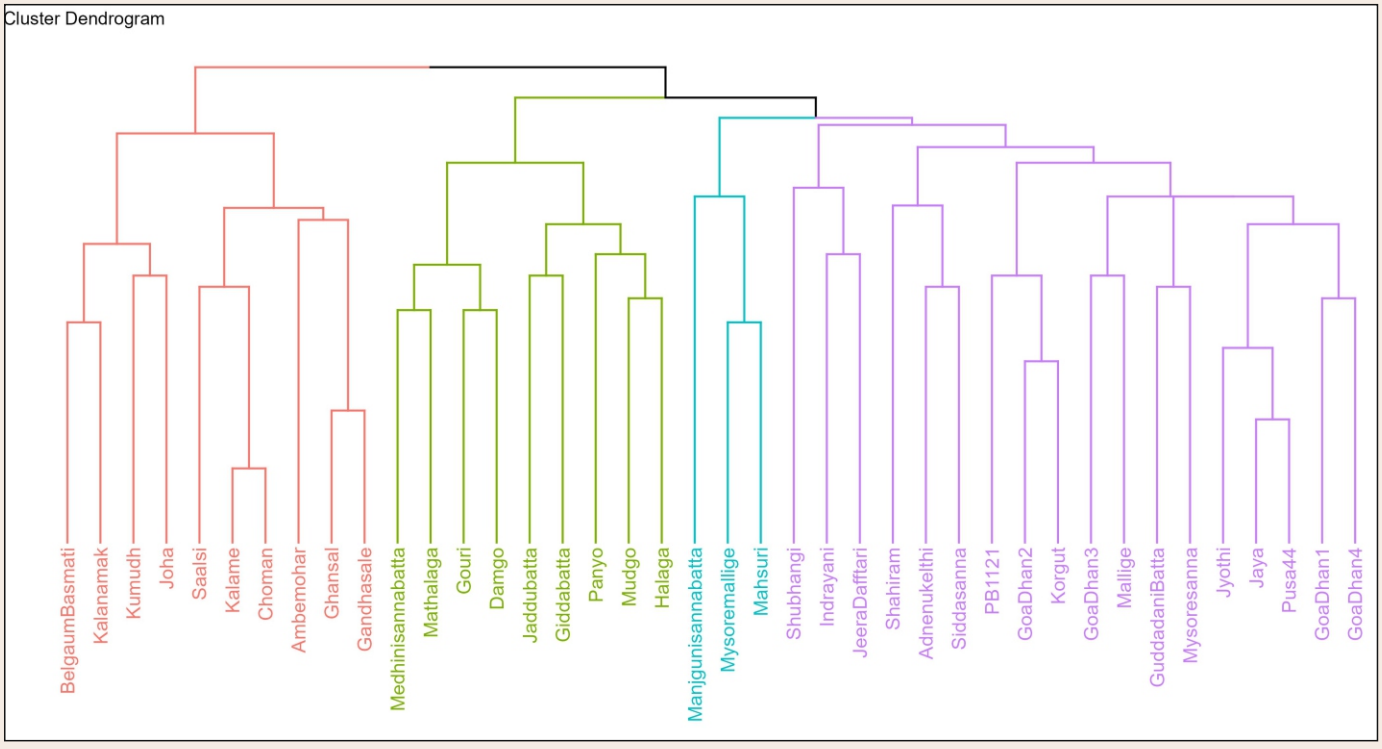
Assessment of Genetic Diversity in Aromatic and Non-Aromatic Rice Accessions from India's West Coast Region Using SSR Markers

(Manohara KK)

The Western Ghats and coastal regions of India, known for their ecological richness and traditional farming systems, harbor a vast diversity of indigenous rice (*Oryza sativa* L.) landraces. In this study, 40 rice accessions comprising of aromatic and non aromatic rice varieties from the West Coast region were assessed for genetic diversity using 60 Simple Sequence Repeat (SSR) markers. Out of these, 53 markers exhibited clear polymorphism and generated a total of 285 alleles, with an average of 5.4 alleles per locus. The marker RM493 showed the highest polymorphism (PIC = 0.89), while RM541 exhibited the lowest (PIC = 0.18). Shannon's Information Index ranged from 0.38 to 2.28, with an average value of 1.42, reflecting high genetic variability among the accessions. The effective number of alleles (Ne) varied significantly across loci, with an average of 3.98, further supporting the presence of broad genetic diversity. Cluster analysis using UPGMA grouped the 40 accessions into four major clusters, distinguishing aromatic and non-aromatic varieties. Aromatic accessions were predominantly found in Clusters I and IV, while non-aromatic accessions were distributed across Clusters II and III, along with a few aromatic types such as Pusa Basmati 1121 and Indrayani. Notably, Cluster II included salt-tolerant landraces and released varieties adapted to coastal saline environments. The study highlights the rich genetic diversity present in traditional rice landraces from India's West Coast and underscores the potential of underutilized germplasm in developing climate-resilient and high-quality rice cultivars. These findings contribute valuable insights for conservation efforts and future rice breeding programs.



Amplification profile of SSR marker RM 206 in forty rice accessions



UPGMA based clustering of aromatic and non aromatic rice accessions

Development of Ready-To-Eat (RTE) Animal and Fish-based Traditional Foods of Coastal India by Retort Processing

(R. Solomon Rajkumar, C. O. Mohan, Mathala Juliet Gupta , Susitha Rajkumar and Trivesh Mayekar)

The formulation of the traditional Goan Prawn Curry with Kokum rind and Tamarind as souring agents was standardized based on the information collected from housewives, and cooks, and preliminary trials and hedonic scale sensory evaluation were conducted. The preparation of gravy/curry medium and prawns was done separately. The best recipe was selected based on the Hedonic scale sensory evaluation by a selected consumer panel (Chart no 1). The gravy with Kokum rind as a souring agent has been selected for further processing. The retortable pouches having a three layer configuration of 12µ PET ALOX / 15µ Nylon/70µ cast polypropylene of size 16 x 18cm were used for filling the curry. The tests for the quality of the retort pouch carried out included tensile strength and elongation at break (IS 2508, 1984) and heat seal strength (ASTM, 1973) using Universal Testing Machine (Lloyd instruments LRX plus, Hampshire, UK) at ICAR-Central Institute of Fisheries Technology, Kochi, Kerala. The optimization of the F0 value was done at three different levels, 6, 7, and 8 minutes, and based on sensory evaluation, the F0 value was standardized. After processing, all the pouches were wiped dry and kept in a dustproof cabinet at ambient temperature (25–30°C). A pilot-scale Mill Walls Model 24 rotary retorting system that could withstand a working pressure of 3.5 bars was used for the experiment. The retort was operated in the steam/air mixture mode during the sterilization cycle. The temperature was set at 121.1 C with a o steam pressure of 1.05 bar and an over pressure of 2.1 bars for 55.76 min was maintained during each process cycle. Copper nickel thermocouples capable of measuring temperature in the range of 85°C to 145°C with an accuracy of ±0.1°C and a response time of 0.2 s, were used. The retort temperature (RT) was maintained at 121.1°C and air pressure was maintained at 28 psi throughout the heating and cooling periods. The lag factor for heating (J), the h slope of the heating curve (fh), time in minutes for sterilization at retort temperature (U), and lag factor for cooling (Jc) were calculated. The parameters, final temperature deficit (g), process time (B), and total process time (TB) were calculated. The parameters were determined by plotting temperature deficit (RT - Tc) on semi-log paper. Total process time (TB) was determined by adding process time (B) to the effectiveness of the come-up time. The product core temperature and the lethal rates (F0 value) were noted and the F0 value was calculated. The commercial sterility was performed as per the standards of IS: 2168 (1971) at the 45th day. The processed samples in thioglycolate broth were incubated in anaerobic conditions at 37°C for 48 h and at 55°C for 5 days to assess the commercial sterility of the products. The Goan Prawns curry in retort pouches is commercially sterile and the product is ready for

Genetic variability studies for thermotolerance in selected breeds of livestock under coastal environment

(Amiya R. Sahu and Gokuldas PP)

The temperature and humidity data for the year 2022-23 was accessed from the institute's meteorological observatory station. Temperature-humidity index (THI) indicated April to May month as extremely hot period and December to February month as a cool period of the year. Based on the THI result the blood samples were collected from native Shweta Kapila cattle (n=52) from different places of Goa. Rectal temperature and respiration rate recorded during hot and cold period were analyzed. The enzymatic activity of serum samples of different animals was estimated by a Biophotometer (Eppendorf). The TM serum ion concentration of the samples was estimated by Spectrophotometer reading. Genomic DNA was isolated from blood samples by phenol chloroform isoamyl alcohol method. DNA quality and quantity were checked. Oligonucleotide primers for HSP90 and HSP70 genes were designed by Primer 3 input version 0.4.0 software. The Standardization of amplification was carried out for all the regions. PCR amplicons of six random samples of Shweta Kapila cattle were sequenced for each amplified regions in both forward and reverse directions. Sequence results were analyzed using EditSeq and SeqMan of LASERGENE software version 7.1.0 (DNASTAR Inc., USA). Gene sequences were analysed for both forward and reverse reads using reference sequence of cattle HSP90 gene obtained from NCBI GenBank (Accession number: XM_019983599). On analysing sequences four novel SNPs (g.C1011T, g.A1209G, g.C1324T and g.T3814A) were detected in the Exon 3, Exon 5 and Exon 10 regions of HSP90 gene. Some of the sequences of HSP90 and HSP70 are yet to be analysed.

Conservation of major farm animal resources in the coastal region through evaluation of seminal traits, semen processing and preservation protocols

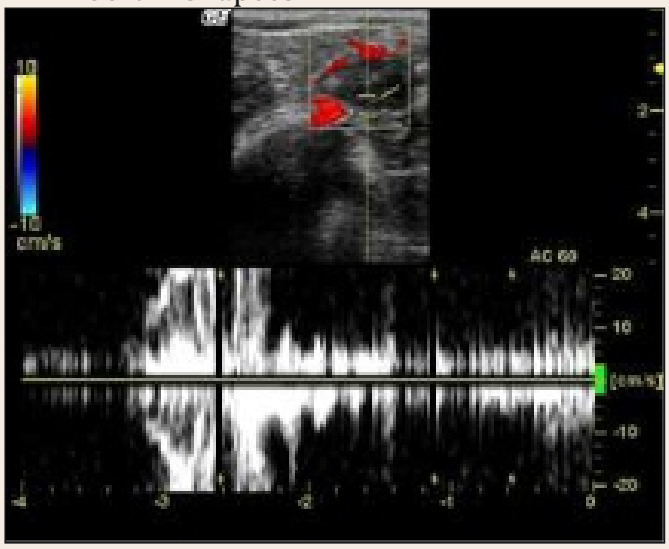
(Gokuldas PP and Amiya R. Sahu)

As a value addition to the conventional breeding soundness examination, detailed evaluation of testicular function was carried out using advanced digital Pulse Wave Doppler Ultrasound Imaging technology for the first time in indigenous cattle. A digital colour doppler ultrasound imaging machine Logiq® Book XP with multi-frequency linear array probe was employed for the study. Major pulse wave doppler ultrasound attributes include Peak systolic velocity (PSV), End diastolic velocity (EDV) and Resistive index (RI) measured along the various regions of the Testicular Artery (TA). The mean peak SV ranged from 4.98±0.02 to 12.01±0.26 m/s and mean EDV ranged from 3.72±0.03 to 5.09±0.16 m/s in different parts of

the TA in screened Shweta Kapila bulls. Significantly higher (P<0.05) values of peak SV (12.01±0.26 m/s) were recorded in spermatic cord part of TA. The EDV and PSV values measured in the regions of the spermatic cord were significantly (P<0.05) variable among the bulls and within individual bulls. Less variability of Resistive index (RI) was observed for values measured in different regions of the TA in the same bull. The findings of the study could be helpful in generating useful information on testicular hemodynamics and normal reference values of testicular per fusion in indigenous Shweta Kapila bulls.

Major seminal traits including qualitative and quantitative semen attributes were recorded for reproductive characterisation of Agonda Goan breed of indigenous pig employing sperm head dimensions and derived morphometric indices using multi-scan and semi-automated image analysis software. Sperm head dimensions including length and width of sperm head, head area, perimeter and tail length were measured, and these basic morphometric parameters were used to calculate additional derived morphometric indices characterising the sperm head viz. Ellipticity, Elongation, Rugosity, Form and Regularity. The mean length of sperm head and total sperm length were measured as 11.06±0.06 µm and 69.31±0.26 µm, respectively. Other recorded basic parameters were mean head width (6.01±0.05 µm), Head area (59.62±0.42 µm2), Head Perimeter (29.24±0.15 µm) and Tail length (58.25±0.26 µm). Rugosity or Roughness, which specifies the amorphous shape of the head, was 0.817±0.003 µm2 /pixel2 and Regularity index, indicating the spermatozoal head symmetry, was 0.91±0.007. Other derived sperm morphometric indices were Ratio (0.546±0.006), Ellipticity (1.854±0.020), Elongation (0.296±0.005) and Form (817.46±2.85 µm2 /pixel2). These findings indicated that the complete sperm morphometry engaging derived morphometric indices can define the sperm head shape more accurately and can be used as a valuable supportive tool for further studies on indigenous boar semen morphology and sperm classification.

Basic seminal parameters like ejaculate volume, sperm concentration, live count, and progressive motility in Agonda Goan pigs were recorded and compared with LWY and crossbreds. Major parameters like ejaculate volume and sperm concentration were significantly lower (p≤ 0.05) in Agonda Goan pigs while reaction time and refractory period were significantly longer (p≤ 0.05) indicating that indigenous Agonda Goan pigs are difficult semen donors with poor libido. Standardized Artificial Insemination (AI) using liquid boar semen combined with controlled breeding involving estrus induction and synchronization was also carried out in the Institute and farmers' field. A total of 435 piglets were born through 96 numbers of AI and 63 numbers of farrowing with a success rate of 72% in the farmers' field during the period. Adoption of this technology has boosted pig production in farmers' field as a result of higher number of viable piglets and improved piglet growth rate. Around 76 numbers of pig farmers were benefited, generating overall employment of 22,609 man-days with income generation of ₹122.88 lakhs rupees.



Ultrasonogram of testicular perfusion analysis

Impact study of various technological interventions in breeding, feeding and other management aspects of backyard poultry farming

(Nibedita Nayak, Gokuldas PP , Susitha Rajkumar, Amiya R. Sahu and Monica Singh)

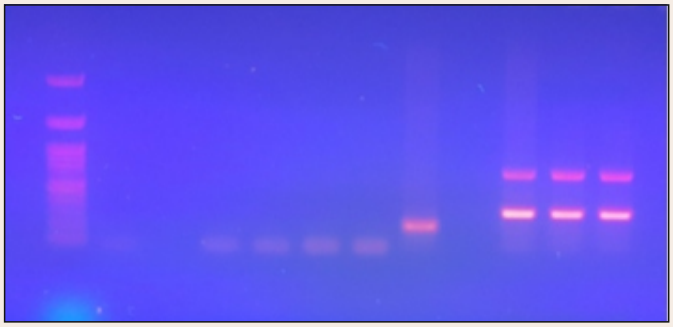
An impact study of various technological interventions in breeding, feeding and other management aspects of backyard poultry farming was done for 180 backyard poultry farmers from Goa, Karnataka and Maharashtra. The study revealed that there was a 33% increase in average poultry flock size with a 155% increase in the adoption of breeding practices. There was increase in 118-man days with own backyard poultry farming in addition to other agricultural activities. The average consumption of eggs had increased by 34 numbers and poultry meat by 6.4 kg over 2 years of study period. Awareness about vaccination schedules in poultry and skill improvement for doing vaccination has reduced various incidences of diseases in poultry. Nutrient requirement of poultry and feeding of supplementary feed were adopted by all farmers after feeding interventions like formulation of feed and use of addition of herbal feed additives. Considering the cost of production and return, the B:C ratio for rearing 10 birds increased to 2.21 from 1.82.

Mortality in breeder poultry due to concurrent infection with *S. pullorum* and ALV, MDV

(Susitha Rajkumar and Shirish D. Narnaware)

A mortality was reported in a breeder poultry farm at Goa during February to March 2023 in multiple flocks of age ranging from 2 to 28 weeks. The only clinical signs observed were reduced feed intake, soiled vent and listlessness prior to death and mortality of around 300 birds was noticed over period of 3 weeks. On post mortem examination congested lungs, enlarged, fragile liver and spleen with presence of diffuse white foci on liver, flabby immature ovarian follicles, enteritis and peritonitis with accumulation of yolk material in the abdomen. PCR using tissue DNA samples showed the samples were positive for ALV, MDV and Salmonella sp. Salmonella sp. could be isolated on Hekton enteric agar, which was confirmed by multiplex PCR as Salmonella enterica serovar Gallinarum biovar Pullorum. The 16srRNA gene was sequenced and analysed through NCBI BLAST, which showed 99.06% similarity to Salmonella enterica subsp. enterica serovar *gallinarum* strain SG1. The results showed that the mortality could be due to concurrent infection with *S. pullorum* and ALV, MDV and due to the immunosuppression induced by the viruses. The Salmonella infection might have occurred due to the introduction of infected chicks from an infected flock.

Poultry carcass showing enlarged liver with diffuse white foci



Multiplex PCR amplifying the *ybgL* and *stn* genes of S.

An outbreak of Foot rot and septicaemia due to Fusobacterium necrophorum and E. coli in herd of four horned antelope in Goa

(Susitha Rajkumar and Shirish D. Narnaware)

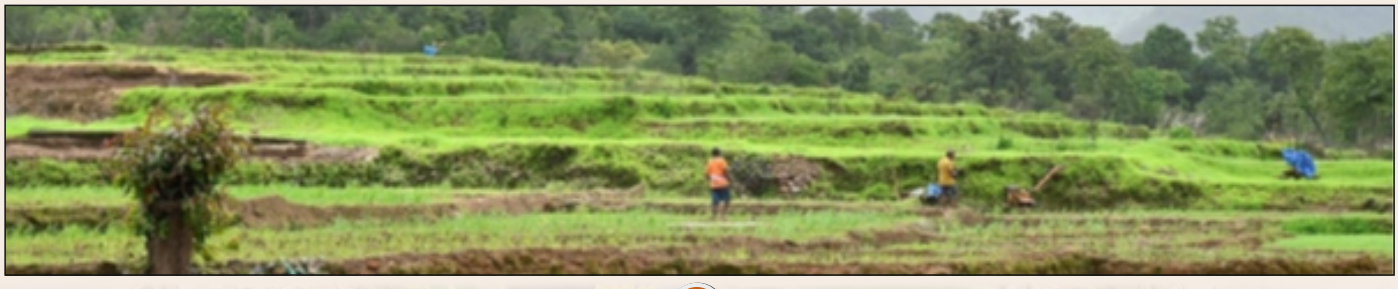
An outbreak of contagious foot rot was reported in a herd of Four horned antelopes (*Tetracerus quadricornis*) in a wildlife sanctuary at Goa during the month of February 2023, two deaths and clinical signs of anorexia, and limping were reported in few animals. Post mortem examination showed generalised congestion of skeletal muscles and viscera and presence of blood clots and multiple necrotic foci over the diaphragm, pleura and lungs. Microscopically lungs showed coagulative necrosis, alveolar edema, congestion and haemorrhage and skin showed zones of coagulative necrosis, inflammation, congestion, haemorrhage and thrombosis in the dermis. PCR targeting lktA gene could detect presence of F. necrophorum in tissue DNA from the interdigital skin, lung and liver. *F. necrophorum* and *E. coli* could be isolated from heart blood and were confirmed by PCR. Phylogenetic analysis showed that the F. necrophorum sequence from the present study GFN 1 grouped closely with isolates from Australia, China, Pakistan and Iraq and another Indian isolate from goat.

PCR amplification of lktA gene of *F. necrophorum*

Evaluation of the feasibility of operation and maintenance of agro-ecotourism center under public- private partnership mode

® Solomon Rajkumar, Vinod Ubarhande, Paramesha V., Shripad Bhat, Uthappa A. R. and Trivesh Mayekar)

Agro–ecotourism is the modern concept to boost tourism activity on farms. It offers scope for the integration of farming activities, the tourism industry and the farm business. It is one of the livelihood strategies to link tourism with agricultural services, products, and experiences to satisfy the needs of both farmers and tourists. The technology is being adopted by the stakeholders of the tourism industry (M/S Udbhav Vriksh, Goa) and the institute Agro-eco-tourism centre is being operational in a Public-Private-Partnership (P-P-P) mode and generated a revenue of ₹26 lakhs for five years. ICAR-CCARI initiated establishing a Community-Based Agro-Ecotourism model in Satorlim, Canacona Taluka, Goa as a part of Viksit Bharat's 100-day initiative aimed at fostering sustainable agricultural practices. A preliminary layout was developed to outline both primary and secondary agro-ecotourism activities.



NEW INITIATIVES

Reviving Wells, Revitalizing Lives: Water Security through PMKSY–WDC 2.0 Watershed development in Ponda Block

(Sujeet Desai, A. Raizada , Shripad Bhat and Uthappa A. R.)

Under the Pradhan Mantri Krishi Sinchayee Yojana - Watershed Development Component 2.0 (PMKSY-WDC 2.0), ICAR-CCARI, serving as the Project Implementing Agency (PIA) for the Ponda block in Goa, successfully revived two community wells that were in poor condition. One well at Palsare–Keri, catering to the domestic water needs of 25 families, and another at Kesarbai Kerkar School, benefiting about 300 students, were desilted, cleaned, and structurally strengthened through entry point activities. Following these interventions, both wells have shown remarkable improvement in water yield and quality, ensuring reliable access to safe water for the local community and the school. The initiative demonstrates an effective model of community-centric water resource rejuvenation for enhancing rural water security under integrated watershed management.

EVENTS

ICAR-CCARI celebrates 2023 as year of "*Mission Swachhta - 365*"

ICAR-Central Coastal Agricultural Research Institute, Goa celebrates year 2023 with the theme "Mission Swachhta - 365" to keep the campus and surrounding clean and green. This mission will run throughout the year with an aim of creating awareness about cleanliness. Dr. Parveen Kumar, Director of the Institute officially launched this event on 3rd January 2023. In his launching address, he highlighted the importance of this mission. He further urged all the staff to keep the campus clean and make CCARI Campus one of the cleanest campus in Goa. The activities planned in this mission are spreading the awareness of the mission, cleaning the office space and surroundings, to make working space, rooms, laboratories, units and all structures of the institute free from all obsolete/ unserviceable items. A committee has also been constituted to coordinate and execute all the activities of "Mission Swachhta - 365". All the permanent and contractual staff of the Institute participated in the launching ceremony.

Distribution of Brush Cutter Machine to Self Help Group of Schedule Tribes farmers of Goa

In the coastal region of the country, particularly in Goa, horticultural crops occupy about 64% of the total cropped area 165953 ha (45.95 %) with predominant crops like Cashew, Coconut, Arecanut and spices. Weed infestation is a major problem in the coastal area due to high rainfall leading to 33 % loss in yield. Hence, an attempt was made to popularize weed management through adaption of mechanization by providing brush cutter machine and train tribal farmer of Goa under Schedule Tribes Component. ICAR Central Coastal Agricultural Research Institute Goa has organized the Brush Cutter Machine distribution program to the Schedule Tribe farmer of Goa on 04-01-2023 under the Chairmanship of Dr. Parveen Kumar, Director and Dr. A. Raizada Head NRM & Principle Scientist (Agro Forestry). A total 90 Schedule Tribes farmers from 8 Schedule Tribes Self-Help Groups benefitted from this activity and will find it for effective weed management. Shashi Vishwakarma Senior Technical Officer (Soil Science) coordinated this programme. A total 18 representatives of Schedule Tribe farmers of 8 Self Help Group were present and received 8 Brush Cutter Machine (one brush cutter machine to each group) in the program.

ICAR-CCARI in collaboration with KVASU registers tribal women SHG-Micro Enterprise group "SAMSUDDHA"

ICAR-CCARI, Goa in collaboration with KVASU registered a tribal women SHG-Micro Enterprise group "SAMSUDDHA" (means "Pure" in Malayalam) on 12-01-2023 at Pattikad grama panchayat, Thrissur district of Kerala under aegis of Kudumbasree Mission of Govt of Kerala. This group is formed for production of value-added milk products from the Small Scale Dairy Processing Unit established at Vaniyampara Village of Coastal District of Thrissur under financial support from ICAR-Schedule Tribe Component under Chairmanship of Dr. Parveen Kumar, Director, ICAR-CCARI, Goa. Dr. R. Solomon Rajkumar, Senior Scientist and PI and Dr Sanjay Kumar Udharwar, SMS (Animal Sciences) represented ICAR-CCARI, Goa for registration of the SHG on behalf of the Director, ICAR-CCARI, Goa. SAMSUDDHA will be registered as a trademark and the value added products will be marketed under this trademark.

74th Republic Day celebration at ICAR-CCARI, Goa

ICAR-CCARI, Goa celebrated 74th Republic Day on 26th January 2023 with high spirit and enthusiasm. Dr. Parveen Kumar, Director of the institute unfurled the tricolor flag and expressed his gratitude to the farming community for serving the country. In his brief address to all the staff members of the institute, Director expressed his happiness about the various accomplishments of the Institute during the previous year. Director also stressed upon upscaling of various technologies of the institute to cater the farmer's needs. He outlined his vision for Mission Swacchata 365. Director also felicitated the contractual staff who have immensely contributed for the development of the institute. The program was coordinated by Mr. Shashi Vishwakarma, Farm Superintendent.

ICAR-CCARI ABI (AGNI) conducted two days Young Agri-entrepreneur's conclave at Goa

AGNI (Agri-based Growth opportunities for Nurturing startups through Incubation), the Agri-business incubation (ABI) centre of ICAR-Central Coastal Agricultural Research Institute (CCARI) Goa organized a two days "Young Agri-entrepreneurs Conclave 2023" from 31st January 2023 to 1st February 2023. This Young Agri-entrepreneurs' conclave was conceptualized to identify the best agri start-up ideas from the ignited young minds (below 40 years of age) to further nurture them through incubation support from AGNI. A total of 42 young entrepreneurs, students and farmers from 6 states (Goa, Maharashtra, Gujarat, Karnataka, Kerala and Tamil Nadu) registered for this program. The conclave was inaugurated by Smt. Swetika Sachan IAS, Director (Directorate of Industries, Trade, and Commerce), Govt. of Goa. During her inaugural address, she lauded the efforts of AGNI in promoting agri-entrepreneurship among

youth.

The start-up ideas were critically evaluated by esteemed panelists from academia and Industry. The best three startup ideas were awarded the AGNI trophy and the top 10 were awarded a one-year waiver for the incubation fee at AGNI. A team from RAFTAAR-ABI (R-ABI) of ICAR-CIRCOT Mumbai also participated in the program for future collaboration with the AGNI for Idea and seed-stage startup support. During the conclave

During the conclave, Dr. Parveen Kumar, Director, ICAR-CCARI, Goa assured that the AGNI will make all the best efforts to transform these ideas into industries with the larger goal of retaining youth in agriculture through entrepreneurship. The conclave was coordinated by Dr. Mathala Juliet Gupta, Senior Scientist & PI and Dr. R. Solomon Rajkumar, Senior Scientist& Co-PI of AGNI. Dr. Milind R Bhirud, Chief General Manager, NABARD, Goa region distributed the prizes to the participants during the valedictory session of the conclave.

ICAR-CCARI and NCDC jointly organized one-day training on "Seaweed Business by FFPO'S"

ICAR-CCARI, Goa, along with NCDC, Pune organized a one-day workshop programme on "Seaweed Business by FFPO'S" at Sal Training Hall KVK-ICAR Goa on 8th February, 2023. Hon. Minister for Cooperation, Govt. of Goa Shri Subhash A. Shirodkar was Chief Guest for the program. Dr. Parveen Kumar, Director, ICAR – CCARI Goa and Shri Dattaraj Dessai, RCS, Govt. of Goa also attended the program. A total of 130 participants attended the seaweed training programme including farmers, entrepreneurs and students. Hon. Minister for Cooperation, Govt. of Goa, Shri Subhash A. Shirodkar emphasized the role of cooperatives in development of local communities and promoting the seaweed aquaculture as entrepreneurship development with climate smart technologies saving nature and natural resources for future generation. Dr. Parveen Kumar, Director, ICAR highlighted the role of ICAR in agriculture development and importance of seaweed aquaculture along with its uses and economic value, which can be useful in the sustainable development of fisheries livelihood in Goa and coastal region. He assured full technical support from the institute for seaweed culture development activities in the State of Goa and coastal region. Col. Vinit Narayan, regional Director, NCDC, Pune explained the motto of organizing this workshop.

Technical session covered the series of lectures on seaweed aquaculture delivered by three

experts. Shri. Trivesh Mayekar, Scientist delivered lecture on Seaweed cultivation, culture techniques and recent technological advances, the status of seaweed aquaculture, its Global and Indian scenario, applications of seaweed, the import and export scenario and the commercially important seaweed species. Dr. Manohar Cathrine Sumathi, Principal Scientist, NIO delivered lecture on Post-harvest practices and processing of seaweed products and challenges of seaweed production, suitable sites for seaweed culture in Goa. She also showed pictorial information about different experiments being carried out to obtain better yield of seaweeds. Along with the culture and practical knowledge, she highlighted the research gaps and challenges that need to solved. The last session was taken by Dr. Ketan Chaudhari, Associate Professor, College of Fisheries, Ratnagiri on Financial viability and economics of seaweed business, PMMSY support and NCDC schemes for the promotion of cooperative business. The lecture was followed by the discussion session. The participants responded satisfactorily with the in-depth knowledge gained through the training program. Shri. Trivesh Mayekar, Scientist, Dr. Monika Singh, SMS and Dr. Sreekanth GB, Scientist along with NCDC team co-ordinated the training programme. Shri Vishwajeet Prajapati provided technical support during the training.

भाकृअनुप - केंद्रीय तटीय कृषि अनुसंधान संस्थान में राजभाषा कार्यशाला का आयोजन

भाकृअनुप - केन्द्रीय तटीय कृषि अनुसंधान संस्थान में दिनांक 03.02.2023 को हिन्दी कार्यशाला का आयोजन किया गया। इस कार्यशाला के वक्ता सुश्री ममता वेर्लेकर, गोवा विश्वविद्यालय की हिन्दी सहायक प्राध्यापक थी।

इस संस्थान की सह-राजभाषा अधिकारी श्रीमति श्रेया बर्वे ने कार्यशाला में उपस्थित सभी को संस्थान के इस वर्ष की चौथी कार्यशाला में स्वागत किया। माननीय निदेशक महोदय डॉ. प्रवीण कुमार ने इस कार्यशाला की मुख्य वक्ता को पुष्पगुच्छ एवं स्मृति चिन्ह देकर स्वागत किया। सुश्री ममता वेर्लेकरजी ने अपने संबोधन में कहा की भाषा के बिना मनुष्य अधूरा है और अपने इतिहास तथा परंपरा से वंचित है। मानव इतिहास में भाषा का अत्यंत महत्वपूर्ण स्थान रहा है, जो मानव सभ्यता के विकास, सामाजिक चेतना, पारंपरिक ज्ञान का संचार आदि में

महत्वपूर्ण भूमिका निभाती है। भाषा के माध्यम से इंसान अपने विचारों को दूसरे व्यक्ति तक पहुंचाकर, अपने इतिहास को संरक्षित कर पाया है। भाषा को नियमित इस्तेमाल न करने पर भाषा विलुप्त हो जाने की संभावना बन सकती हैं।

हिन्दी भाषा पर प्रकाश डालते हुए उन्होने कहा की, हिन्दी विश्व में तीसरी सबसे ज्यादा बोले जाने वाली भाषा है । हिन्दी भारतवर्ष की राजभाषा होने के साथ ही ग्यारह राज्यों और तीन केंद्र शासित क्षेत्रों की भी प्रमुख राजभाषा है। उन्होंने सबको सचेत किया कि कृत्रिम बुद्धिमता एवं इलेक्ट्रॉनिक मीडिया ने भाषा की संवेदनशीलता एवं बारीकियों को धीरे धीरे विलुप्त कर रहा है । अत: भाषा के नींव से जुड़े रहने के लिए हमे एवं हमारी आने वाली पीढ़ियों को जागरूक रहने की आवश्यकता है ।

इस कार्यशाला में संस्थान के 20 कर्मचारियों ने भाग लेकर लाभ उठाया। कार्यशाला के अंत में सह राजभाषा अधिकारी,

PMFME Sponsored Seed Capital SHG beneficiaries' training Programme

One day Seed Capital SHG Training was conducted on February 28, 2023. A total of 18 beneficiaries from Bardez taluka of North Goa attended the same.

The beneficiaries were trained on various aspects like the overview of the PMFME, understanding supply chain in food processing industries etc., a brief mention of other government of India Schemes supporting food processing enterprises, procurement of machinery & raw material, storage, transportation, recruitment & staff, food domains under PMFME scheme, value addition, raw material, choosing right tools/ equipment/machineries as per capacity by Dr. Mathala Gupta, Senior Scientist, ICAR-CCARI, Mr. Pravin Sabnis from Unlearning Unlimited organization Panaji trained then on motivation, inventory management: record keeping of daily transactions, how to maintain purchase register, sales register, working capital management line working capital decisions, cash in hand for emergency etc. Basics and benefits of FSSAI Registration & Licensing, Schedule IV – FSSAI (GMP, GHP, GLP practices including requirement for testing of food products) Udyam registration, GST & PAN were taught by Mrs. Nausin Mulla, Food Safety Officer, Directorate of Food and Drugs Administration, Bambolim, Goa. A brief review of packaging with different packaging methods & machines was covered by Er. Vinod Atkari, Assistant Professor (Agri. Engg). Goa College of Agriculture. This was followed by hands on training at post-harvest lab and Virgin Coconut Oil Unit, by Dr. Mathala Juliet Gupta & Mrs. Sunetra Talaulikar.

ICAR-CCARI, Goa established a Small – scale Demonstration Unit for Ornamental Fish Culture for the skill development of Fish farmers of Goa

ICAR-CCARI, Goa established a small-scale Ornamental Fish cultureunit for the skill development of fishermen's at Divar Island. The Demonstration unit for Ornamental Fish culture was inaugurated on 17th February 2023 at Divar Island, North Goa in the presence of Dr. MilindBhirud (General Manager), NABARD, Dr. A. Raizada, Director In-charge ICAR-CCARI Goa, Dr. Sushil Naik, (DDM),NABARD, Dr. Sonali Bandekar, (AGM), NABARD and the SHG members.This unit was established under a project for the development and livelihood improvement of fisherman through training & demonstration of ornamental fish culture with funding support of NABARD.

A group of 20 fishermen from Divar Island, Goa were benefitted with the knowledge on various ornamental fish culture systems and this management. Chief guest Dr. Milind Bhirud (GM) NABARD highlighted the NABARD activities for promoting entrepreneurship development in Goa. Also he explained the importance of Ornamental Fisheries in livelihood promotion.Dr. A. Raizada Director Incharge highlighted the potential of ornamental fish culture as a livelihood option and contribution of the sector to the growth of country during his inaugural address. He also assured full technical support from the institute for fisheries development activities for the State of Goa. Dr Sushil Naik, (DDM), NABARD spoke on the methods through which how SHGs can promote themselves with these activities. Dr Sonali Bandekar highlighted the importance of ornamental aquaculture in Goa. Dr. Shirish Narnaware, Section In-charge, (Animal and Fishery Science) emphasized upon the role of the local community andSelfHelp Group in promoting ornamental fish culture as an income source. Shri. Trivesh Mayekar, Scientist highlighted the project activities and its objectives. He also mentioned series of similar Demonstration unit will be set up under this scheme for the benefit of fishermen in Goa. Members of the SHGs expressed their thanks to NABARD and ICAR for helping and promoting their livelihood. Shri. Trivesh Mayekar, Scientistco-ordinated the programme. Shri Vishwajeet Prajapati provided technical support during the function.

ICAR-CCARI, Goa organized interface meeting with Goa Bagayatdar Sahkari Vikri Kharedi Society

A one-day meeting for discussion on 'Challenges faced in Horticulture/Agriculture in Goa owing to constant climate changes with a specific focus on cashew cultivation' was organized by ICAR-CCARI, Goa on 28-02-2023 for the Goa Bagayatdar Sahkari Vikri Kharedi Society (GBSVKS), Goa. Chairman of GBSVKS, Adv. Shri Narendra Keshav Sawaikar, Chairman, Managing Director and Board of Directors of GBSVKS, Director and Scientist of ICAR-CCARI, Old Goa and Senior Scientist and Head, and Subject Matter Specialist, KVK, North Goa attended the programme. Goa Bagayatdar envisaged that there are perceptible changes in the marketing of cashew and climate change in one important noticeable factor. Consequent to a request by Goa Bagayatdar for discussion on the topic, the Institute organized a meeting to deliberate on it. Dr. Parveen Kumar, Director, ICAR-CCARI highlighted upon the productivity gaps in the major crops of the State of Goa and explained the reasons for low productivity. He further ensured whole-hearted support and technology backstopping for the problems that are faced by the farmers and raised by GBSVKS. Adv. Narendra Keshav Savaikar, Chairman, GBSVKS raised several problems faced by a farmer of Goa due to climate change and urged to provide technological backstopping. He also ensured to disseminate the technical input to farmers through Goa Bagayatdar. Dr. A. R. Desai, Principal scientist (Horticulture) delivered a presentation on 'Horticulture /cashew cultivation in Goa'. He presented in detail the strategies for climate-resilient cashew cultivation in the State of Goa and the technologies that are developed by the Institute. Dr. Bappa Das, Scientist (Agriculture Meteorology) delivered a presentation on 'Impact of climate change on Agriculture'. He deliberated on the technologies like integrated farming systems, rainwater harvesting, soil and water conservation, and climate-smart varieties, etc. that are developed by the Institute and available for further dissemination. The Board of Directors and officials of GBSVKS raised queries for discussion of the topic and technical experts from ICAR-CCARI responded to it. "Such a stakeholders meeting is indicative and suggestive for potential research areas that could be certainly taken up as a research programmes in the future", Director said.

ICAR-CCARI, Goa inks MoU with National Innovation Foundation, Gandhinagar to foster collaboration in carrying out advanced research

ICAR-Central Coastal Agricultural Research Institute (ICAR-CCARI), Goa signed a Memorandum of Understanding (MoU) at the Institute with the National Innovation Foundation (NIF), Gandhinagar, Gujarat on 9th March 2023 to foster collaboration in carrying out advanced research.

Dr. Parveen Kumar, Director, ICAR-CCARI, Goa emphasised that this MoU will have a synergistic impact and the collaborations will be fruitful for carrying out advanced research in areas of validation and value addition of outstanding indigenous practices. Dr. Vipin Kumar, Chief Innovation Officer & Director, NIF, Gandhinagar highlighted that the NIF aims to strengthen outstanding traditional knowledge through scouting, supporting and spawning grassroots innovations. Dr. R. Solomon Rajkumar, Senior Scientist, ICAR-CCARI, Goa presented a brief note on the research activities of ICAR-CCARI. Dr. R. K. Ravikumar, Scientist-E (Value Addition Research & Development/IPR), NIF, Gandhinagar highlighted various activities of NIF. There was also an interaction and discussion among Scientists of ICAR-CCARI, Goa and NIF, Gandhinagar during this ceremony. The MoU will be valid for three years.

Innovative Kulaghar farmer of Goa Shri Sanjay Anant Patil nominated by ICAR-CCARI, Goa conferred with IARI –Innovative Farmer Award 2023

Shri Sanjay Anant Patil (58), an innovative farmer from Goa has been conferred with the coveted IARI –Innovative Farmer Award 2023 by the ICAR-Indian Agricultural Research Institute (IARI) New Delhi for his outstanding contributions to Natural Farming and zero-energy micro-irrigation system. He received the award at the hands of Shri Kailash Choudhary, Hon'ble Union Minister for State, Ministry of Agriculture and Farmers' Welfare, Govt. of India on 4th March 2023 at New Delhi in the presence of Dr. Himanshu Pathak, Director General, ICAR and other officials of ICAR.

Shri Sanjay Patil is a green revolutionary, known to many as the 'one-man-army' because he single-handedly transformed a barren plot of land measuring ten acres, into a lush green natural farm (Kulaghar) with technical guidance from ICAR-CCARI, Goa. Even though he is having formal school education up to the 11th class but he possesses the knowledge and skills of a top engineer when it comes to water conservation and natural farming practices using Jeevamrut produced from Indian breed cow dung and he is an inspiration to small farmers in the state of Goa.

A team constituted by the Director, ICAR-CCARI, Goa visited the farmer, documented his technologies through good quality photographs, and prepared the application for the nomination of IARI –Innovative Farmer Award 2023. Shri Sanjay Patil profusely expressed his gratitude to Dr. Parveen Kumar, Director, ICAR-CCARI, Goa and his team for recognizing his hard work and innovation. Dr. Pramod Sawant, Hon'ble Chief Minister of Goa congratulated Shri Sanjay Patil for his outstanding achievement.

ICAR-CCARI, Goa attended Honourable PMs address in a two-day international conference on Millets

ICAR-Central Coastal Agricultural Research Institute and KVK, North Goa attended the address of the Hon'ble Prime Minister of India at the two-day international conference on 'Enhancing productivity and value-addition to Millets' organized by Ministry of Agriculture and Farmers' Welfare at the National Agricultural Science Complex (NASC Complex) on 18th March 2023. A total of 50 farmers', staff of the Institute, and other stakeholders participated in the program. The deliberation of the Hon'ble Prime Minister, the vital role of millets in improving global food and nutritional security and achieving sustainable development goals (SDGs) enlightened farmers and staff to take the initiative on the promotion of millets through research and extension.

ICAR-CCARI, Goa conducted "Skill Development and Poultry Entrepreneurship Training cum Demonstration" jointly with CPDO (WR), Mumbai

A six days training cum demonstration programme on "skill development and poultry entrepreneurship" was conducted at ICAR-CCARI, Goa jointly with CPDO (WR), Mumbai during 24-29 March, 2023. The training was attended by 21 farmers from different parts of Goa. In the inaugural address, Dr. Parveen Kumar, Director emphasized on importance of skill development and poultry entrepreneurship for farmers and youths of Goa. He also interacted with the trainees about their expectations from the training. The programme consisted of fourteen lectures on different aspects of poultry farming including lectures on economics and project preparation too. Six practical demonstrations were conducted including visits to Poultry Unit (ICAR-CCARI, Goa), State Govt. Poultry Farm, Ela, and to the farmers' fields at Ponda, Goa. Dr. Tushar Gaunekar, I/C State Govt. Poultry Farm, Ela described the routine poultry farm activities and hatchery facilities to the trainees during the visit to the State Govt. Poultry Farm. Dr. Amiya R. Sahu, Scientist (Animal Genetics and Breeding) explained different breeds of poultry, their important characteristic features and breeding strategies. Dr. Rama Parab, I/C STC, Kurti, Ponda, Goa delivered a lecture on poultry farming related schemes and subsidies available for the farmers by Dept. of Animal Husbandry and Veterinary Services, Govt. of Goa. Two practical demonstrations were performed on vaccinations, biosecurity measures, sexing of birds, litter management, etc. by Dr. Neha Joshi, Farm Manager (CPDO, Mumbai) and Nibedita Nayak, Scientist (Poultry Science). Dr. Gokuldas P.P. delivered a lecture on semen collection and artificial insemination in poultry. Dr. Shirish Narnaware (I/C, Animal and Fisheries section) and Dr. Susitha Rajkumar, Senior Scientist (Vet. Pathology) delivered insightful lectures on bacterial and viral diseases of poultry, their diagnosis and management and preventive measures. A lecture on value addition of poultry products, their packaging and marketing was

given by Dr. R.S. Rajkumar, Senior Scientist (Livestock Products and Technology).There was an interactive session by the trainees with the scientists and knowledge shared by co-learning. During the valedictory session, three cash prizes given to the winners of quiz competition conducted at end of the training programme and certificates distributed to all the participants. The training was coordinated by Dr. Neha Joshi, Dr. Nibedita Nayak, Dr. Shirish Narnaware and Dr. Amiya Ranjan Sahu. The technical assistance was rendered by Mrs. Pranjali Wadekar, Mr Vishwajeet Prajapati, Mrs. Atasha and Miss Tejashvi.

ICAR-CCARI Goa celebrated its 34th Foundation Day

The ICAR – Central Coastal Agricultural Research Institute, Old Goa, Goa celebrated its 34th Foundation Day on 1st April 2023. As a Chief Guest, Dr. Suresh Kumar Chaudhari, Hon'ble DDG (NRM), ICAR, New Delhi, graced the occasion. In his remarks, he congratulated the Institute for its achievements and urged it to keep up the research and development for the benefit of the coastal farmers. Further, he highlighted the emerging issues of the coastal ecosystem and stressed the need to cope with the challenges of climate change and its impacts. 'The biodiversity of coastal regions is an enormous opportunity; we should utilize it sustainably', he highlighted. He appreciated the Government of Goa and DoA for taking necessary steps to make Goan agriculture vibrant by emphasizing agricultural education, extension, and research. He complimented the networking and the collaborations by ICAR-CCARI with the state line department, funding agencies, and stakeholders. He urged scientists to research natural farming by identifying niche commodities and areas. Dr. Parveen Kumar, Director, ICAR-CCAR, Goa and host of the programme welcomed the dignitaries and deliberated upon the achievements of the Institute since its inception and last one year. 'ICAR-CCARI will extend all its support through technological backstopping and transfer of technology programmes to all the stakeholders for the benefit of the coastal farmers' he assured. He thanked the ICAR and Hon'ble DDG for his continuous guidance and support to ICAR-CCARI. Special Guest, Shri. Nevil Alphonso, Director, Directorate of Agriculture, Govt. of Goa, congratulated ICAR-CCARI and thanked the ICAR and Institute for the support extended to initiating the Goa College of Agriculture and the very first agricultural college in the State. He emphasized taking a systematic and focused approach to promote the cultivation and processing of millet to celebrate the International Year of Millets 2023. Shri. Pradip Sarmokadam, Member Secretary, GSBB, Govt. of Goa, Special Guest, appreciated the collaborative efforts of the Institute to conserve and utilize biodiversity. He thanked the continuous support for the action plan preparation of the board and urged to support their activities by scientific backstopping. Shri. Milind Bhirud, General Manager, NABARD, Goa, Special Guest, emphasized strengthening the collaborative

efforts on research and development to benefit the farmers. A unit of ICAR - IARI's JalopcharTM Technology-based 'Eco-friendly Wastewater Treatment Facility' of capacity to treat 1 lakh Liter water under the Swachhta Action Plan Program was inaugurated by Dr. Suresh Kumar Chaudhari, Hon'ble DDG (NRM), ICAR, New Delhi. Developer of the technology, Dr. Ravinder Kaur, Principal Scientist, Water Technology Center, ICAR-IARI, New Delhi, coordinated the inauguration and explained the concept and functioning of the plant to the dignitaries and participants. The celebration of Foundation Day also featured a lecture by Dr. Jagannath V. Dixit, Professor, Department of Community Medicines, BJ Medical College, Pune, Maharashtra, on a plan and lifestyle to reverse type 2 diabetes. On occasion, the staff and employees of the Institute were felicitated with awards in scientific, technical, administrative, skilled support staff, and project staff categories to recognize their significant contribution to the research and institution-building activities. Two special team awards were awarded to teams of the scientist who contributed significantly to converting the barren lands to green lands through systematic transfer of technology programmes and for admirable compilation of the farmers profile that led to one Padma, one national and two state level award to the farmers. One annual hind magazine Lehrein ( ) and seven extension folders were released during the programme. Guest invitees, officers from State line departments, CPWD, health sector, banks, farmers, etc. and press and media participated in the programme. Scientists, technical, administration, skilled support staff, YPs, project staff, and contractual staff of the Institute and Sr. Scientist and Head I/c, SMS and staff of KVK, North Goa attended the programme.

Dr. Jagannath Dixit delivered a talk on "A Dixits lifestyle to Reverse Obesity and Type 2 Diabetes"

Dr. Jagannath Dixit, Professor, B. J. Medical College, Pune, Maharashtra, delivered a talk on "A Dixits lifestyle to Reverse Obesity and Type 2 Diabetes" at ICAR-Central Coastal Agricultural Research Institute, Old Goa, Goa on 1st April 2023. The lecture was organized as a part of the celebration of the 34th Foundation Day of the Institute. Dr. Suresh Kumar Chaudhari, Deputy Director General (NRM), ICAR, New Delhi, introduced the speaker to the participants. He emphasized the traditional wisdom in today's lifestyle to keep us healthy. In his welcome address, Dr. Parveen Kumar, Director, ICAR-CCARI, stressed the role of lifestyle and diet plan in reversing type 2 diabetes. Dr. Jagannath Dixit deliberated upon the basics of diabetes, its types, and causes. He discussed in depth the Dixits lifestyle of diet plan and exercises to reverse type 2 diabetes. He has shared his experiences and examples of people who benefitted from this lifestyle. He supported the lifestyle results with scientific references. He urged the participants to 'Experiment and then experience and don't just believe'. He further appealed to the participants to share this knowledge to benefit the community and join this campaign. The talk was followed by interaction with the participants. Scientists, Technical staff, Administration staff, Skilled Support staff, staff of Krishi Vigyan Kendra and RA, SRF, JRF, and Project Assistants of the institute attended the programme in person. About 48 participants joined virtually, which included Directors of the Institute, staff, and family members.