वार्षिक प्रतिवेदन
ANNUAL REPORT

2024

भा.कृ.अनु.प. - केंद्रीय द्वीपीय कृषि अनुसंधान संस्थान
ICAR- Central Island Agricultural Research Institute

Sri Vijaya Puram-744105, Andaman & Nicobar Islands, India

Dr. Himanshu Pathak, Secretary, DARE & Director General, ICAR, New Delhi, inaugurated the Administrative-cum-Training Building of KVK, Nimbudera

DWEEP HARITHA

DWEEP SONA

The Ministry of Agriculture and Farmers Welfare, Government of India, has officially notified in the Gazette the release of two dwarf coconut varieties by ICAR-CIARI

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SRI VIJAYA PURAM -744105
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CONTENTS

प्रस्तावना

आईसीएआर-केंद्रीय द्वीपीय कृषि अनुसंधान संस्थान (सीआईईएआरआई), श्री विजयापुरम में चार प्रभाग हैं, अर्थात्, बागवानी और फसल सुधार, प्राकृतिक संसाधन प्रबंधन, पशु विज्ञान, मत्स्य विज्ञान, और मिनिकॉय, लक्षद्वीप में इसका एक क्षेत्रीय केन्द्र है। अंडमान और निकोबार द्वीपसमूह और लक्षद्वीप द्वीपसमूह के नाजुक पारिस्थितिकी तंत्र में रहने वाले कृषक समुदायों के लाभ के लिए कृषि और संबद्ध क्षेत्रों को बढ़ाने के लिए एक केंद्रित अधिदेश के साथ, संस्थान ने वर्ष 1978 में अपनी स्थापना के बाद से स्वयं को द्वीप-विशिष्ट अनुसंधान के क्षेत्र में अग्रणी के रूप में स्थापित किया है। पिछले कुछ वर्षों में, आईसीएआर-सीआईएआरआई ने चालीस फसल किस्मों को सफलतापूर्वक विकसित किया है, पांच अलग-अलग पशु और मुर्गी नस्लों को पंजीकृत किया है, और आठ नवोन्मेषी प्रौद्योगिकियों और उत्पादों को लाइसेंस दिया है, जिससे स्थानीय कृषक समुदाय को काफी लाभ हुआ है। वर्ष 2024 संस्थान के लिए एक महत्वपूर्ण मील का पत्थर साबित होने वाला है, जो राष्ट्रीय स्तर पर और द्वीप समुदायों के बीच सराहनीय उपलब्धियों और मान्यता की विशेषता रखता है, जिससे इन अद्वितीय और चुनौतीपूर्ण वातावरणों में कृषि और संबद्ध प्रथाओं को आगे बढ़ाने में इसकी आवश्यक भूमिका को बल मिलता है।

हमारे संस्थान ने बौद्धिक संपदा में महत्वपूर्ण प्रगति हासिल की है, जिसमें गैर-रैटाइट पक्षियों के लिंग का निर्धारण करने की एक विधि, फार्म के सूअरों से रक्त संग्रह की एक नई और सुरक्षित विधि, फार्म के जानवरों में चिचड़ी (टिक) नियंत्रण के लिए एक एसारिसाइड संरूपण, दालचीनी की छाल रगड़ने का उपकरण और एक बंद पानी परिसंचरण प्रणाली सहित नवोन्मेषी समाधानों के लिए पांच पेटेंट हासिल किए हैं। इसके अलावा, हमने छह और पेटेंट दायर किए हैं, जिसमें मक्खी-विकर्षक संरचना और इसकी तैयारी विधि, एयर लेयरिंग बैग, लटकती खेती संरचना, खरगोश मॉडल के लिए एक कृत्रिम गर्भाधान बंदूक (गन), खरगोश मॉडल के लिए एक कृत्रिम योनि और खरगोश वीर्य संग्राहक शामिल हैं। नवोन्मेषण के लिए हमारी प्रतिबद्धता द्वीपीय पारिस्थितिकीतंत्र के तहत स्लेटेड फर्श वाले बकरी आवास के लिए एक कॉपीराइट सहित पांच ट्रेडमार्क, अर्थात् द्वीप, वर्टिग्रो, द्वीपगौ मां रक्षक, द्वीपटिकुरे और द्वीपहन ग्रीन्स, दायर करने से भी प्रदर्शित होती है। 16 जुलाई, 2024 को, आईसीएआर के स्थापना दिवस के दौरान, हमें दो प्रौद्योगिकियों कार्प ग्रोवर फीड और पिगलेट एनीमिक के लिए आयरन सप्लीमेंटेशन के लिए प्रमाण-पत्र प्राप्त हुआ। नॉन-रैटाइट पक्षी के लिए लिंग निर्धारण किट और द्वीप टिक्योर की प्रौद्योगिकी का भी सफलतापूर्वक व्यावसायीकरण किया गया है, जो अंतिम उपयोगकर्ताओं तक पहुँचने के लिए हमारी विकसित प्रौद्योगिकी के व्यावसायीकरण को आगे बढ़ाने के लिए हमारी प्रतिबद्धता को रेखांकित करता है। सहभागी समुद्री पारिस्थितिकी तंत्र निगरानी के लिए विकसित एनआईसीएमआईएस (निकोबार तटीय प्रबंधन सूचना प्रणाली) नामक एक एंड्रॉइड एप्लिकेशन को औपचारिक रूप से आईसीएआर, नई दिल्ली द्वारा अनुमोदित किया गया है और माननीय सचिव, डेयर एवं महानिदेशक, आईसीएआर द्वारा इसका विमोचन किया गया है।

संस्थान ने साप्ताहिक आधार पर 100 से अधिक कृषि मौसम संबंधी परामर्श और 33 प्रभाव-आधारित पूर्वानुमान संबंधी परामर्श जारी करके द्वीप के किसानों की सहायता करने के लिए अपनी प्रतिबद्धता का प्रदर्शन किया है। ये साप्ताहिक परामर्श किसानों को मौसम की बदलती परिस्थितियों के अनुरूप एहतियाती उपायों को अपनाने के लिए सशक्त बनाते हैं, जिससे उनकी कृषि पद्धतियां बेहतर होती हैं। नवोन्मेषी कृषि प्रौद्योगिकियों के बारे में और अधिक जागरूकता बढ़ाने के लिए, संस्थान ने द्वीप और राष्ट्रीय दोनों स्तरों पर विभिन्न कार्यक्रमों का सक्रिय रूप से आयोजन किया है, जिसमें द्वीप किसान मेला, विश्व पशु चिकित्सा दिवस, विश्व मत्स्य दिवस, टिकाऊ पादप संरक्षण

कार्यनीतियों पर कार्यशाला (एसपीपीएस-2024), जलवायु अनुकूल द्वीप कृषि के लिए राऊंड टेबल बैठक, प्राकृतिक खेती के अवसर और चुनौतियों पर राज्य स्तरीय कार्यशाला आदि शामिल हैं। इन कार्यक्रमों ने मुख्य भूमि से गणमान्य लोगों को आकर्षित किया है और तीनों जिलों के किसानों को शामिल किया है, साथ ही द्वीप के छात्रों को मूल्यवान अनुभव उपलब्ध कराया है और कृषि में उद्यमशीलता के अवसरों को बढ़ावा दिया है। विशेष रूप से, आईसीएआर-सीआईएआरआई के क्षेत्रीय केन्द्र द्वारा मिनिकाय द्वीप में मछली एकत्रीकरण उपकरणों (एफएडी) के सफल विकास ने टिकाऊ समुद्री मछली पकड़ने की प्रथाओं में एक महत्वपूर्ण प्रगति को चिह्नित किया है, जिससे स्थानीय आदिवासी मछुआरों को पर्याप्त लाभ मिला है। यह पहल लक्षद्वीप तथा अंडमान एवं निकोबार के द्वीप समुदायों की विशिष्ट आवश्यकताओं के अनुरूप अनुसंधान एवं विकास के प्रयासों को आगे बढ़ाने में संस्थान की महत्वपूर्ण भूमिका को रेखांकित करती है।

मैं औपचारिक रूप से डॉ. हिमांशु पाठक, सचिव (डीएआरई) और महानिदेशक, आईसीएआर तथा डॉ. संजय कुमार सिंह, उप महानिदेशक (बागवानी विज्ञान) के प्रति हार्दिक आभार व्यक्त करना चाहता हूँ, जिन्होंने हमारे प्रयासों में हमें निरंतर सहयोग, व्यावहारिक मार्गदर्शन और प्रोत्साहन दिया। हमारा संस्थान डॉ. वी.बी. पटेल, सहायक महानिदेशक (फल और बागवानी फसलें), डॉ. विक्रमादित्य पांडेय, प्रधान वैज्ञानिक और एसएमडी (बागवानी विज्ञान) के समस्त स्टाफ की उनकी निरंतर सहायता और विशेषज्ञता के लिए अत्यधिक सराहना करता है।

इसके अतिरिक्त, हम अनुसंधान सलाहकार समिति (आरएसी), संस्थान प्रबंधन समिति (आईएमसी) और आंतरिक समीक्षा समिति (आईआरसी) सहित विभिन्न समितियों के अध्यक्ष और सदस्यों के प्रति, उनकी बहुमूल्य सलाह और सुझावों के लिए आभार व्यक्त करते हैं, जिन्होंने संस्थान के समग्र विकास और प्रगति में महत्वपूर्ण योगदान दिया है।

मैं अपने सभी कर्मचारियों के समर्पण और कड़ी मेहनत की भी सराहना करना चाहूँगा, जो हमारी उपलब्धियों में सहायक रही है। अंत में, मैं आईसीएआर-सीआईएआरआई की संपादकीय समिति के सदस्यों को इस प्रकाशन को निर्धारित समय-सीमा के भीतर तैयार करने के उनके प्रयासों के लिए भी हार्दिक धन्यवाद देता हूँ।

दिनांक: 20/जनवरी/2025

एकनाथ बा. चाकुरकर

निदेशक (भा.कृ.अनु.प - कें.द्वी कृ.अनु.सं)

Preface

The ICAR-Central Island Agricultural Research Institute (CIARI), Sri Vijaya Puram, encompasses four divisions, namely, Horticulture and Crop Improvement, Natural Resource Management, Animal Science, Fisheries Science, and one regional station at Minicoy, Lakshadweep. With a focused mandate to enhance the agricultural and allied sectors for the benefit of farming communities inhabiting the delicate ecosystems of the Andaman and Nicobar archipelago and the Lakshadweep Islands, the institute has established itself as a leader in island-specific research since its inception in 1978.Over the years, ICAR-CIARI has successfully developed forty crop varieties, registered five distinct animal and poultry breeds, and licensed eight innovative technologies and products, significantly benefiting the local farming community. The year 2024 is poised to be a pivotal milestone for the institute, characterized by commendable achievements and recognition at both national levels and among island communities, thereby reinforcing its essential role in advancing agricultural and allied practices within these unique and challenging environments.

Our institute has achieved significant advancements in intellectual property, securing five patents for innovative solutions including a method for determining the sex of Non-Ratite Birds, a new and safe method of blood collection from farm pigs, an Acaricide formulation for tick control in farm animals, a cinnamon bark rubbing tool, and a closed water circulatory system. In addition, we have filed six more patents, which encompass a fly-repellent composition and its preparation method, an air layering bag, a hanging cultivation structure, an artificial insemination gun for a rabbit model, an artificial vagina for a rabbit model, and a rabbit semen collector. Our commitment to innovation is further demonstrated by the filing of five trademarks, namely Dweep, Vertigrow, DweepGau Maa Rakshak, DweepTikure, and DweepHan Greens, along with one copyright for Goat housing with slatted flooring under the Island Ecosystem. On July 16, 2024, during ICAR's Foundation Day, we received certification for two technologies Carp Grower Feed and Iron supplementation for piglet anaemic. The technology for the Sex Determination Kit for Non-Ratite Birds,and DweepTickure, has also been successfully commercialized, underscoring our dedication to advancing the commercialization of our developed technologies to reach the end users. One android application named NICMIS (Nicobar Coastal Management Information System) developed for participatory marine ecosystem monitoring has been formally approved by ICAR, New Delhi and released by Hon'ble Secretary DARE and DG, ICAR.

The institute has demonstrated a commitment to supporting Island farmers through the issuance of over 100 agromet advisories and 33 impact-based forecast advisories on a weekly basis. These weekly advisories empower farmers to adopt precautionary measures tailored to evolving weather conditions, thereby enhancing their agricultural practices. To further enhance awareness of innovative agricultural technologies, the institute has actively organized various events at both the

island and national levels, including Island Kisan Mela, World Veterinary Day, World Fisheries Day, Workshop on sustainable plant protection strategies (SPPS-2024), Round table meeting for climate resilient Island agriculture, State level workshop on scope and challenges in natural farming etc. These gatherings have attracted dignitaries from the mainland and engaged farmers across all three districts, while also providing valuable exposure to island students and promoting entrepreneurial opportunities in agriculture. Notably, the successful deployment of Fish Aggregating Devices (FAD) at Minicoy Island by the Regional Station of ICAR-CIARI has marked a pivotal advancement in sustainable marine fishing practices, yielding substantial benefits for the local tribal fishermen. This initiative underscores the institute's vital role in driving research and development efforts tailored to the unique needs of island communities in Lakshadweep as well as Andaman and Nicobar.

I would like to formally express our heartfelt gratitude to Dr. Himanshu Pathak, Secretary (DARE) & Director General of ICAR, along with Dr. Sanjay Kumar Singh, Deputy Director General (Horticultural Science), for their unwavering support, insightful guidance, and encouragement throughout our endeavors. Our institute is also deeply appreciative of Dr. V.B. Patel, ADG (Fruits and Plantation Crops), Dr. Vikramaditya Pandey, Principal Scientist, and the entire staff of the SMD (Horticultural Science) for their consistent assistance and expertise.

Furthermore, we extend our gratitude to the chairman and members of various committees, including the Research Advisory Committee (RAC), Institute Management Committee (IMC), and Internal Review Committee (IRC), for their valuable advice and suggestions that have significantly contributed to the overall development and progress of the institute.

I would also like to acknowledge all our staff members' dedication and hard work, which has been instrumental in our achievements. Lastly, my sincere thanks go to the editorial committee members of ICAR-CIARI for their efforts in producing this publication within the stipulated timeframe.

Date:20/January/2025

Dr. Eaknath B. Chakurkar
Director

विशिष्ट सारांश

बागवानी और फसल सुधार प्रभाग

- संस्थान की किस्म विमोचन समिति के माध्यम से मालाबार इमली की दो उन्नत किस्में, द्वीप अग्रिम और द्वीप विशाल जारी की गईं।
- दो आविष्कार, अर्थात् बंद जल परिसंचरण प्रणाली और दालचीनी छाल रगड़ने का उपकरण, भारतीय पेटेंट कार्यालय में पंजीकृत किये गये।
- फील्ड परिस्थितियों में अंडमान कोकम के आठ, कोरंगी केले के पांच, दालचीनी के चौबीस, तथा तेजपात के छह संग्रह स्थापित किए गए।
- अंडमान कोकम के पौधों पर पर्ण पोषण (19:19:19) से कॉलर की मोटाई में महत्वपूर्ण सुधार देखा गया।
- द्वीपीय परिस्थितियों में ड्रैगन फल के प्रगुणन का अध्ययन किया गया, जिसमें आईबीए के प्रयोग से जड़ें जमाने में सहायता मिली, लेकिन कटिंगों में जड़ें जमाने के लिए यह आवश्यक नहीं था।
- गार्सिनिया प्रजातियों के बीजों में वसा की मात्रा जी. धनिखरीएंसिस > जी. गुम्मी-गुट्टा > जी. किडिया > जी. ज़ैंथोकाइमस > जी. काउवा के क्रम में पाई गई। गार्सिनिया प्रजातियों के अंतर-विशिष्ट ग्राफ्टिंग परीक्षण ने जी. गुम्मी-गुट्टा और जी. किडिया के लिए प्रकंद (रूटस्टॉक) के रूप में जी. धनिखरीएन्सिस की अनुकूलता का सुझाव दिया।
- सच्चे दालचीनी के चौबीस एक्सेशनों के मूल्यांकन से उपज और गुणवत्ता मापदंडों में महत्वपूर्ण अंतर का पता चला। दो साल के विश्लेषण के दौरान कौमारिन के बिना किसी शिखर वाले एक्सेशन को देखा गया।
- आईसीएआर-एनबीपीजीआर, नई दिल्ली से दालचीनी के चौबीस संग्रहों और तेजपात के छः संग्रहों के लिए एक्सेशन संख्या प्राप्त की गई।
- लौंग की छह चयनित पौध संतानों का उपज, रूपात्मक और जैव रासायनिक मापदंडों के लिए मूल्यांकन किया गया, जिससे महत्वपूर्ण अंतर सामने आए। यूजेनॉल और अन्य जैव सक्रिय तत्वों में भी भिन्नता देखी गई।
- द्वीपों के विभिन्न भागों से पाइपर सरमेंटोसम के छह संग्रहों को बड़े पैमाने पर प्रगुणित किया गया, और एक मूल्यांकन ब्लॉक स्थापित किया गया। संग्रहों में पत्ती, पादप वृद्धि और फल मापदंडों में भी भिन्नता देखी गई।
- औषधीय दृष्टि से महत्वपूर्ण अरण्य जीरका (सेंट्राथेरम एंथेलमिंटिकम) की नर्सरी तैयार करने के लिए, बीज उपचार के रूप में जीए$_3$ (500 पीपीएम) और सब्सट्रेट के रूप में वर्मीकम्पोस्ट के उपयोग की सिफारिश की गई थी।

प्राकृतिक संसाधन प्रबंधन प्रभाग

- 1 हेक्टेयर से नारियल + बकरी-आधारित आईएफएस मॉडल ने 10900 नट/हेक्टेयर/ वर्ष की नारियल समतुल्य उपज के साथ 1.82 लाख रुपये की शुद्ध आय दर्ज की और 190 मानव दिवस का रोजगार सृजन किया।
- चावल की जैविक खेती (सीआईएआरआई धान-7) से पता चला है कि हरी खाद, हरी पत्ती खाद और अजोला तथा पंचगव्य छिड़काव के माध्यम से 100% नाइट्रोजन के प्रयोग से 3.46 टन/हेक्टेयर की उच्च अनाज पैदावार दर्ज की गई, जो अजैविक उर्वरकों के माध्यम से 100% आरडीएफ (4.12 टन/हेक्टेयर) की तुलना में 16 प्रतिशत कम है।
- चावल की प्राकृतिक खेती परियोजना के अंतर्गत, जैविक खेती और जैविक+प्राकृतिक खेती दोनों में प्राकृतिक खेती (3.17 किग्रा/हेक्टेयर) की तुलना में क्रमशः 3.65 और 3.42 टन/ हेक्टेयर की अधिक उपज दर्ज की गई।
- जिला स्तर पर 100 कृषि मौसम संबंधी और 33 प्रभाव-आधारित पूर्वानुमान परामर्श जारी किए गए।
- बैंगनी गूदे वाली बड़ी रतालू किस्म श्री नीलिमा ने अधिक उपज (22.42 टन/हेक्टेयर) दर्ज की, जिसके बाद TGy 20-2 किस्म का स्थान रहा।
- कोलोकेसिया एस्कुलेन्टा के उन्नीस एक्सेशनों को आईसीएआर-एनबीपीजीआर, नई दिल्ली में जमा किया गया, तथा आईसी संख्या (653033 से 653051) प्राप्त की गई।
- पी. लेराम, पी. टेक्टोरियस और पी. ओडोरिफ़र के लिए विशिष्टता एकरूपता और स्थिरता (डीयूएस) विश्लेषण किया गया।
- बड़े रतालू (डायस्कोरिया आलता) जिसे आमतौर पर निकोबारी आलू कहा जाता है, के छीलने की गतिविधि के दौरान छीजन को कम करने के लिए लहरदार और असमान कंदों से छिलके को हटाने के लिए एक छोटा सा उपकरण "द्वीप निकोबारी आलू

पीलर" डिज़ाइन किया गया।

- पांडनस लेरम फलों के रेशेदार फल कीज से फल का गूदा निकालने के लिए एक छोटा सा उपकरण "द्वीप-पांडनस फल गूदा निकालने वाला" डिज़ाइन किया गया।
- अंडमान पेडौक (पेरोकार्पस डाल्बर्गियोइड्स) छाल मेथनॉल अर्क के फाइटोकेमिकल घटक कुल 131 घटकों से उत्पन्न हुए, जिनमें से 24 वर्ग के फाइटोकोन्स्टिट्यूएंट्स 84.59% क्षेत्र का निर्माण करते पाए गए।
- अद्वितीय उच्च पर्ण-उत्पादक पांडन एक्सेशन (पांडनस एमारिलिफोलियस) को कार निकोबार द्वीप समूह के मलक्का गांव (आईएनजीआर 24069) से एकत्र किया गया था, और भारत के निकोबार द्वीप समूह से इस अद्वितीय बड़े आकार के पत्ते (मैकरांगा निकोबारिका, आईएनजीआर 24083) जीनप्ररूप को आईसीएआर में पंजीकृत किया गया था।
- आईसीएआर-सीआईएआरआई द्वारा जारी की गई दो बौनी नारियल किस्में (द्वीप हरिता और द्वीप सोना), को सरकारी राजपत्र में, कृषि और किसान कल्याण मंत्रालय, भारत सरकार द्वारा अधिसूचित किया गया।
- उत्तर, मध्य और दक्षिण अंडमान जिलों के विभिन्न स्थानों से फलों और सब्जियों के कुल 210 नमूने एकत्र किए गए और इन्हें नाशीजीवनाशी अवशेष विश्लेषण के लिए निर्यात निरीक्षण एजेंसी (ईआईए) प्रयोगशाला, कोलकाता को भेजा गया।

पशु विज्ञान प्रभाग

- 189 अंडमानी बकरियों के सीरम विश्लेषण से पता चला कि उच्च प्रजनन क्षमता वाले समूह की तुलना में कम प्रजनन क्षमता वाले समूह में आईजीएफ1आर का स्तर काफी अधिक था। इसलिए, आईजीएफ1आर को अंडमानी बकरियों में प्रजनन क्षमता के लिए एक शक्तिशाली सीरम बायोमार्कर माना जा सकता है।
- बकरियों में इष्टतम प्रजनन क्षमता के लिए राशन को मानकीकृत किया गया क्योंकि 20% अधिक प्रोटीन और 20% अधिक ऊर्जा अनुपूरण के संयोजन से अंडकोष और वृषण बायोमेट्रिक्स, कामेच्छा, प्रतिआक्सिकारक, हार्मोन और वीर्य की गुणवत्ता प्रोफाइल में सुधार हुआ।
- 500 µg मोरिंगा ओलीफेरा पत्ती अर्क/150 × 10^6 शुक्राणुओं के अनुपूरण ने टेरेसा बकरे के वीर्य की गुणवत्ता प्रोफ़ाइल में सुधार किया।
- उष्णकटिबंधीय आर्द्र द्वीप के पारिस्थितिकी तंत्र में अंडमानी बकरियों की तुलना में टेरेसा बकरियों में तुलनात्मक प्रजनन मापदंड बेहतर थे।
- दक्षिण अंडमान जिले के विभिन्न भागों से चारा, खाद, सब्जियाँ, दूध, दही, चिकन खुदरा दुकान, मछली और बकरी के मांस जैसे कुल 166 नमूने एकत्र किए गए और विभिन्न रोगजनकों के विलगन के लिए उनकी जाँच की गई। ई.कोली (n=40) का विलगन सबसे अधिक पाया गया, उसके बाद के.न्यूमोनिया (n=37), साल्मोनेला प्रजाति (n=32) और स्टैफिलोकोकस प्रजाति (n=26) का विलगन पाया गया। बैक्टीरिया से दूषित होने वाली आम सब्जियाँ धनिया, फूलगोभी, पालक और गाजर थीं।
- ब्रुसेला एबॉर्टस एंटीबॉडी की उपस्थिति के लिए रोज बंगाल प्लेट टेस्ट द्वारा कुल 200 मवेशी सीरा नमूनों की जांच की गई। कोई भी नमूना सकारात्मक नहीं पाया गया। पेस्ट डेस पेटिट्स रूमिनेंट्स वायरस एंटीबॉडी (पीपीआरवी) की उपस्थिति के लिए जांचे गए 182 बकरी सीरा नमूनों में से कोई भी नमूना सकारात्मक नहीं पाया गया। रिपोर्टिंग अवधि के दौरान, बकरियों में 9.4% की आक्रमण दर के साथ संक्रामक एक्टीमा (ओआरएफ) के तीन प्रकोप और 7.4% की आक्रमण दर के साथ केसियस लिम्फैडेनाइटिस के एक प्रकोप की सूचना दी गई।
- बकरियों और भेड़ों में केसियस लिम्फैडेनाइटिस के लिए कारक जीव कोरिनेबैक्टीरियम स्यूडोट्यूबरकुलोसिस का आणविक लक्षण वर्णन 16S rRNA और RNA पॉलीमरेज़ β सबयूनिट (rpoB) जीन अंशों की अनुक्रम जानकारी के आधार पर किया गया था। कुल 13 विलगनकों की पुष्टि की गई और rpoB-आधारित फ़ायलोजेनेटिक विश्लेषण ने संकेत दिया कि विलगनक कोरिनेबैक्टीरियम स्यूडोट्यूबरकुलोसिस बायोवर ओविस से संबंधित थे।
- बकरी सुधार पर अखिल भारतीय समन्वित अनुसंधान परियोजना के तहत, जन्म के समय, 3, 6, 9 और 12 महीने की उम्र में शरीर के वजन (किलोग्राम) का कुल न्यूनतम वर्ग औसत क्रमशः 1.45± 0.17, 6.16± 0.32, 10.03± 0.12, 12.55± 0.11 और 16.37± 0.12 था। प्रति पशु प्रति वर्ष शुद्ध आय 5669.4 रुपये पाई गई।
- फील्ड स्तर पर बकरियों में पॉलीहर्बल एकारिसाइड का मूल्यांकन

किया गया और इसने राइपीसफेलस माइक्रोप्लस संक्रमण के विरुद्ध 100% की प्रभावकारिता दर्शाई।

- दूध उत्पादन और किसान की आय पर सीआईएआरआई प्रौद्योगिकी ''द्वीप हम्पसोर गौ माँ रक्षक" के प्रभाव को मापा गया। दूध उत्पादन में औसत वृद्धि 0.61 लीटर थी, जो ₹71 प्रति लीटर की औसत बिक्री मूल्य पर, इस प्रौद्योगिकी का उपयोग करने वाले किसानों के लिए प्रति वर्ष प्रति पशु ₹10,120 का शुद्ध वृद्धिशील लाभ उत्पन्न करती है।

मत्स्य विज्ञान प्रभाग

- अंडमान एवं निकोबार द्वीपसमूह में जीवाणु, परजीवी, फफूंद तथा जल गुणवत्ता संबंधी समस्याओं जैसे संक्रामक एवं गैर-संक्रामक रोगों के कारण मछलियों में कुल मिलाकर इक्कीस रोग के मामले सामने आए।
- तीन समुद्री शैवाल प्रजातियों जैसे कि ग्रेसिलेरिया एडुलिस, पैडिना टेट्रास्ट्रोमैटिका और हैलिमेडा ओपंटिया में जैवसक्रिय यौगिकों की पहचान की गई और उनका लक्षण-वर्णन किया गया, जिसमें पॉलीसैकराइड, अमीनो एसिड, एल्केन, फॉस्फीन, एरोमैटिक एमाइन, लिग्निन, फॉस्फोलिपिड, कार्बोक्जिलिक एसिड, फैटी एसिड और खनिज शामिल हैं।
- अंडमान और निकोबार द्वीप समूह के मीठे जल में जलजीवपालन में रोगाणुरोधी प्रतिरोध (एएमआर) की गतिशीलता और निगरानी की जांच करने के लिए एक व्यवस्थित अध्ययन शुरू किया गया है। एएमआर की व्यापकता को समझने के लिए, अध्ययन एस्चेरिचिया कोली, स्टैफिलोकोकस प्रजातियां और एरोमोनस प्रजातियां जैसे लक्षित जीवों पर केंद्रित होगा।
- जनजातीय परिषद कार्यालय के सहयोग से कार निकोबार के बिग लापैथी गांव में पहला विज्ञान, प्रौद्योगिकी और नवोन्मेषण (एसटीआई) केंद्र स्थापित किया गया। कार निकोबार के जनजातीय मछुआरों के बीच आईसीटी उपकरणों के उपयोग को बढ़ावा देने के लिए एनआईसीएमआईएस मोबाइल एप्लिकेशन विकसित किया गया।
- मानसून-पूर्व अवधि (फरवरी से मई 2024) के दौरान चिड़ियापाटू संरक्षित खाड़ी में दो प्रजातियों ग्रेसिलेरिया एडुलिस और एकेंथोपोरा स्पाइसीफेरा के लिए समुद्री शैवाल की खेती का सफलतापूर्वक परीक्षण किया गया।
- ए. पैनिक्युलेटा के परजीवी-रोधी प्रभाव का पाले (इन-विट्रो) परीक्षण आर्गुलस जैपोनिकस के विरुद्ध जलीय अर्क के प्रयोग से पता चला कि 150, 200, 250, और 300 पीपीएम पर परीक्षण घोल के प्रयोग से 120, 150, और 180 मिनट पर 90 से 100 प्रतिशत मृत्यु दर हुई।
- अंडमान और निकोबार द्वीपसमूह में कुल 1,560 तालाब-संबंधी डेटा को द्वीप जियोपोर्टल में लाया गया, जहां जियो-सर्वर में छवि विज़ुअलाइज़ेशन की सुविधा के लिए ओपन लेयर इंटरफ़ेस के माध्यम से एक WMS सेवा विकसित की गई।
- 4 मीटर व्यास और 10,000 लीटर की क्षमता वाला एक बायोफ्लोक टैंक बनाया गया और टैंक में 3000 की दर से पेनेअस वन्नामेई पीएल-10 के झींगा बीज डाले गए। 90 दिनों के संवर्धन से कुल 15 किलोग्राम झींगा प्राप्त हुई।
- मुगिलोगोबियस चूले, एक मीठे पानी का गोबी, और एसोमस डैनरिका नामक साइप्रिनिड मछली को पहली बार अंडमान और निकोबार द्वीप समूह में दर्ज किया गया है, तथा उनके आंशिक सीओ1 जीन का लक्षण-वर्णन किया गया है।
- 'द्वीप-कार्प ग्रोवर फीड' प्रौद्योगिकी को आईसीएआर, नई दिल्ली द्वारा 16 जुलाई, 2024 को प्रमाणित किया गया।
- जनजातीय मछुआरों के लाभ के लिए मिनिकॉय द्वीप, लक्षद्वीप पर एक मछली एकत्रीकरण उपकरण (एफएडी) सफलतापूर्वक लगाया गया।

फील्ड फसल सुधार एवं संरक्षण अनुभाग

- अंडमान और निकोबार द्वीप समूह के तीन जिलों से फील्ड और बागवानी फसलों के चवालीस जननद्रव्य एक्सेशन एकत्रित किए गए।
- अंडमान और निकोबार द्वीप समूह के बीस से अधिक एक्सेशनों के साथ आइवी लौकी (कोकिनिया ग्रैंडिस) फील्ड जीन बैंक की स्थापना की गई। सभी एक्सेशन आईसीएआर-एनबीपीजीआर को आईसी नंबर के आवंटन के लिए प्रस्तुत किए गए।
- कुल 226 चावल, 59 मूंग, और 44 उड़द के जननद्रव्यों का प्रगुणन और संरक्षण किया गया।
- दस उन्नत प्याज किस्मों का मूल्यांकन किया गया, जिनमें से ताजे वजन और क्लोरोफिल सामग्री के मामले में भीमा शुभ्रा का प्रदर्शन सर्वश्रेष्ठ रहा।
- तिल की छह किस्मों अर्थात् तिलातारा, तिलक, तिलारानी, कायमकुलम-1, टीएमवी-3 और टीएमवी-4 का मूल्यांकन

किया गया, जिनमें 50% पुष्पण के दिनों और 1000 बीज भार में महत्वपूर्ण अंतर देखा गया।

- स्नैप मेलन मूल्यांकन में सबसे अधिक सलाद वजन (268.9 ग्राम) वाले पीपी-13 की पहचान की गई, जिसके बाद आईसी647729 (260.8 ग्राम) का स्थान रहा।
- मैजिक (MAGIC) के माध्यम से विकसित छह उन्नत चावल वंशक्रमों ने अधिक उपज, बेहतर फसल सूचकांक और श्रेष्ठ पादप संरचना का प्रदर्शन किया।
- एमजी8-4-77-ई-45 सबसे अच्छा प्रदर्शन करने वाली शीघ्र पकने वाली किस्म थी, जिसकी उपज 5548.4 किग्रा/हेक्टेयर थी, जो चेक किस्म से 19% अधिक थी।
- उड़द और मूंग की दाल के मूल्यांकन में शीर्ष प्रदर्शन करने वाले वंशक्रमों की पहचान की गई, जिसमें मूंग दाल में MG8 की उपज औसत जांच से तीन गुना अधिक थी।
- 35 शीघ्र पकने वाली, 22 मध्यम अवधि में पकने वाली तथा 6 विलम्बित पकने वाली चावल आर.आई.एल. का मूल्यांकन किया गया, जिसमें शीघ्र पकने वाली किस्मों से 38% तक अधिक उपज प्राप्त हुई।
- फील्ड की परिस्थितियों के तहत जलमग्नता सहिष्णुता के लिए चौसठ पुनः संयोजक अंत:प्रजात वंशक्रमों (आरआईएल) का मूल्यांकन किया गया, जिनमें से 26 ने 100% उत्तरजीविता दरें दिखाई। चार जीनप्ररूप (एमजी8-4-4-ई-18, एमजी8-4-76-एम-40, एमजी4-1-126-एम-9, एमजी4-2-146-एम-40) ने बेहतर सहिष्णुता और अनाज की बेहतर उपज का प्रदर्शन किया।

कृषि विज्ञान केंद्र, दक्षिण अंडमान

- किसानों और कृषि महिलाओं, ग्रामीण युवाओं और विस्तार कार्यकर्ताओं के लिए 11 प्रशिक्षण कार्यक्रम, 25 जागरूकता कार्यक्रम आयोजित किए गए। प्रशिक्षण और जागरूकता कार्यक्रमों से कुल 807 पुरुष और 559 महिलाएं लाभान्वित हुईं।
- लगभग 13,760 सब्जी के पौधे (बैंगन, मिर्च, टमाटर, नारियल और सुपारी) और 1800 लीटर जीवामृत और नीमास्त्र का उत्पादन किया गया और इनकी बिक्री की गई।
- आम, आंवला और कटहल की कटाई के बाद की प्रक्रिया में आम का अचार, आंवले का अचार और कटहल के चिप्स तैयार किए गए। लगभग 400 किलोग्राम आम का अचार और 20 किलोग्राम आंवले का अचार तैयार कर बेचा गया।
- श्रीमती भानुमति को तकनीकी मार्गदर्शन, सहायता और प्रशिक्षण प्रदान किया तथा उन्हें सहजन (मोरिंगा) के खाद्य प्रसंस्करण और मूल्य संवर्धन का लघु उद्यम स्थापित करने के लिए प्रोत्साहित किया।

कृषि विज्ञान केंद्र, कार निकोबार

- अधिक उपज देने वाली फसल किस्मों (सीएआरआई 1, सीएआरआई 1, अर्का प्रभात, अर्का मेगना, अर्का निधि, अर्का निकिता, अर्का रक्षक, अर्का अनामिका, केपीसीएच 1, अर्का श्रेयस) की रोपण सामग्री का उत्पादन और वितरण किया गया।
- इस अवधि के दौरान द्वीप - वर्टिग्रो, पशुधन सह बागवानी आधारित आईएफएस मॉडल पर एक एफएलडी शुरू किया गया, जिसमें पर्यावरण अनुकूल क्यू ल्यूर फेरोमोन जाल, कद्दूवर्गीय फल मक्खियों के प्रबंधन के लिए पीले चिपचिपे जाल और भिंडी किस्म अर्कानिकिता की खेती को बढ़ावा दिया गया।
- मक्का (स्वीट कॉर्न) (जिया मेस) और मूंग (विग्ना रेडिएटा) के आकलन पर बैंगन की किस्मों सीआईएआरआई 1 और 2 तथा ओएफटी की अंतरफसल की खेती का कार्य पूरा कर लिया गया है।
- जैविक भिंडी की खेती और एकीकृत कृषि प्रणालियों जैसी सफलता की कहानियों ने उल्लेखनीय आय सृजन को उजागर किया और कृषक समुदायों को इसे व्यापक रूप से अपनाने के लिए प्रेरित किया।

कृषि विज्ञान केंद्र, उत्तर एवं मध्य अंडमान

- किसानों, कृषि महिलाओं, ग्रामीण युवाओं और विस्तार कार्यकर्ताओं के लिए 15 प्रशिक्षण कार्यक्रम और 10 जागरूकता कार्यक्रम आयोजित किए गए, जिनसे कुल 631 पुरुष और 431 महिलाएं लाभान्वित हुईं।
- तीन प्रौद्योगिकी प्रदर्शन कार्यक्रम आयोजित किए गए, जिनसे 203 किसान और कृषि महिलाएं लाभान्वित हुईं। प्रौद्योगिकी के और अधिक प्रसार को बढ़ावा देने के लिए एक किसान के खेत में आयोजित एक फील्ड दिवस से अतिरिक्त 15 किसान और कृषि महिलाएं लाभान्वित हुईं।
- लगभग 9,495 सब्जी के पौधे (बैंगन, मिर्च, टमाटर), सुपारी,

धान, काली मिर्च की जड़ वाली कटिंग, गेंदा और सजावटी पत्ते तैयार किए गए और बेचे गए। दस लीटर जैविक इनपुट (नीमास्त्र, जीवामृत और अग्निस्त्र) भी तैयार किए गए।

- एनएंडएम अंडमान जिले के पंचवटी क्षेत्र के स्वयं सहायता समूहों (दीप, ड्रीम टीम, ईगल फ्लाई, आशा और अटल) को सीप (ऑयस्टर) मशरूम उत्पादन और मूल्य संवर्धन के लघु-स्तरीय उद्यम स्थापित करने के लिए तकनीकी मार्गदर्शन, सहायता और प्रशिक्षण प्रदान किया गया

Executive Summary

Division of Horticulture and Crop Improvement

- Two improved varieties of Malabar tamarind, Dweep Agrim, and Dweep Vishal, were released through the Institute Variety Release Committee.
- Two inventions namely Closed Water Circulatory System and Cinnamon Bark Rubbing Tool were registered with the Indian Patent Office.
- Established eight collections of Andaman Kokum, five of Korangi banana, twenty-four of cinnamon, and six of tejpat under field conditions.
- Foliar nutrition (19:19:19) on seedlings of Andaman Kokum showed significant improvement in collar thickness.
- Dragon fruit multiplication under island conditions was studied in which the use of IBA supported rooting but was not essential for inducing rooting of cuttings.
- Fat content in the seeds of *Garcinia* spp. was found to be in the order; *G. dhanikhariensis*>*G. gummi-gutta*>*G. kydia*>*G. xanthochymus*>*G. cowa*. Inter-specific grafting trials in *Garcinia* spp. suggested compatibility of *G. dhanikhariensis* as a rootstock for *G. gummi-gutta* and *G. kydia*.
- Evaluation of twenty-four accessions of true cinnamon suggested significant differences in yield and quality parameters. An accession with no peak of coumarin was observed during two years of analysis.
- Accession numbers were obtained for twenty-four collections of cinnamon and six collections of tejpat from ICAR-NBPGR, New Delhi.
- Six selected seedling progenies of clove were evaluated for yield, morphological, and biochemical parameters, which revealed significant differences. Variability was also noticed for Eugenol and other bioactive contents.
- Six collections of *Piper sarmentosum* from different parts of the islands were mass multiplied, and an evaluation block was established. Variability was also noticed in leaf, plant growth, and fruit parameters among the collections.
- For nursery raising of medicinally important *Aranya Jeeraka* (*Centratherum anthelminticum*), the use of GA_3 (500 ppm) as seed treatment and vermicompost as substrate was recommended.
- Two Dwarf coconut varieties (Dweep Haritha and Dweep Sona) released by ICAR-CIARI, Notified in the Official Gazette, Ministry of Agriculture and Farmers Welfare, Government of India.

Division of Natural Resource Management System

- Coconut + goat-based IFS model from 1 ha recorded a net income of Rs.1.82 lakh with coconut equivalent yield of 10900 nuts/ha/yr and employment generation of 190 man-days.
- Organic farming in rice (CIARI Dhan-7) revealed that application of 100 % N through

green manure, green leaf manure & Azolla, and Panchagavya spray recorded a higher grain yield of 3.46 t/ha, which is 16 percent less than the 100 % RDF through inorganic fertilizers (4.12 t/ha).

- Under the natural farming project in rice, both organic farming and organic+natural farming recorded higher yields of 3.65 and 3.42 t/ha, respectively as compared to natural farming (3.17 kg/ha).
- Issued 100 agromet advisories and 33 impact-based forecast advisories at the district level.
- Purple fleshed greater yam variety Sree Neelima recorded a higher yield (22.42 t/ha) followed by the entries TGy 20-2.
- Deposited nineteen accessions of *Colocasia esculenta* to ICAR-NBPGR, New Delhi, and obtained IC numbers (653033 to 653051).
- Distinctness Uniformity and Stability (DUS) analysis was conducted for three Pandanus species (*P. leram*, *P. tectorius* and *P. odorifer*).
- Designed a small tool "Dweep Nicobari Aloo Peeler" for removing skin from the undulated and un-uniformed tubers to reduce the wastage during the peeling activity of the Greater Yam (*Diascorea alata*) commonly called Nicobari Aloo.
- Designed a small tool "Dweep-Pandanus fruit pulp extractor" for extracting fruit pulp from the fibrous fruit keys of Pandanus lerum fruits.
- The phytochemical components of Andaman Padauk (*Pterocarpus dalbergioides*) bark methanol extracts resulted from a total of 131 components out of which 24 classes of phytoconstituents were found to constitute 84.59% area.
- The unique high foliage-producing Pandan accession (*Pandanus amaryllifolius*) was collected from Malacca Village (INGR 24069) of Car Nicobar Islands, and the unique large-sized leaf (*Macaranga nicobarica,* INGR 24083) genotype from Nicobar Islands, India was registered at ICAR.
- A total of 210 samples of fruits and vegetables were collected from various locations across the North, Middle, and South Andaman districts and sent to the Export Inspection Agency (EIA) laboratory, Kolkata for pesticide residue analysis.

Division of Animal Science

- Serum analysis of 189 Andamani goats revealed significantly higher IGF1R levels in the low fecundity group as compared to the high fecundity group. Therefore, IGF1R may be considered as a potent serum biomarker for fecundity in Andamani goats.
- Ration for optimum reproductive efficiency in goats was standardized as the combination of 20% more protein and 20% more energy supplementation improved the scrotal and testicular biometrics, libido, antioxidants, hormones, and semen quality profiles.
- Supplementation of 500 µg *Moringa oleifera* leaf extract/150×10^6 spermatozoa improved the semen quality profile of Teressa goat bucks.
- Comparative reproduction parameters were better in the Teressa goats when compared to Andamani goats in tropical humid island ecosystem.
- A total of 166 samples *viz*. feed, manure,

vegetables, milk, curd, chicken retail shop, fish, and goat meat were collected from different parts of the South Andaman district and screened for isolation of different pathogens. Isolation of *E.coli* (n=40) was found to be highest followed by *K.pneumoniae* (n=37), *Salmonella spp* (n=32), and *Staphylococcus* spp (n=26). The common vegetables contaminated with bacteria were coriander, cauliflower, spinach, and carrot.

- A total of 200 cattle sera samples were screened for the presence of *Brucella abortus* antibodies by the Rose Bengal Plate Test. None of the samples was found positive. Out of 182 goat sera samples screened for the presence of peste des petits ruminants virus antibodies (PPRV), none of the samples was found positive. During the reporting period, three outbreaks of contagious ecthyma (Orf) with an attack rate of 9.4 % and one outbreak of caseous lymphadenitis with an attack rate of 7.4 % in goats were reported.
- The molecular characterization of *Corynebacterium pseudotuberculosis*, the causative organism for Caseous lymphadenitis in goats and sheep, was done based on sequence information of 16S rRNA and RNA polymerase β subunit (rpoB) gene fragments. A total of 13 isolates were confirmed and rpoB-based phylogenetic analysis indicated that the isolates belonged to *Corynebacterium pseudotuberculosis* biovar ovis.
- Under the All India Coordinated Research Project on Goat Improvement, the overall least-square means of body weights (kg) at birth, 3, 6, 9, and 12 months of age were 1.45± 0.17, 6.16± 0.32, 10.03± 0.12, 12.55± 0.11 and 16.37± 0.12 respectively. The net income per animal per year was found to be Rs. 5669.4.
- The polyherbal acaricide was evaluated in goats at the field level and showed 100 % efficacy against *Rhipicephalus microplus* infestation.
- The impact of a CIARI technology "Dweep Humpsore Gau Maa Rakshak" on milk yield and farmer's income was quantified. The mean increase in milk yield was 0.61 liters, which, at an average selling price of ₹71 per liter, generated a net incremental benefit of ₹10,120 per animal per year for farmers using this technology.

Division of Fisheries Science

- Altogether, twenty-one disease cases were reported from fishes due to infectious and non-infectious diseases such as bacterial, parasitic, fungal, and water quality-related issues in Andaman and Nicobar Islands.
- The bioactive compounds were identified and characterized in three seaweed species such as *Gracilaria edulis, Padina tetrastromatica,* and *Halimeda opuntia* which includes polysaccharides, amino acids, alkenes, phosphine, aromatic amines, lignins, phospholipids, carboxylic acids, fatty acids, and minerals.
- A systematic study has been initiated to investigate the dynamics and surveillance of antimicrobial resistance (AMR) in the freshwater aquaculture of the Andaman and Nicobar Islands. To understand the

prevalence of AMR, the study will focus on target organisms such as Escherichia coli, Staphylococcus spp., and Aeromonas spp.

- Established the first Science, Technology, and Innovation (STI) hub at Big Lapathy village, Car Nicobar in collaboration with the Office of Tribal Council. Developed NICMIS mobile application to promote the use of ICT tools among tribal fishers of Car Nicobar.
- Seaweed cultivation trails were successfully undertaken in Chidiyapatu protected Bay during the pre-monsoon period (February to May 2024) for two species *Gracilaria edulis* and *Acanthopora spicifera*.
- *In-vitro* test of the antiparasitic effect of *A. paniculata* aqueous extract against *Argulus japonicus* showed that the application of the test solution at 150, 200, 250, and 300 ppm caused 90 to 100 percent mortality at 120, 150, and 180 minutes.
- A total of 1,560 pond-related data across the Andaman and Nicobar archipelago were imported into the Dweep Geoportal, where a WMS service was developed through the Open Layer interface to facilitate image visualization in the Geo-server.
- A biofloc tank of 4meter diameter and 10000 liters capacity was constructed and shrimp seed of *Penaeus vannamei* PL-10 was stocked @3000 nos in the tank. A total of 15 kg of shrimp was harvested in 90 days of culture.
- *Mugilogobius chulae*, a freshwater goby, and *Esomus danrica*, a cyprinid fish has been recorded for the first time from the Andaman and Nicobar Islands, and their partial co1 gene was characterized.
- The 'Dweep - Carp Grower Feed' technology was certified by ICAR, New Delhi on 16thJuly 2024.
- One fish aggregating device (FAD) was deployed successfully on Minicoy Island, Lakshadweep for the benefit of the tribal fishermen.

Field Crop Improvement & Protection Section

- Forty-four germplasm accessions of field and horticultural crops were collected from three districts of Andaman and Nicobar Islands.
- Ivy gourd (*Coccinia grandis*) field gene bank was established, with over twenty accessions from Andaman and Nicobar Islands. All the accessions were submitted to ICAR-NBPGR for allotment of IC number.
- A total of 226 rice, 59 mung bean, and 44 urd bean germplasm were multiplied and conserved.
- Ten improved onion varieties were evaluated, with Bhima Shubhra performing best in fresh weight and chlorophyll content.
- Six sesame varieties *viz*. Thilathara, Thilak, Thilarani, Kayamkulam-1, TMV-3, and TMV-4 were evaluated which showed significant differences in days to 50% flowering and 1000 seed weight.
- Snap melon evaluations identified PP-13 with the highest salad weight (268.9g), followed by IC647729 (260.8 g).
- Six improved rice lines developed through MAGIC demonstrated high yield, better harvest index, and superior plant architecture.
- MG8-4-77-E-45 was the top-performing early-duration line, yielding 5548.4 kg/ha,

19% higher than the check variety.

- Urd bean and mung bean evaluations identified top-performing lines, with MG8 in mung bean yielding over three times the average of the checks.
- Thirty-five early, twenty-two medium and six late-duration rice RILs were evaluated, with early lines achieving up to 38% higher yields.
- Sixty-four recombinant inbred lines (RILs) were evaluated for submergence tolerance under field conditions, with 26 showing 100% survival rates. Four genotypes (MG8-4-4-E-18, MG8-4-76-M-40, MG4-1-126-M-9, MG4-2-146-M-40) exhibited superior tolerance and grain yield.

Krishi Vigyan Kendra, South Andaman

- Conducted 11 training programs, 25 awareness events for farmers and farm women, rural youth, and extension functionaries. A total of 807 males and 559 females were benefitted from the training and awareness programs.
- Around 13,760 nos of vegetable seedlings (brinjal, chilli, tomatoes, coconut, and arecanut) and 1800 liters of Jeevamrut and Neemastra were produced and sold.
- Post-harvest processing of mango, amla, and Jackfruit was carried out by preparing mango pickle, amla pickle, and jackfruit chips. Around 400 kgs of mango pickle, and 20 kgs of amla pickle were prepared and sold.
- Provided technical guidance, support, and training to Smt Bhanumati and motivated her to establish a small-scale enterprise in food processing and value addition in Moringa.

Krishi Vigyan Kendra, South Andaman

- Planting material of High-yielding crop varieties (CARI 1, CARI 1, Arka Prabhat, Arka Megana, Arka Nidhi, Arka Nikita, Arka Rakshak, Arka Anamika, KPCH 1, Arka shrayas) were produced and distributed.
- A FLD on Dweep-Vertigrow, livestock cum horticulture-based IFS model, promoting eco-friendly cue lure pheromone traps, yellow sticky traps for the management of cucurbit fruit flies, and cultivation of Okra var. ArkaNikitha was undertaken during the period.
- Cultivation of Brinjal varieties CIARI 1 & 2 and OFT on assessment of sweet corn (*Zea mays*) and green gram (*Vigna radiata*) intercropping was completed.
- Success stories like organic okra cultivation and integrated farming systems highlighted remarkable income generation and inspired widespread adoption among farming communities.

Krishi Vigyan Kendra, North & Middle Andaman

- Conducted 15 training programs, and 10 awareness programs for practicing farmers, farm women, rural youth, and extension functionaries in which a total 631 number of males and 431 females were benefitted.
- Three technology demonstration programs were organized, benefiting 203 farmers and farm women. A field day at a farmer's field to promote the further spread of the technology benefited an additional 15 farmers and farm women.

- Around 9,495 vegetable seedlings (brinjal, chilli, tomatoes), arecanut, paddy, black pepper rooted cuttings, marigolds, and ornamental foliage were produced and sold. Ten liters of bio-inputs (Neemastra, Jeevamrit, and Agniastra) were also produced.
- Provided technical guidance, support, and training to SHGs (Deep, Dream Team, Eagle Fly, Asha, and Atal) of Panchwati region of N&M Andaman district for establishing a small-scale enterprise in oyster mushroom production and value addition

Introduction

ICAR -Central Island Agricultural Research Institute (CIARI)

ICAR-Central Island Agricultural Research Institute (CIARI) formerly Central Agricultural Research Institute (CARI) was established on 23rd June 1978 by merging different Regional Research Stations of the ICAR Institutes at Port Blair *viz*., Central Marine Fisheries Research Institute, Indian Veterinary Research Institute, Indian Agricultural Research Institute, and Central Plantation Crops Research Institute. During October 1989, the Regional station of CPCRI located at Minicoy, Lakshadweep Islands was merged to this Institute to serve as a Regional Station of CARI. This Lakshadweep centre was later transferred to CPCRI in late 1994 and then again brought back under CIARI from April 2017 as Regional Station. ICAR- CIARI is conducting research work for the farming community of these Islands. The Institute has four research divisions *viz*., Horticulture and Crop Improvement, Animal Science, Fisheries Science and Natural Resource Management. The main research-cum-residential complex located at Garacharma, 9 Km away from Port Blair houses the Director's Office, Administrative Block and a Central Laboratory Building besides research farm. The Institute has four research farms. (i) Garacharma farm of 62 ha. area, where works on field crops, horticulture, animal sciences and fresh water fisheries are carried out. (ii) Sippighat farm having an area of 32 ha. where research work on horticulture is carried out. (iii) Bloomsdale Farm which has flat lands of 3.5 ha. and this is used for research works of natural resource management and field crops divisions. (iv) Marine Hill Research Laboratory has a sea front hatchery facility and a fisheries informatics lab. The Institute has three KVKs, one at Port Blair established in 1993, another at Nicobar established in 2010 and at Nimbudera established in 2012. The Institute also has various Central facilities for smooth functioning of the Institute *viz*. (i) Central Instrumentation Facility (ii) Priority Setting, Monitoring & Evaluation Cell (iii) Hindi Cell, (iv) AKMU (v) Library (vi) ITMU (vii) PG Cell (viii) ATIC.

Mission

To provide decent livelihood to farm youth from agriculture in a fragile Island ecosystem on sustainable basis.

Vision

The Institute envisages developing agri horticulture, livestock and fisheries sector in a sustainable way through technological innovation in the changing climatic scenario to ensure decent livelihood in the fragile Island ecosystem.

Mandate

- To provide a research base to improve the productivity of agri-horticulture, livestock and fisheries of Andaman & Nicobar and Lakshadweep group of Islands through basic, applied and adaptive research
- Conservation, characterization and sustainable utilization of natural resources and harnessing through post harvest and value addition.

- To standardize technologies for health coverage and bio security of plant, animal and fishery resources.
- To standardize techniques for capture and culture fisheries including coastal aquaculture
- Vulnerability studies of Island ecosystem and adaptive strategies to develop climate resilient agriculture.
- Transfer of technology, capacity building, policy support and market intelligence to stake holders

Thrust Areas

Broad research programmes are as under:

- Broad research programmes are as under: → Conservation and utilization of Island biodiversity.
- Enhancing the productivity of agriculture, livestock, and fisheries sector → Management of biotic and abiotic stress.
- Frontier research for knowledge and increased productivity.
- Post-harvest technology and value addition.
- Water resource development and utilization

Organisational Set Up

Administration of the institute rests with the Director, who receives support from both research divisions and administration. The Research Advisory Committee (RAC), Institute Management Committee (IMC) and Institute Research Council (IRC) reviews and monitor the research programmes and facilitates to identify new research thrust areas for the Institute.

Staff Position

Sl. No.	Category	Sanctioned	Filled
1	Scientist	44+1	27+1
2	Technical	44	28
3	Administrative	27	20
4	Supporting	66	45
Total		**182**	**124+1**

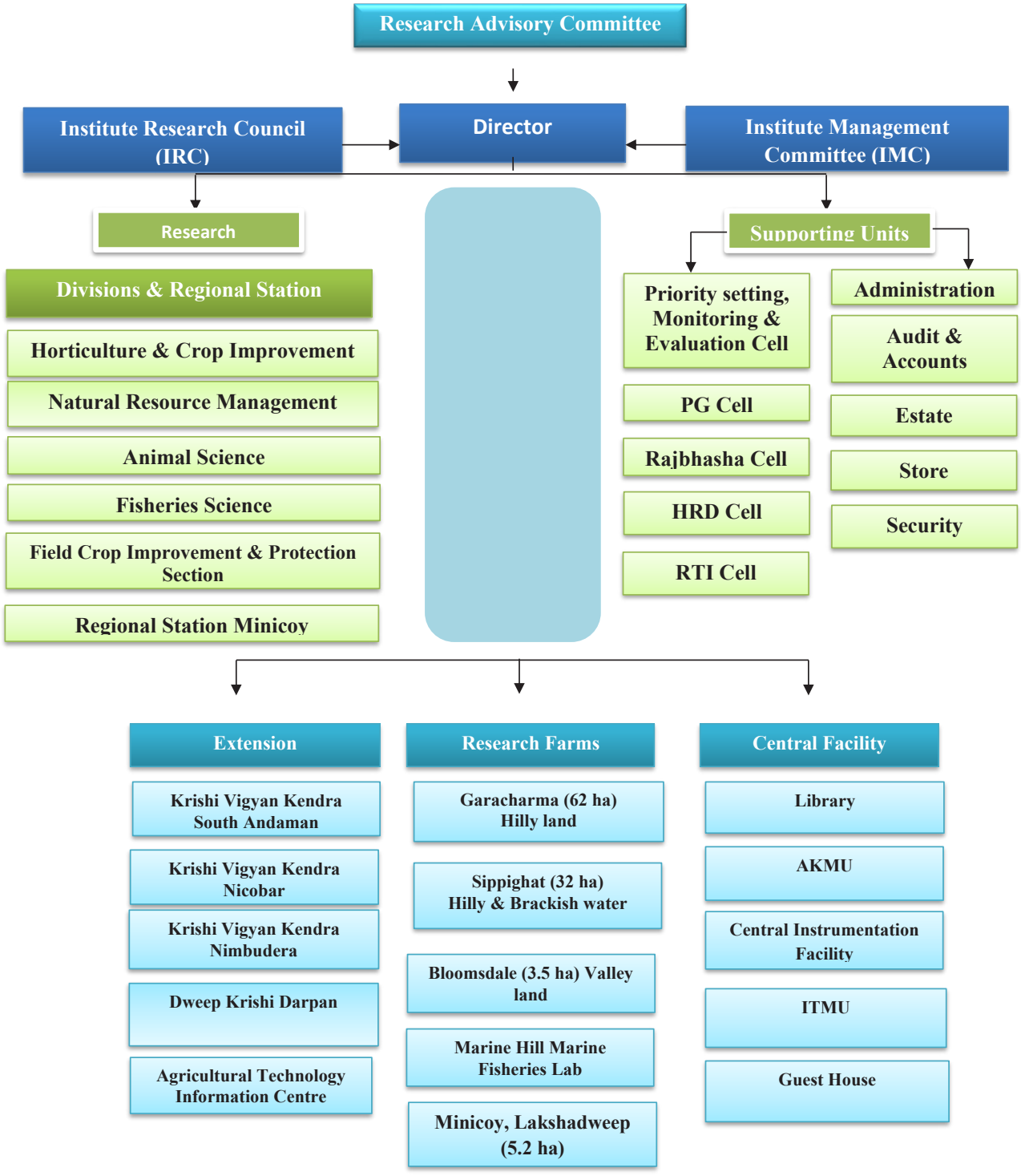
Budget utilization during 2023-2024

Head	Sanction (in lakhs)	Expenditure
Grant-in aid Capital	117.50	116.34
Grant in aid – Salary	1938.70	1871.79
Grant in aid – General	590.00	588.26
% utilization		97.36

Revenue (Rs in Lakhs)

Target	Achieved
62.27	71.73

Organogram


Research Advisory Committee
Institute Research Council (IRC)
Director
Institute Management Committee (IMC)
Research
Divisions & Regional Station
Horticulture & Crop Improvement
Natural Resource Management
Animal Science
Fisheries Science
Field Crop Improvement & Protection Section
Regional Station Minicoy
Supporting Units
Priority setting, Monitoring & Evaluation Cell
PG Cell
Rajbhasha Cell
HRD Cell
RTI Cell
Administration
Audit & Accounts
Estate
Store
Security
Extension
Krishi Vigyan Kendra South Andaman
Krishi Vigyan Kendra Nicobar
Krishi Vigyan Kendra Nimbudera
Dweep Krishi Darpan
Agricultural Technology Information Centre
Research Farms
Garacharma (62 ha) Hilly land
Sippighat (32 ha) Hilly & Brackish water
Bloomsdale (3.5 ha) Valley land
Marine Hill Marine Fisheries Lab
Minicoy, Lakshadweep (5.2 ha)
Central Facility
Library
AKMU
Central Instrumentation Facility
ITMU
Guest House

Research Achievements

Division of Horticulture and Crop Improvement




Division of Horticulture and Crop Improvement

Collection and Conservation Efforts in Plant Genetic Resources

Conservation block of woody pepper

Piper pendulispicum, which was recently reported to be a new species for the country, was planted in the natural ventilated shade net house for facilitating its conservation. The structure was provided with UV stabilized sheet and drainage to avoid water stagnation inside the structure. The facility of drip irrigation has been made to facilitate provision of water in appropriate quantities and avoid damage due to foot rot pathogen. After four months of planting, mean plant height was 102.59 cm, mean collar thickness was 9.03 mm, mean no. of nodes of 45.94, two primary branches, mean leaf length of 15.26 cm and mean width of 9.91 cm.

Plate 1. Woody pepper

Conservation and Evaluation of Andaman Kokum collections

Eight collections of endemic Andaman Kokum were planted in the Field Gene Bank for their detailed evaluation. Growth parameters were recorded after 8 and 14 months of planting and the data has been presented in the Fig 1 Plant height varied between 35.6 cm and 93.3 cm at 8 MAP, while it ranged between 47.5 cm and 139.8 cm at 14 MAP among the collections. Collar thickness varied from 3.6 mm to 11.2 mm at 8 MAP of age, while the range was 6.2 to 18.9 mm at 14 MAP. Canopy spread also increased with time in all the collections. In general, plants of the collection GDH/SA/SAM showed vigour for growth parameters, while plants of GDH/SA/SUB were least vigorous during this period.

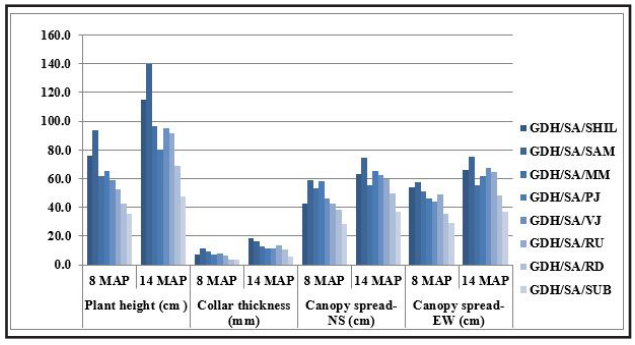


Fig 1. Growth parameters in the collections of endemic *Garcinia dhanikhariensis* at 8 and 14 MAP

Collection and establishment of Korangi banana

Korangi is a potential banana cultivar that is grown in few pockets of the North and Middle Andaman Islands. It has good edible

Plate 2. Korangi banana

quality, dark yellow pulp and ability to grow in high rainfall including high water table areas. Five collections of it were collected from North Andaman, Middle Andaman and South Andaman Islands and established in the experimental field at Garacharma.

Collection of *Glycosmis pentaphylla*

An underutilized fruit species *viz*. *Glycosmis pentaphylla* was collected from South Andaman Island and morphological parameters were recorded in ripe fruits. Fruits were 8.66 ± 0.084 mm long, 11.80 ± 0.143 mm wide and weighed 0.98 ± 0.026 g each. Seeds in this fruit were 6.75 ± 0.075 mm long, 9.07 ± 0.141 mm wide and 0.35 ± 0.013 mm thick. Seedlings have been raised from the collection and planted in the field for further evaluation.

Characterization, Evaluation and Utilization of Plant Genetic Resources

Release of Improved Varieties of Malabar Tamarind

Through perennial evaluation under Andaman Island conditions, Malabar tamarind (*Garcinia gummi-gutta*) has been identified as a potential crop for cultivation. In order to identify suitable varieties, the existing seedling progenies conserved in the Institute were systematically evaluated. Two improved varieties, *viz*. DweepAgrim and Dweep Vishal, have been released through the Institute Variety Release Committee. Variety Dweep Agrim exhibits early harvesting season with average yield of 115.1 kg/ tree/ year. The fruits have thin rind of 5.6 mm, thereby facilitating easier manual processing. The variety Dweep Vishal is a high yielding one with mean yield of 171.1 kg/ tree/ year. It bears large sized fruits of 152.4 g with thick rind (11.8 mm).

Dweep Agrim

Dweep Vishal

Plate 3. Improved Varieties of Malabar Tamarind

Evaluation of cinnamon accessions

Twenty-four seedling progenies of true cinnamon were evaluated for various yield and quality characteristics to identify germplasm having potentially desirable traits. Significant variations were noticed among the studied accessions for yield parameters such as fresh and dry bark yield, dry recovery (30.1 to 45.6 %), fresh bark thickness (0.83 to 2.05 mm) and dry bark thickness (0.39 to 1.39 mm). Further, quality parameters such as bark essential oil content (0.28 to 1.82%) and bark oleoresin content (6.01 to 14.49 %) showed significant variations among the collections studied, apart from the GC-MS profile of the essential oil. Interestingly, no peak of coumarin was detected in one collection during two years of analysis, while coumarinconcentration of up to

398.2 mg/kg was observed in other accessions. Leaf morphological parameters also showed significant variations among the accessions. The collections showed ease of peeling scores of 1.0 (easy) to 2.0 (medium) during this period. Based on the perennial evaluation, few elite accessions with desirable traits have been shortlisted. A field block was established at the Garacharma farm by multiplying the collections through air layering and national identity (Indigenous Collection numbers) were obtained for all the collections from the ICAR-NBPGR, New Delhi (IC653472 to IC653495).

Evaluation of tejpat accessions

The identified six collections of tejpatwere multiplied though air layering and an experimental block was established as an intercrop in the arecanut garden at the Garacharma farm. National identities (Indigenous Collection numbers) were obtained for all these collections from the ICAR-NBPGR, New Delhi (IC653496 to IC653501). Growth observations were recorded and the data has been presented in Table 1 Plant height varied between 103.6 and 131.7 cm, while the collar thickness ranged between 19.4 to 25.9 mm. The plants had average of 13.2 to 16.7 primary branches. Further, variability on yield contributing parameters was studied in the mother plants, which suggested that number of branches per meter of the primary branch varied between 15.7 (IC653497) and 29.3 (IC653496), while number of leaves per meter of branch varied between 681.3 (IC653496) and 1427.7 (IC653500).

Table 1. Growth parameters of tejpat accessions after 16 MAP

Accession	Plant height (cm)	Collar thickness (mm)	No. of primary branches	Canopy Spread (cm)	
				N-S	E-W
IC653496	129.8 ± 21.35	25.1 ± 4.09	15.0 ± 3.72	103.2 ± 17.44	104.3 ± 10.19
IC653497	109.9 ± 20.68	23.2 ± 2.47	13.2 ± 2.04	103.5 ± 10.26	98.5 ± 12.09
IC653498	129.8 ± 18.61	23.9 ± 4.22	15.2 ± 1.97	100.6 ± 13.51	102.1 ± 12.62
IC653499	131.7 ± 21.10	25.9 ± 4.25	16.7 ± 2.97	102.1 ± 17.08	98.7 ± 16.14
IC653500	103.6 ± 17.20	19.4 ± 3.41	13.8 ± 3.09	87.1 ± 10.61	77.4 ± 7.51
IC653501	116.6 ± 9.41	22.1 ± 1.83	14.3 ± 2.19	98.4 ± 9.68	90.4 ± 10.44

Evaluation of clove collections

Clove is a popular spice crop being grown in some parts of the islands, especially as an intercrop. In order to identify superior germplasm of clove for island conditions, six selected seedling progenies were studied in detail for various morphological and biochemical parameters. Results revealed significant variability for various morphological parameters including leaf length (10.75 to 12.09 cm), petiole length (1.80 to 2.02 cm), leaf weight (0.53 to 0.68 g), fresh bud length (15.47 to 17.77 mm), dry bud length (12.78 to 15.05 mm), fresh bud weight (0.25 to 0.32 g), dry bud weight (0.08 to 0.12 g), number of buds per cluster (5.96 to 11.24), cluster weight (2.27 to 4.20 g), cluster

length (52.10 to 60.13 mm) and cluster spread (36.44 to 48.58 mm).

Cumulative yield data was recorded for five years period and the mean fresh bud yield varied from 3.16 kg (Sa/C-5) to 4.50 (Sa/C-1). Dry yield of bud, which is the produce of commerce, was found to be the highest (1.58 kg) in Sa/C-1, and remained statistically on par with Sa/C2 (1.45 kg), Sa/C-4 (1.44 kg) and Sa/C6 (1.35 kg). Mean drying recovery of 30.80 to 35.38% was observed among the collections. Essential oil content in bud varied between 10.55 and 13.65%, while that in clove pedicel was 2.00 to 3.60%. Variability was also noticed for Eugenol and other bioactive contents.

Evaluation of collections of *Piper sarmentosum*

Six collections of *Piper sarmentosum* collected from different parts of the islands were mass multiplied and an evaluation block was established with *P. longum* var. Viswam as the check. The collections showed good establishment under field condition and minor incidence of mealy bugs was observed in the collections including in the check. Leaf parameters for check were recorded as 6.58 cm leaf length, 5.75 cm as leaf width, 3.47 cm of petiole length, 1.61 mm of petiole thickness and individual leaf weight of 0.62 g. The parameters varied among collections of *P. sarmentosum* and significantly longer (7.98 to 9.16 cm) and wider (6.31 to 7.59 cm) leaves were noticed among the collections than the check. All the collections showed significantly longer petioles (1.91 to 2.22 cm) and had heavier leaves (0.78 to 0.99 g) than the check. Variability was also noticed in plant growth parameters among the collections. Among fruit characters, fruit length didn't differ among the collections of *P. sarmentosum* (25.37 to 27.23 mm) and check (27.22 mm). For fruit width, pedicel length, fruit weight and dry recovery (%), some collections of *P. sarmentosum* statistically outperformed the check, thereby suggesting the potential of this species.

Plate 4. Collections of *Piper sarmentosum*

Crop Production and Postharvest Management

Effect of foliar nutrition on seedlings of Andaman Kokum

Andaman kokum has been identified as a species with commercial potential in the islands. In order to popularize the species, development of suitable agro-techniques is necessary. Previous studies in the species at the institute suggested that the species takes about 18 to 24 months for getting seedlings of graftable thickness. In order to hasten the process of collar thickening, an experiment was carried out in which effect of six foliar nutrition treatments (19:19:19::N:P:K) was studied. Paired t-test analysis revealed significant improvement in collar thickness over the initial values and the long-term effect is being studied.

Pot culture experiment in papaya

Papaya is a popular crop in the islands including the tribal masses. As cultivable land is a limiting factor in the islands, establishment of large monocrop orchards is rarely feasible. To explore the possibility of papaya cultivation under potted conditions, an experiment was initiated. Seedlings of gynodioecious hybrid ArkaPrabhat were planted in plastic barrels and plants were grown under green shade net (50%), naturally ventilated polyhouse and open condition. Data recorded after seven months suggested that plant height was the highest in shade net conditions (261 cm), while plants remained the shortest (188 cm) under polyhouse conditions. Flowering and fruit set was noticed in open and shade net conditions, while plants remained in juvenile stage in the polyhouse condition.

Dragon fruit multiplication

Dragon fruit is an introduced fruit species in the islands and even though the islands are characterized by warm and humid climate, it flowers and fruits here. In order to study its propagation in these conditions, a study was conducted in which effect of IBA (500 ppm) was compared with untreated control. Results suggested that use of auxin improved sprouting percentage in the cuttings; however, absence of sprouting did not relate to the survivability of the cuttings as the final survival remained statistically on par in both the treatments. Number of roots was significantly improved from 3.20 to 5.67 per cutting with the use of auxin. This reduced the thickness of longest root without affecting the length of longest root in the cutting. Number of sprouts and their thickness did not get affected by the inclusion or exclusion of auxin.

Plate 5. Dragon fruit multiplication

Nursery studies in Medicinal Wild Cumin

Aranya Jeeraka (*Centratherum anthelminticum*) is an important medicinal plant valued in the Indian System of Medicine. Though there is regular demand for the raw material of this species, it is largely sourced from the wild and systematic cultivation is lacking. In order to promote its cultivation, development of agro-techniques is crucial. Series of experiments were conducted to develop nursery protocol for the species. Effect of twelve treatments including water soaking, potassium nitrate (0.1 and 0.2%), gibberellic acid (GA_3, 100, 250, 500 ppm), NAA (100, 250, 500 ppm) and IAA (100, 250, 500 ppm) was compared with untreated control. Results suggested significantly superior seed germination (46.33%) in seeds treated withGA_3 (500 ppm), when compared to untreated control (32.33%). Experiment was also conducted to study the effect of four substrates on seed germination, results of which suggested superiority of vermicompost in improving the seed germination (%), germination characteristics and seedling vigour.

Seed fats from *Garcinia* species

Garcinia species are known to be sources of fatty acids that have applications in edible and non-edible products based industries. In order to understand the variability of seed fat content in the intra-specific and inter-specific collections of *Garcinia*, an experiment was conducted. Fat content in the seeds was found to be in the order *G. dhanikhariensis* (41%) >*G. gummi-gutta* (38%) >*G. kydia* (29%) >*G. xanthochymus* (23%) >*G. cowa* (18%). Further, intra-specific variations were observed in the collections of *G. dhanikhariensis* and *G. gummi-gutta.* Fat content also showed variation when determined in four fruit developmental stages in *G. xanthochymus*.

Inter-specific grafting in *Garcinia* species

Inter-specific grafting trials were conducted in the genus *Garcinia*. *Garcinia gummi-gutta* and *G. kydia* as scion materials were tried on *G. dhanikhariensis, G. indica* and *G. gummi-gutta* rootstocks. Results revealed that in case of *G. gummi-gutta*, the highest graft success was achieved, when it was grafted on its own rootstock. It was closely followed by *G. dhanikhariensis* as a rootstock. In case of *G. kydia*, *G. dhanikhariensis* was the most successful rootstock closely followed by *G. gummi-gutta*. This suggests potential of endemic *G. dhanikhariensis* as a potential rootstock for mass multiplication of these species. The least success in both the experiments was recorded when *G. indica* was used as a rootstock. For studying the influence of rootstock species on growth of scion species, selected grafts from both the experiments have been planted in pots of 50 L capacity and are being observed at regular intervals.

Initiatives in agro-eco tourism

During the period, a medicinal plants garden comprising of about one hundred species of herbs, shrubs, trees and climbers was established at the Garacharma farm of the Institute. Further, to showcase the visitors about effects of different light spectra on plant growth, four colour shadenet houses were constructed and made functional by planting various species. A field distillation unit was also established with funds from the Directorate of Arecanut and Spices Development, Kerala for demonstrating large scale extraction of essential oils from the spices and aromatic plants of the islands. At Sippighat farm, various initiatives such as creation of selfie points, access roads, display of information boards, aquatic ponds, renovation of nursery areas, creation of blocks of different horticultural species etc. were taken up.

Division of Natural Resource Management




Division of Natural Resource Management

Farming System Research for Islands Ecosystem

Coconut + Goat-Based Integrated Farming System for Hilly Uplands

An Integrated Farming System (IFS) model combining coconut and goats was evaluated in a one hector hilly upland area to enhance farm income. The soil, sandy clay loam with an acidic pH of 5.3, showed medium organic carbon (0.8%), and low phosphorus (3.5-4.5 kg ha^{-1}) and potassium (150-174 kg ha^{-1}) content. The coconut garden's light intensity ranged from 42,300 to 71,045 lux. The coconut plantation was diversified with spices (clove, nutmeg, black pepper), tubers (tapioca, sweet potato), pineapple, and green fodder over 0.9 ha. Fruit trees (banana, breadfruit, lemon) were planted along boundaries, while fodder trees (Subabul, Jackfruit, Albizia Lebbek, etc.) supported the livestock. The system integrated 20 Andaman local goats and 40 Nicobari poultry birds (2 cycles/year). Crop residues and animal waste were recycled through vermicomposting (4.5 t) and nutrient enrichment. Rainwater harvesting was facilitated by a 230 m^3 pond. The system generated a net income of Rs. 1.82 lakh, with a coconut equivalent yield of 10,900 nuts/ha/year and employment of 190 man-days. It produced 179 GJ of energy, with an energy efficiency of 4.80 and a reduction in greenhouse gas emissions of (-) 5855 kg CO2 e yr-1 ha^{-1}.

Sustaining Productivity through Organic Farming in Coconut and Rice-Vegetable Systems

The study on organic farming in coconut-based cropping systems continued in 2024, focusing on sustaining productivity through organic practices. The recommended nutrient dose (500 g N, 320 g P_2O5, and 1200 g K_2O per palm) was applied using combinations of organic sources such as FYM, vermicompost, and green manure. After four years, the application of FYM, waste recycling through vermicomposting, and green manure yielded slightly higher coconut production (77 nuts/tree/year). The organic approach also improved the quality of intercrops like cinnamon, clove, ginger, turmeric, and elephant foot yam, showing better phenols, flavonoids, DPPH, carbohydrates, and protein compared to local market produce.

In the rice-vegetable cropping system, a split plot design was used, with Okra and Brinjal grown under different organic treatments. The highest yield was obtained from

Plate 6. Organic Farming in Coconut and Rice-Vegetable Systems

inorganic fertilizers, while organic treatments, such as vermicompost with bio granules and *Panchagavya* spray, showed relatively lower yields. A confirmatory trial on rice in 2024 demonstrated that organic practices, including green manure and *Panchagavya* spray, resulted in a 16% reduction in yield compared to conventional farming, though it performed better than farmers' practices.

Natural Farming: A Holistic and Economical Farming System Approach for Islands Agriculture

Natural farming has become an effective solution for small-scale farmers, promoting sustainable livelihoods and prioritizing family health. By eliminating external inputs and utilizing local resources, it reduces farming costs and enhances profitability. This approach also restores soil health and builds climate resilience through diverse cropping systems. In the Andaman and Nicobar Islands, a unique agricultural ecosystem faces challenges like frequent natural calamities, limited cultivable land, and dependence on mainland supplies. Developing a natural farming model for coconut and rice-vegetable-based cropping systems could transform island agriculture. Field experiments were conducted to assess the impact of natural farming on plant growth, yield, and soil health in these systems. Results showed that organic farming and organic+natural farming treatments produced higher rice yields (3.65 and 3.42 t/ha) compared to natural farming (3.17 t/ha). In coconut-based systems, crops are still in the vegetative stage, with promising results to follow.

Germplasm Exploration, Conservation and Utilization of Agroforestry

Growth Nutritional Properties and Utilization of Pandanus Species

A two-year growth observation of various Pandanus species was conducted, revealing the height of *Pandanus leram* ranging from 115 to 135 cm, *Pandanus tectorius* from 140 to 250 cm, and *Pandanus odorifer* from 110 to 132 cm. The Distinctness, Uniformity, and Stability (DUS) analysis for these species documented 15 tree and leaf traits, alongside characteristics of flowers, roots, fruits, and seeds.

Nutritional analysis of *Pandanus tectorius*, collected from three different locations in the Andaman and Nicobar Islands, showed that the fruit pulp contained high levels of carbohydrates (20.07%), ascorbic acid (4.08%), phenols (2.67%), flavonoids (0.36%), tannins (5.36%), and oxalates (0.57%). It also exhibited excellent Total Soluble Solids (TSS) content and high antioxidant activity, including hydroxyl radical scavenging (88.5%) and superoxide anion radical scavenging (78.11%). The seeds were rich in protein (12.83%) and saponins (6.27%) with remarkable DPPH activity

Plate 7. Growth of Pandanus species and DUS analysis of 15 traits

(97.53%). Additionally, a new tool, the "*Dweep-Pandanus fruit pulp extractor*," was designed for efficient extraction of pulp from Pandanus fruits. Furthermore, eco-friendly seedling cups made from coconut and Pandanus leaflets were introduced, promoting sustainable farming practices among local farmers.

IET on purple flesh greater yam

Eight entries of purple fleshed greater yam along with one national check and a local check were evaluated for tuber yield, tuber shape and tuber flesh colour. The result revealed that, the variety SreeNeelima recorded higher yield (22.42 t/ha) followed by the entries TGy 20-2. With regard to flesh colour two entries *viz*.,TGy 20-4 and TGy 20-5 are recorded white flesh.

Plate 8. Evaluation of purple-fleshed greater yam for yield and flesh color

Table 2 Performance of IECT on Purple flesh greater yam

Entries	Total yield (tha^{-1})	Tuber shape	Skin colour	Tuber flesh colour
TGy 20-1	17.22	Cylindrical	Purple	White with purple tinge
TGy 20-2	21.07	Cylindrical and branched	Deep purple	Purple
TGy 20-3	13.66	Round	Purple	White with purple tinge
TGy 20-4	18.28	Cylindrical and long	Purple	White
TGy 20-5	10.40	Oval/oblong	Purple	White
TGy 20-6	11.97	Round	Deep purple	Light purple
TGy 20-7	12.40	Round	Deep purple	Purple
TGy 20-8	11.72	Round	Purple	White with purple tinge
SreeNeelima	22.42	Cylindrical	Purple	Light purple
Local	13.44	Cylindrical and branched	Deep purple	Purple
SEm (±)	0.612	-	-	-
CD (0.05)	1.301	-	-	-
CV (%)	4.969	-	-	-

Sequential Cropping System under Padauk Plantation

Under *Pterocarpus dalbergioides* based sequential cropping system okra, brinjal, sword bean, vegetable cowpea, sweet corn, cucumber, tapioca, sweet potato, elephant foot yam, palak, radish, papaya, banana, chilli, Burma dhaniya, pine apple, bitter gourd, pumpkin and *Pandanus amaryllifolius* were grown in different months. Among the crops evaluated some of the crops are in vegetative stage and some crops were harvested and the result revealed that brinjal recorded highest yield of 1.32 kg/plant followed

by okra 0.81kg/plant. Harvested three bunches of banana with the recorded yield of 5.75 kg/ bunch. Under the system harvested 38 kg of Tapioca tubers, veg. cowpea crop with the yield of 2.6 kg in an area of 10 m^2 of each. The cultivation of the crop under the tree influenced positively resulted the better height growth of 4.2 m and 6.4 cm DBH in *P. dalbergioides*.

Growth and Yield Enhancement of *Pandanus amaryllifolius* in Intercrop Systems

The growth, yield, and chemical composition of *P. amaryllifolius* were evaluated from three geographical locations in the Andaman and Nicobar Islands under an Andaman Padauk (*P. dalbergioides*) plantation system. Results showed that intercropping with Andaman Padauk significantly enhanced the plant's growth parameters, including plant height (65.11 cm vs. 54.67 cm in monocrop), number of leaves (63 vs. 58), and leaf length (80.53 cm vs. 65.67 cm). Among the accessions, IC-0646223 (Accession 3) showed superior performance with the highest growth parameters. Yield, including fresh leaf weight, was also higher in the intercrop system (404.86 g/plant vs. 374.89 g/ plant in monocrop). Chemical analysis revealed higher total chlorophyll content, water content (79.44% vs. 74.56%), and fiber content in the intercrop system. Additionally, micronutrients like zinc, manganese, magnesium, and iron were enhanced. GC-MS analysis identified 30 bioactive compounds in each accession, further confirming the intercrop system's benefits.

Accreditation Protocol for Agroforestry Nurseries in Andaman and Nicobar Islands

Production and access to quality planting material (QPM) are vital criteria for ensuring the success of plantations as well as for upscaling agroforestry. The diversity of tree species has been a challenging task in formulating guidelines for QPM production. The CAFRI has so brought out a technical document – Guidelines for Quality Planting Material of Agroforestry Species that has charted out the direction for achieving QPM in tree species. To enable this, the ICAR-CAFRI has brought out this accreditation protocol for agroforestry nurseries. This protocol is based on the fundamental aspects of any nursery which remains the same irrespective of size, nature and choice of propagation material used. Around ten species which are having the potential agroforestry trees viz., Andaman Padauk (*Pterocarpus dalbergioides*), Noni (*Morinda citrifolia*), Bakri pathi (*Bridelia tomentosa*), Chatai Bamboo (*Gigantochloa andamanica*), Motta Beth (*Calamus andamanicus*), Pyinma (*Lagerstroemia hypoleuca*), Bread fruit (*Artocarpus altillis*), Rudraksh (*Elaeocarpus tuberculatus*), Mitha Baji (*Champereia manillana*), Screw Pine(*Pandanus leram)* were developed and documented the accreditation protocol for agroforestry tree seedlings for Andaman and Nicobar.

Tuber Crops Collection and Conservation

Germplasm exploration in Car Nicobar Island led to the collection of 11 unique tuber crop accessions, vital for food security in marginal environments. Additionally, 12

sweet potato varieties from ICAR-CTCRI, Thiruvananthapuram, were conserved at ICAR-CIARI, Port Blair. Innovations included the development of the "*Dweep Nicobari Aloo Peeler*" to minimize wastage during peeling of Greater Yam (*Dioscorea alata*) and finalization of the Dweep Pelletizer for Dioscorea stach balls. Furthermore, 19 *Colocasia esculenta* accessions were deposited to ICAR-NBPGR, New Delhi, with IC numbers 653033 to 653051.

Accession No	Alternative Identity	Village	Important Triats
IC653033	AJDS01 AB1	Tamaloo	Pink colored petiole basal ring, pointed leaf tip, Y type leaf vine pattern, high cormel number
IC653034	AJDS02 LPBT1	Lal Phar (Chouldari)	Round petiole tip, blackish purple petiole colour, slightly round leaf tip
IC653035	AJDS03 HB 1	Harmindar Bay	Cup shaped leaf, light green leaf petiole, High cormel number
IC653036	AJDS04 HB 2	Harmindar Bay	Erect plant type, light green petiole ,undulate leaf blade margin
IC653037	AJDS05 HB 3	Harmindar Bay	Cup shaped leaf, light green leaf petiole, pointed leaf tip, purple petiole junction colour
IC653038	AJDS06 HB 4	Harmindar Bay	Spreading plant type ,large leaves, light green petiole, dark green leaves with purple leaf main veins
IC653039	AJDS07 DT 2	Diglipur	Spreading plant type, cup shaped leaf position, light green petiole
IC653040	AJDS08 DT 3	Diglipur	Erect plant type, cup shaped leaves, light green leaf, pointed tip
IC653041	AJDS09 DT 4	Diglipur	Erect plant type, erect apex down leaf position, green leaf blade colour
IC653042	AJDS10 BL 1	Big Lapathy	Spreading plants, large tubers, good cooking quality
IC653043	AJDS11 HL 1	Havelock	Spreading plant type, leaf erect apex down arrangement, good cooking quality
IC653044	AJDS12 Diglipur-B-1	Diglipur	V type leaf vein pattern, light green petiole, dark green leaves, spreading plant type
IC653045	AJDS13 Diglipur Round	Diglipur	Round tubers, Y type vein pattern, intermediate leaf tip, purple petiole junction colour

Accession No	Alternative Identity	Village	Important Triats
IC653046	AJDS14 Rangat local)	Rangat	Erect plant type, position of leaf- erect apex down, large leaves, purple petiole colour
IC653047	AJDS15 RKP T1	RK Pur	Erect plant type, cup shaped leaves, light green leaf petiole, pointed tip, Yellowish leaf main vein, High number of cormels,
IC653048	AJDS16 RKP C1	RK Pur	Erect plant type, cup shaped leaves, light green leaf petiole, slightly round tip, Greenleaf main vein, High number of cormels
IC653049	AJDS17 L1T1	Long Island	Pinkish petiole basal ring, light green petiole, good cooking quality tubers
IC653050	AJDS18 C 20/23	Port Blair	Very high number of cormels per plant(19),erect plant type, erect apex down position of leaves, greenish purple petiole colour, pointed leaf tip
IC653051	AJDS19 T1 Tapoinming	Tapoinming	Large tuber size, large sized leaves, green colored leaves, petiole and veins, high cormel number (17)

Phytochemical extraction and Plant Protection measures

Phytochemical Profiling of Andaman Padauk Bark Extract

The phytochemical components of Andaman Padauk (*Pterocarpus dalbergioides*) bark methanol extracts were subjected to gas chromatography-mass spectrometry (GC-MS). The obtained spectra were analysed. A total of 131 components were found out of which 24 classes of phytoconstituents were found to constitute 84.59 area percentage. These compounds have been tabulated along with area percentage, retention time, name of compound, molecular weight and molecular formula. The results show highest probability found in components such as 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl- (3.11 %), 2-Methoxy-4-vinylphenol (3.58 %), GUANOSINE (13.76 %), MOME INOSITOL (26.68 %).Thus the methanol Bark extract shows that the major probability of phytochemical which possesses Antioxidant, Anti-inflammatory, Antimicrobial antitumor activities, analgesic, anti-germination, Intracellular signaling pathways, Neuroprotective properties, Anti-alopecic, anti-cirrhotic, anti-neuropathic and cholesterolytic, lipotropic and is mostly preferred for various therapeutic purposes.

Phytochemical Profiling of Noni Wood Extracts

The methanol extracts of Noni wood extracts were subjected to gas chromatography-mass spectrometry (GC-MS). The obtained spectra were analyzed. The methanol extract of wood from noni plant showed many phytocomponents. A total of 18 classes of phytoconstituents were found. The compound's name, molecular weight, formula and structure were extracted from NIST and PUB med. Out

of which two compounds namely 2-Nitrohept-2-en-1-ol and á-n-Propylether of 11-epi-dihydroartemisinin have been detected foe the first time. The highest probability found in components such as (86.5%) 4H-Pyran-4-one,2,3-dihydro-3, 05-dihydroxy-6-methyl-, (69.7%) 4-((1E)-3-Hydroxy-1-propenyl)-2-methoxyphenol, (48.8%) trans-Sinapyl alcohol, (39.1%) 2H-Pyran, tetrahydro-2-(12-pentadecynyloxy)- and (36.1%) n-Hexadecanoic acid. Thus the methanol wood extract shows that the major probability phytochemical possesses Antioxidant, Anti-inflammatory, Antimicrobial and antitumor activities and is mostly preferred for various therapeutic purposes.

Monitoring Pesticide Residues in Agricultural Produce of Andaman and Nicobar Islands

Under the Monitoring of Pesticide Residue at National Level (MPRNL) project, 210 samples of fruits and vegetables were collected from various locations across the North, Middle, and South Andaman districts. The collection aimed to assess the extent of pesticide residue contamination in agricultural produce from the Andaman and Nicobar Islands. These samples were carefully packed and sent to the Export Inspection Agency (EIA) laboratory, designated by the Project Coordination Cell of MPRNL, New Delhi, for comprehensive pesticide residue analysis. The testing ensures compliance with safety standards and identifies potential risks associated with pesticide usage in the region. During the 16th Annual Meeting of MPRNL in August 2024, ICAR-CIARI proposed an expansion of the project scope. Specifically, an additional 24 samples of cereals per year were suggested for inclusion in the testing program to evaluate pesticide residue levels in staple crops of the islands. This proposal underscores the institute's commitment to ensuring food safety across various categories of agricultural produce.

Development of Panchamrit Mediated Silver Nanoparticles

In the initial experiments under the project *"Development of Panchamrit Mediated Silver Nanoparticles and Its Antimicrobial Activities"* at ICAR-CIARI, the synthesis of silver nanoparticles was visually confirmed. The reaction medium exhibited notable changes such as a shift in color, indicative of nanoparticle formation. However, effective separation and isolation of the nanoparticles were not achieved due to limitations in the current experimental setup. In the forthcoming phases, advanced separation techniques will be explored systematically to improve the yield and purity of AgNPs. These efforts will be aligned with the project's scientific objectives to ensure reliable and replicable outcomes.

Climate-Resilient Agriculture and Its Monitoring in Tropical Island Ecosystems

State Specific Action Plan - Water Sector and Climate Change Adaptation

A long-term analysis of rainfall data (1949-2019) for the Andaman and Nicobar (A&N) Islands revealed an average annual rainfall of 3079 ± 487.3 mm, with a variation of 15.8%. The total water demand for all sectors in the islands is approximately 32.78 MCM annually, with 17.56 MCM allocated for non-agricultural

purposes. Projections show that by 2031, 38.12 MCM will be needed, increasing to 45.2 MCM by 2041, and 53.06 MCM by 2051. To meet these demands, effective water harvesting, storage, and utilization practices must be adopted.

The interim report of the SSAP on climate change, submitted to the Andaman Administration for further submission to the Central Water Commission, highlights the islands' vulnerability to rising sea levels and temperature changes. These changes are expected to worsen coastal hazards like erosion, flooding, and storm surges, impacting infrastructure and livelihoods. Additionally, rising temperatures may reduce crop yields, increase fertilizer needs, and raise greenhouse gas emissions, while more extreme weather events such as cyclones and droughts will further harm agriculture. Adaptation measures to manage these climate impacts are crucial for the sustainability of the islands' agriculture and fisheries.

Gramin Krishi Mousam Sewa (Integrated Agromet Advisory Services) – 2024

During the period a total of 100 agromet bulletins were issued in multilingual format covering all aspects of agriculture production based on the weather forecast received from IMD, Pune with the help of multidisciplinary advisory team. It was aimed at minimizing the production losses by supporting informed decision making in farm operations and support marketing of farm produces. Under this programme, 12803 farmers were registered in mKISAN portal and agromet advisories were sent to them regularly in the form of SMS. Further, the services of All India Radio (AIR), Doordarshan, print media, KVK, VRC, social media and other means were effectively utilized to reach the farmers from remote islands. As per the guidance from IMD wastapp group were created block wise village level. A total 27 watsapp grouped is maintain by AMFU, Port Blair and provide inputs like Agro Advisory bulletin, IBF and forecast in pictorial format. On the occurance of extreme events IBF is issued to the Islands farmers and during last year 2024 a total 33 nos. of IBF is issued.

Cropping Window and Varieties in Rice-Maize Cropping System

An experiment titled "Determining Suitable Cropping Window and Varieties in Rice-Maize Cropping System under Island Ecosystem" is currently underway. As part of this study, a field trial involving three rice varieties was established on Bloomsdale Farm. The rice was transplanted on four different dates: 1st June, 15th June, 1st July, and 15th July, to evaluate the performance of the varieties under varying planting schedules.

Plate 9. Rice-Maize Cropping System

Division of Animal Science

Division of Animal Science

Germplasm collection, conservation, and characterization

Exploring the transcript variants and expression profile of germ line markers in goats

Primordial germ cells (PGCs) that give rise to the germ cells in the gonadsare characterized by expression pattern of germ line molecular markers like Vasa and Dazl. Molecular study of these markers helps in understanding the molecular mechanisms of specification and differentiation of the germ cells in goat.Tocharacterize the vasa transcripts of goat, total RNA was isolated from goat testis tissues and protocolfor reverse transcription, cDNA synthesis and PCR amplification was standardized. PCR product of 2.462 kb was separated by electrophoresis using 1.5% agarose gel.The purified PCR product was cloned into pJET1.2/blunt cloning vector, transformed into *E. Coli* strain (DH5α), and recombinant colonies containing insert was confirmed by colony PCR.

Reproductive Management

Moringa oleifera leaf extract in semen extender improves semen quality profiles ofTeressa goat bucks under tropical humid island ecosystem

Effect of *Moringa oleifera* leaf extract (MOLE) supplementation in semen extender on semen quality parameters in Teressabucks was assessed. A total of 25 semen samples from six bucks were selected for the study. Spermatozoa of 150 × 10^6 were incubated in 300, 500 and 700 µg of leaf extract as Gr II, III and IV, respectively. Liquid stored semen samples were analysed for motility, viability, total sperm abnormality, plasma membrane, acrosomal and nuclear integrities, seminal plasma intracellular enzymes (aspartate aminotransferase; AST, alanine aminotransferase; ALT and lactate dehydrogenase; LDH), and total antioxidant capacity (TAC) and spermatozoa malondialdehyde (MDA) and cholesterol efflux in comparison with control group (Gr I) for upto 72 h. Results revealed that leaf extract (500 µg/150×10^6 spermatozoa) treated semen had significantly ($P<0.05$) higher motility, viability, plasma membrane, acrosomal and nuclear integrities and TAC and had significantly ($P<0.05$) lower total sperm abnormalities, AST, ALT, LDH, MDA and cholesterol efflux compared to those in other *Moringa oleifera* treated and control groups at different hours of liquid storage. In conclusion, 500 µg *Moringa oleifera* leaf extract/150 × 10^6 spermatozoa is thesuitable dose for liquid semen preservation in Teressa goat.

Effect of age on sexual maturity and testicular morphometrics in Andamani boars

Effect of age on sexual maturity and testicular morphometric parameters in Andamani boars under tropical humid island ecosystem of Andaman and Nicobar Islands was studied. A total of forty-eight (n=48) healthy male piglets were randomly divided into eight groups, each containing six piglets. They were managed under standard management practices until

they reached their respective target ages. The target age groups were from one to six months (at monthly interval), followed by nine months and twelve months of age. The males in the age group from one to six months were sequentially castrated upon reaching their respective ages. A steady increase in scrotal circumference, testicular parameters, and sperm concentration was observed with age. Puberty was observed after 2 months, and sexual maturity at 6 months.

Plate 10. The plates showing testis and epididymis of different age groups studied

Comparative reproductive parameters of Teressa and Andamani goats under tropical island ecosystem of Andaman and Nicobar Islands

Reproductive parameters of two registered indigenous goat breeds of Andaman and Nicobar Islands (Teressa goat and Andamani goat) were compared.Twelve apparently healthy bucks (each six of Teressa and Andamani goat, 3-4 years) were selected. These bucks are maintained under uniform farm schedule. Semen samples were collection twice a week and standard semen quality parameters were evaluated. Liquid semen preservation study was conducted upto 72 hours with measurement of seminal parameters, seminal biochemical, and antioxidant parameters. Blood samples were collected at monthly interval to estimate the serum testosterone concentration. Libido parameters and reaction time were measured at the time of semen collection in bucks. Scrotal circumference, testis length, width, thickness, volume and weight were higher inTeressa than Andamani goat. Serum testosterone was higher Teressa than Andamani goat. Shorter reaction time and higher libido score were observed in Teressa than in Andamani goat. Semen quality profiles such as volume, mass activity, pH, sperm concentration, sperm motility, viability, and acrosomal integrity, seminal antioxidant and total cholesterol were higher and sperm abnormality, AST, ALT, malondialdehyde were lower in Teressa as compared to those of Andamani bucks. Similarly, liquid preservation incubation study revealed that sperm motility, viability, and plasma membrane integrity, acrosomal integrity and total antioxidant capacity were decreased as incubation period advanced whereas total sperm abnormality, cholesterol efflux, AST, ALT and malondialdehyde were increased as incubation period advanced in both Teressa and

Andamani goat bucks. These results showed that reproductive parameters were better in Teressa goat as compared to Andamani goat under tropical humid island ecosystem.

Serum fecundity biomarkers in Andamani goat

The objective of the study was to identify and evaluate potent serum biomarkers related to fecundity in Andamani goats. Serum samples were collected from 189 Andamani goats belonging to high and low fecundity groups based on twinning percentages. Serum levels of ERBB2, FGFR1, MAP3K19, GDF9, and IGF1R were analysed using a using Sandwich ELISA methodology. The analysis revealed that IGF1R levels were significantly higher in the low fecundity group as compared to the high fecundity group. No significant difference in the other markers between the two groups was observed. The higher IGF1R levels in the low fecundity group suggest its potential role in regulating reproductive traits, possibly influencing follicular dynamics or oocyte quality.

Adaptation to climate stress

Evaluation of climatic thermal stress on Andamani duck under semi-intensive system

Seasons	Micro climatic condition			Production performance		
	T°C	RH %	THI	HDEP %	HHEP (number)	Egg weight (Gms)
Jan-24	29.17	78.61	81.65	49.17±1.3	21.8±1.9	58.66±1.1
Feb-24	30.03	80.12	83.25	51.52±2.1	27.26±2.6	59.10±1.3
Mar-24	29.80	79.74	82.83	40.71±2.4	19.4±2.6	60.51±1.1
Apr-24	31.16	80.20	85.09	37.23±1.5	12.46±2.6	57.22±2.2
May-24	31.23	80.60	85.29	39.49±2.3	21.33±1.3	58.83±1.8
Jun-24	28.27	80.38	80.45	42.75±1.9	28.93±1.3	60.85±1.7
Jul-24	27.93	84.74	80.49	21.47±1.5	15.53±1.5	61.12±1.4
Aug-24	27.93	84.74	80.49	17.25±2.6	12.46±2.6	60.93±1.6
Sep-24	27.81	87.18	80.62	16.23±2.7	15.53±1.8	59.42±1.3
Oct-24	28.00	80.90	80.08	17.57±1.8	19.34±2.4	58.31±2.4
Nov-24	28.03	80.43	80.07	20.21±2.4	12.35±1.9	60.02±1.3
Dec-24	27.97	80.90	80.03	21.46±3.1	15.33±1.7	58.45±2.3
Overall values	28.93	81.55	81.70	31.25±6.6	221.63±3.3	59.41±2.1

T: Temperature; **RH**: Relative humidity; **THI**: Thermal Humidity Index; **HDEP**: Hen Day Egg Production; **HHEP**: Hen Housed Egg Production;

Andamani ducks were evaluated for its response to climatic thermal stress under semi-intensive system of management with balanced *adlibidum* feeding, automatic watering system, optimal lighting of 16 hours during laying period and swimming facility. Adult breeding Andamani ducks were under moderate thermal stress (80 to 89 THI) under semi-intensive system. Micro environmental temperature and humidity were beyond the thermo-comfort zone. However,

overall hen housed egg production for the 12 months of duration aligned with egg production potential and exceeded the documented total egg numbers per duck in 20 months. Recorded body weights of Andamani ducks under semi-intensive system at the age of sexual maturity and laying period were significantly higher than open range system. Body weights were; 1.45 ± 0.56 kg (pullet grower male) & 1.35 ± 0.46 kg (pullet grower female); 1.99 ± 0.31 kg (drakes)/ 1.65 ± 0.22 kg (ducks) at age of sexual maturity; 2.11 ± 0.15 to 2.18 ± 0.22 kg during laying period. The serum biochemistry of breeding ducks reflected normal values and were comparatively better than the other indigenous registered ducks.

Antimicrobial resistance and One Health

Antimicrobial resistance bacteria in food chain and environment samples

A total of 166 samples *viz*. feed (n=10), manure (n=10), vegetables (n=40), milk (n=10), curd (n=10), chicken retail shop (n=50), fish (n=8) and goat meat (n=8) were collected from different parts of Soth Andaman district. The samples were processed for isolation, identification and molecular confirmation of bacteria by standard procedures. Isolation of *E.coli* (n=40) was found to be highest followed by *K.pneumoniae* (n=37), *Salmonella spp* (n=32) and *Staphylococcus* spp (n=26). The common vegetables contaminated with bacteria were coriander, cauliflower, spinach and carrot. From chicken meat retail shop, a total of 20 *E. coli*, 15 *K. pneumoniae* and 8 *Salmonella* spp were isolated. Chopping board, knife, meat and water used for cleaning were contaminated with the bacteria.

Antibiotic sensitivity assay was done by Kirby- Bauer disc diffusion method according to CLSI guidelines. Overall, high level of antibiotic resistance was found in all the isolates. The bacteria which showed more than 50% resistant against common antibiotics were amoxiclav, erythromycin, ciprofloxacin, ampicillin/ cloxacillin and oxytetracycline.Prevalence of multidrug resistance in the isolated bacteria was found to be very high. 11% of the total isolates were resistant to more than 10 antibiotics while, 28% were resistant to more than 8 antibiotics. The common multi drug resistance was found against erythromycin, amoxiclav, sulphafurazole, ampicillin, ciprofloxacin, oxytetracycline.

Primary screening of all the isolates showed that a high resistance was observed against cefotaxime and ceftazidime. Base on the combined dis diffusion test assay, Salmonella spp showed maximum ESBL activity compared to other bacteria.All Gram negative bacteria showed presence of high number of ESBl and AmpC genes compared to *Staphyloccus* spp. Presence of biofilm genes was found to be more in *E. coli* and *K. pneumoniae* isolates compared to Salmonella and *Staphylococcus* spp.

Screening of all the isolates against carbapenems *viz*. imipenem, meropenem, ertapenem, showed that 37% of the *E. coli* and *Salmonella* spp and 20% *Staphylococcus* spp and 6% *K. pneumonieae* isolates were resistant. The high degree of resistant to carbapenems is very serious concern, as these group of antibiotics are the last resort antibiotics against ESBL resistant organisms.

Table 3 Antibiotic resistance among different pathogens (in percent)

Antibiotics	*E.coli*	*Klebsiella pneumoniae*	*Salmonella* spp	*Staphylococcus* spp
Co-Trimoxazole	40	44	0	0
Amoxyclav	76	68	37.5	66.7
Tetracycline	52	60	6.3	16.7
Sulphafurazole	64	60	0	0
Gentamicin	40	32	0	0
Erythromycin	100	84	31.3	50
Amikacin	32	12	6.3	0
Ciprofloxacin	76	60	31.3	50
Ampicillin/Cloxacillin	92	64	43.8	33.3
Ampicillin	64	60	12.5	16.7
Chloromphenicol	32	4	25	16.7
Oxytetracycline	48	76	31.3	33.3

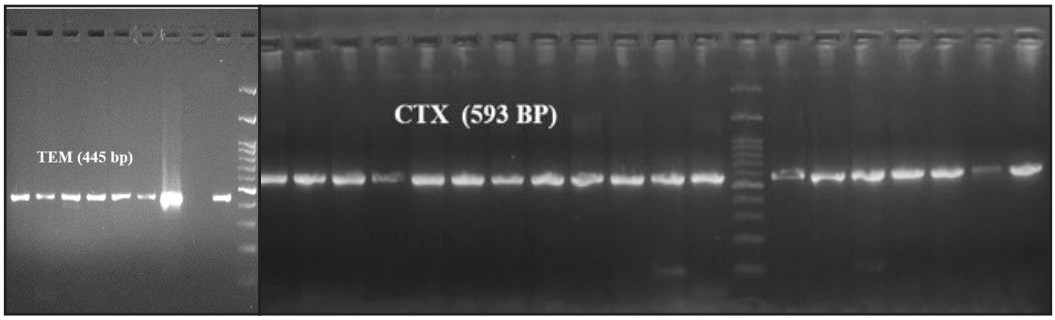


Fig 3. Amplification of *TEM* gene (445 bp) and *CTX* gene (539 bp)

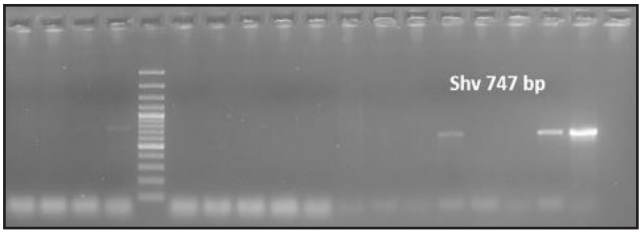


Fig 4. Amplification of *SHV* gene (747 bp)

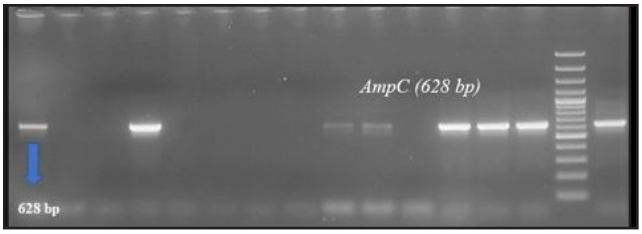


Fig 5. Amplification of AMPC gene (628 bp)

Molecular characterization of *Corynebacterium pseudotuberculosis* from goats in Andaman & Nicobar Islands

*Corynebacterium pseudotuberculosis*is the causative organism for caseous lymphadenitis (CLA) in goats and sheep. The disease is mainly manifested by formation of nodular abscesses in lymph nodes, skin, and in internal organs. Isolation and molecular characterization of the pathogen based on sequence information of 16SrRNA and RNA polymerase β subunit (rpoB) was carried out. A total of 13 isolates have been confirmed to be *C.pseudotuberculosis*. All the recovered from lymph nodes abscesses were Gram positive coccobacilli to short bacilli, non-sporulated, non-capsulated, non-motile

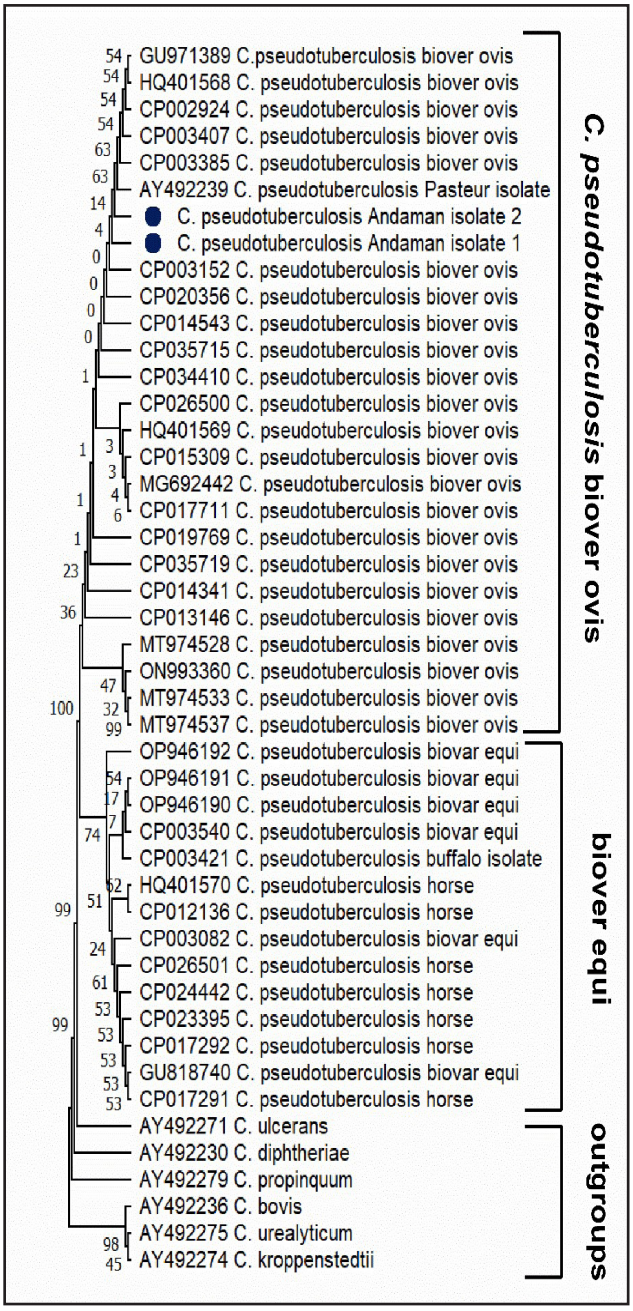


Fig 6. Biovar assignment of C. pseudotuberculosis isolates based on rpoB gene fragments. Phylogenetic tree was constructed by Neighbor Joining (NJ) method using Tamura-Nei model

and appeared single, pairs in acute angles (like Chinese letter) and in palisades arrangements. All the isolates were positive for urease, catalase and negative for nitrate reduction, gelatin liquefaction while the results of Sugar fermentation tests were glucose positive, trehalose negative and other sugars of variable results.BLASTn search result 16S rRNA matched with *C. pseudotuberculosis* (100% sequence identity) which indicated that Andaman isolates belong to *Corynebacterium pseudotuberculosis*. Biovar assignment of *C. pseudotuberculosis* Andaman isolates (n=2) was done based on partial sequence information of rpoB. Based on phylogenetic tree (Fig. 6), it was found that Andaman isolates were under *C. pseudotuberculosis* biovar ovis. Antimicrobial resistance study revealed that the isolates were 100% resistant against erythromycin and rifampicin. Fifty percent resistance was found against amoxicillin/clavulanic acid, ciprofloxacin, penicillin, and vancomycin. All the isolates were sensitive to tetracycline, chloramphenicol, cotrimoxazole, sulphafurazole, ampicillin/cloxacillin and oxytetracycline.

Monitoring and surveillance of important animal diseases

Monitoring and surveillance of Foot and mouth disease (FMD)

In the year 2024, no clinical case of FMD was reported from Andaman and Nicobar Islands. As a part of sero-surveillance, a total of 720 cattle sera samples were screened for the presence of 3rAB3 antibodies by DIVA-ELISA (differentiating infected from vaccinated) test, in which 24 samples were found DIVA positive (3.3%). It is noteworthy to mention that DIVA positivity has been reduced compared to previous years (Fig. 7). For sero-monitoring of NADCP-4th round, a total of 463 pre-vaccination

and 443 post-vaccination sera samples from cattle were analyzed for protective antibody titers. Protective antibody titers (log10 titer ≥ 1.65) for pre vaccinated samples were detected in 107 (23%), 99 (21%), and 123 (27%) samples for serotypes O, A, and Asia 1, respectively. For post-vaccination samples the protective antibody titers (log10 titer ≥ 1.65) were observed in 97 (22%), 62 (14%), and 78 (18%) samples for serotypes O, A, and Asia 1, respectively.

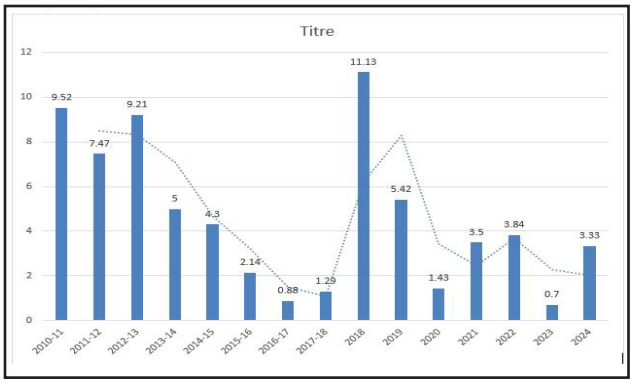


Fig 7. Trend of DIVA positivity in bovine sera samples

Sero-surveillance and monitoring of important livestock diseases of Andaman and Nicobar Islands

A total of 200 cattle sera samples were screened for the presence of *Brucella abortus* antibodies by Rose Bengal Plate Test. None of the sample was found positive. Out of 182 goat sera samples screened for the presence of *peste des petits ruminants virus* antibodies (PPRV), none of the sample was found positive. During the reporting period, three outbreaks of contagious ecthyma (Orf) with attack rate of 9.4% and one outbreak of caseous lymphadenitis with attack rate of 7.4% in goats were reported.

Nutritional Management

Nutrient intake and digestibility of the Nicobari Pigs in intensive system of rearing

Farmer rearing pigs at island condition incurs more than 80% cost on feed alone. Thus, a balanced ration with proper management can offer the farmers with maximum profit from the venture. This workwas thus targeted to optimize protein level in Nicobari pigs and ascertain the nutritional requirement by the animals. A feeding trial with Nicobari piglets with three treatment groups is going on. All the piglets were fed with creep ration 7 days post-birth to weaning. After the weaning the piglets were distributed in three groups, Control (comprising of male and female piglets, n=8), Male group (n=5) and Female group (n=8). The control group diet had 18.5% CP and 3000 MJ/kg energy, while male and female group received 14.8% CP and 3000 MJ/kg energy. The initial body weight of the animals was 6.54 ± 1.54, 7.92 ± 1.47 and 7.43 ± 1.59 for Control, Male and female groups, respectively. The animals are in first phase of growth and the second phase of growth will be initiated with digestibility trial and change in CP and energy content in the diet.

Performance of the common fodders and their nutrient digestibility in farm animals in island condition

All livestock need fodder as their main chunk of food every day. Animals like cattle and goat of medium yielder in nature need more than 60% daily ration as fodder. The livestock production in the islands faces several hinderance, of which feed and fodder supply is

main. To solve this problem the present project was undertaken to study the feed consumption and nutrient digestibility of different fodders-based ration. Out of 5000 sqm area of land 3750 sqm area was developed for sowing fodder trees and remaining for high yielding grasses. The sowing plan comprised of close spacing & high-density sowing (2 X 2, 1 X 1.5 & 1 X 1 (meters) spacing). For this following tree saplings were produced and planted

1	Subabul	1300 (sapling)
2	Jack fruit	450 (sapling)
3	Sesbania grandiflora	2000 (sapling)
4	Albizia lebbeck	600 + (sapling)
5	Chakrapani	700 (sapling)
6	Gmelina arborea	450 (sapling)
7	Dendrobium umbellatum	200 (sapling)

At present Sesbania grandiflora, Subabul and Albizia lebbeck started production, which are being harvested and the goats are being conditioned. Soon digestibility trial will be conducted to study nutrient intake and nutrient utilization in goats and cattle.

Productivity improvement in livestock

Enhancing the productivity of Andamani goat

During the reporting year, a total of 286 farmers have been registered in 40 villages. The overall least square means of body weights (kg) at birth, 3, 6, 9 and 12 months of age were 1.45 ± 0.17, 6.16 ± 0.32, 10.03 ± 0.12, 12.55 ± 0.11 and 16.37 ± 0.12 respectively. Kidding percentage of 153.65 with multiple birth of 46.09% were recorded from the present flock. During the period, 1020 kids were born with overall population growth of 94%. Body weight at 6, 9, 12 Months shows medium to high heritability. Further 6th month body weights have better genetic correlation with other parameters. Hence considering the both the heritability and correlation, it may be suitable to select Andamanigoat by 6 months body weights. A total of 11 bucks have been distributed in the adopted clusters. Sixty-eight male kids were selected, on the basis of 6-month body weight and 60 days milk yield for future breeding purpose. The selection differential of 0.92 kg body weight and 72.60 ml milk yield of dam for 60 days over population mean were observed. The selection intensity for body weight was 1.45 and for milk yield was 1.32 respectively. During the year, no major disease outbreak was reported from the goats. A total of 2107 goats were given the deworming and 228 for dipping for ectoparasite infestation. The overall mortality during the period was 4.42%, however the highest mortality was observed in the adult age group. Technology of semen collection and artificial insemination with liquid semen has been standardized. So far, a total of 302 AI has been done in the adopted clusters with success rate of 50.66%. Standardized and implemented Faffa Malan Chart (FAMACHA) chart to use as a diagnostic aid to correlate the anaemic status of the goats with worm load and blood profile. A total of 11 training/awareness programmes/ field day were conducted, of which 340 farmers (178 males and 162 females) were benefitted. The economics of the present flock has been calculated. The net income per animal per year was found to be Rs. 5669.4. Similarly, the net income per doe productivity was found to be Rs.

18947.9 with 10.60% increase in the income. Our unit has contributed significantly towards the livelihood security through the technological intervention *viz*. increase in weaning weight (21.9%) and 12 months (12.58%), reduction in mortality (less than 5%), increase in milk yield (11.37 %) and increase in knowledge of scientific breeding, management and health practices. Five successful goat entrepreneurs have been promoted for multiplier flock.

Table 4 Growth performance of effect of AICRP Bucks (Kg)

Category	Birth_wt	3 month_wt	6 month_wt	9 month_wt	12 month_wt
AICRP	1.45± 0.17 (n=621)	6.16± 0.32[a] (n=387)	10.03± 0.12[a] (n=377)	12.55± 0.11[a] (n=320)	16.37± 0.12[a] (n=267)
NON-AICRP	1.44±0.007 (n=598)	5.86±0.09[b] (n=489)	8.64±0.03[b] (n=436)	11.24±0.14[b] (n=395)	14.95±0.30[b] (n=285)

Enhancing the productivity of Andamani pig

During this reporting year total 27 farrowings were recorded with 196 piglets. Salient parameters like litter size at birth (no.), litter weight at birth (kg) and litter size at weaning (no.), were recorded as 7.20 ± 0.19, 11.29 ± 0.61, 6.83 ± 0.19 respectively. Average litter size at birth per sow was 6.63 ± 0.31, average litter weight at birth per sow was 11.02 ± 0.77, average litter size at weaning per sow was 6.54 ± 0.57, average litter weight at weaning per sow was 43.01 ± 2.02. Overall, pre-weaning mortality percentage was 5.58 and post-weaning mortality percentage was 0.14. Technology of artificial insemination, oral iron supplementation to control iron deficiency anaemia in piglets and probiotics supplementation to alleviate weaning stress in piglets have been standardized and popularized. A total of 9 training/awareness programmes/field day were conducted, of which 332 farmers were benefitted. Moreover 172 piglets were distributed/sold among the farmers.

Herbal management of livestock ailments

Evaluation of traditional knowledge of plants in the management of *Rhipicephalus microplus* in cattle and goat

Efficacy of a polyherbal acaricide was tested under the field condition in an organized goat farm situated at Mithakharivillage of South Andaman District. A total of forty-three tick infested (≥ 50 ticks/animal) goats were considered for the study. Twenty animals were left untreated (control group), twenty animals were treated with the polyherbal acaricide (treatment group) and thirteen animals were treated with doramectin (positive control group). The animals of both polyherbal and doramectin groupscured after 96 h indicating a 100% efficacy of the polyherbal product.Before and after the treatment, body weight of the animals was taken at 7 days interval up to two months. No significant difference in body weights among the groups was observed, indicating that the treatments did not significantly affect weight gain.

Impact assessment

Impact assessment of CIARI technology "Dweep Humpsore Gau Maa Rakshak"

The impact of "Dweep Humpsore Gau Maa Rakshak" technology on milk yield and on farmers income was quantified.This outcome-based impact assessment was done by collecting data of 80 treated milking cattle from 51 farmers in the South Andaman district. Among the beneficiaries, 88.75% reported an increase in milk yield following the treatment, with 55% perceiving a slight increase (≤0.5 liter), 21.25% noting a moderate increase (≤1 liter), and 12.5% observing a considerable increase (>1 liter). The mean increase in milk yield was 0.61 liters, which, at an average selling price of ₹71 per liter, generated a net incremental benefit of ₹10,120 per animal per year for farmers using this technology. Results from paired t-tests confirm that the observed differences in milk yield are statistically significant at the 1% significance level. Additionally, as stress levels reduced following the treatment, over half of the treated animals (56.79%) came into heat after undergoing Tri-Model therapy.

Table 5 Results for paired t test

Variable	Observations	Mean	Standard error
Milk yield before treatment	80	5.64	0.263
Milk yield before treatment	80	5.03	0.240
difference	80	0.61***	0.048
t	12.62	df=79	
p	0.00	-	-

Division of Fisheries Science

Division of Fisheries Science

Marine capture fisheries

Fishery, biology, and market potential of tuna resources on Minicoy Island

The Lakshadweep Islands, recognized as a significant tuna hub in India, primarily employs the traditional pole-and-line fishing method to harvest tuna resources. A comprehensive study was conducted to analyze the transition in tuna fishing practices and the subsidiary use of live bait on the island, utilizing a pre-tested interview schedule. The mechanization and motorization in the fishing sector, especially in craft and gear technology substantially increased the production and processing of tuna in the Minicoy Islands. There was a total of 52 vessels (laanchi) of length ranging from 5.9 to 18.3 m operated from the 11 fishing villages of Minicoy Islands at a distance of 4 to 18 nautical miles from the shore. During this period, 505 tuna specimens were dissected for biological analysis, revealing that crabs constituted the primary food source, followed by megalopa, squid, Acetes shrimps, digested fish, and various baits. Additionally, suitable live bait fish species for pole-and-line fishing were documented for Minicoy Island, as presented in Table 6.

Table 6. Live bait species recorded in the pole and line fishery of Minicoy Islands

S. no	Family	Species	Common name	Local name (Mahl)
1.	Dussumieridae	*Spratelloides gracilis*	Silver-stripe round herring	Rehi
2.		*Spratelloides delicatulus*	Delicate round herring, Blue sprat	Hondeli
3.		*Dussumieria elopsoides*	The slender rainbow sardine	Karshi Gumbla
4.	Apogonidae	*Taeniamia fucata*	Orangelined cardinalfish	Rybodi
5.		*Fibramia thermalis*	Half-barred cardinal	Dombodi
6.		*Zoramia leptacanthus*	Threadfin cardinalfish	Dikkuribodi
7.		*Rhabdamia gracilis*	Luminous cardinalfish	Rehibodi
8.		*Verulux cypselurus*	Swallowtail cardinalfish	Digubodi
9.		*Ostorhinchus apogonoides*	Short-tooth cardinal	Bondu
10		*Ostorhinchus fasciatus*	Broadbanded cardinalfish	Rumkuribodi

S. no	Family	Species	Common name	Local name (Mahl)
11.	Caesionidae	*Caesio caerulaurea*	Blue and gold fusilier	Hudenmugurang
12.		*Caesio xanthonota*	Yellowback fusilier	Donkevunias
13.		*Pterocaesio chrysozona*		Kekkunmugurang
14.		*Gymnocaesio gymnoptera*	Slender fusilier	Geretha
15.		*Pterocaesio pisang*	Banana fusilier	Rymugurang
16.		*Pterocaesio tile*	Dark-banded fusilier	Rymugurang
17.	Pomacentridae	*Chromis ternatensis*	Swallowtail Puller	Nilamahi
18.		*Pycnochromis nigrurus*	Blacktail chromis	Idugidari
19.		*Pomacentrus pavo*	Sapphire damsel	Huibu
20		*Lepidozygus tapeinosoma*	The fusilier damselfish	Bureki
21.	Atherinidae	*Atherinomorus lacunosus*	Wide-banded hardyhead	Fitham
22.	Congridae	*Ariosoma Sp.*	Sand eel	Fula
23.	Acanthuridae	*Acanthurus lineatus*	Lined surgeonfish	Kuda Raikathi
24.	Exocoetidae	*Exocoetus volitans*	Tropical two-wing flying fish	Fulangi
25.	Holocentridae	*Sargocentron spiniferum*	Sabre squirrelfish	Raiverimas

Applications of ICT tools in decision making

Coastal fisheries information hub in Car Nicobar Island

The Coastal Fisheries Information Hub, established in collaboration with the tribal council, has become fully operational at Car Nicobar Island, serving as a crucial resource center for the Nicobarese tribal community focused on marine conservation and employment opportunities. The Hub, equipped with modern facilities, facilitates knowledge sharing, capacity building, and community engagement. Community members have actively participated in sea turtle conservation and marine biodiversity surveys through targeted training and awareness programs. Notable achievements include the rescue of a Hawksbill turtle (*Eretmochelys imbricata*) from a ghost fishing net and the identification of key turtle nesting sites. Additionally, the NICMIS (Nicobar Coastal Management Information System) mobile application has been approved by ICAR, New Delhi, enhancing the use of ICT tools for resource management. By harnessing citizen science, the project monitors coral reef health, sea turtle nesting, and the presence of endangered marine species, contributing to the development of an Island management plan for Car Nicobar. To further support local fishermen, we have distributed essential fishing inputs, including two FRP fishing boats, outboard engines, and GPS devices, thereby enhancing their livelihoods and employment opportunities.

Island-based information management system for decision-making

The project aims to utilize an interactive web GIS application to effectively map and visualize critical agricultural information, including boundaries, natural resources, demographics, and agroeconomic factors. The Dweep Geo-portal developed through this initiative offers a detailed baseline map of the Andaman and Nicobar Islands, featuring key geographical elements such as road names, village boundaries, and geomorphological characteristics related to the agriculture and allied sector of the Island. The portal also showcases the production zones for essential crops and provides production, and distribution maps for multiple years, enhancing accessibility to important agricultural data for the stakeholders. Moreover, the web GIS platform supports the creation of thematic maps and data sheets, benefiting scientists, resource managers, and policymakers. Notably, a total of 1,560 fish ponds across the region were delineated with vital, district, and tehsil-level data, thereby facilitating informed decision-making and strategic planning within the fisheries sector.

Aquaculture

Mapping the tsunami inundated water bodies of South Andaman for aquaculture

This study aims to assess land suitability for resilient aquaculture development in inundated areas of South Andaman Island, specifically focusing on fish, crab, and shrimp culture. Utilizing Geographic Information System (GIS) techniques alongside Multi-Criteria Analysis (MCA) and the Analytical Hierarchy Process (AHP), the research evaluates five selected inundated areas: Flat Bay, Namunagar, Sippighat, Ograbrach, and Wandoor. A total of 13 criteria, encompassing physical and chemical water parameters, topography, and social infrastructure, were analyzed. Spatial interpolation maps created from field surveys and remote sensing data reveal that Sippighat (107.5 ha) and Flat Bay (6.9 ha) have significant potential for shrimp culture, while Wandoor shows promise for crab culture, highlighting an opportunity for government-supported expansion in suitable areas like Wandoor, Flat Bay and Sippighat. Overall, 199.2 ha were identified as moderately suitable for shrimp aquaculture activities. Seasonal analysis of soil and water quality parameters is in progress to develop suitability maps for brackish water aquaculture activities on the Island.

All India Network Project on Mariculture (AINP)

Seaweed cultivation trials were carried out in Chidiyatapu and marine hill foreshore areas. In the seaweed cultivation trail, the raft prepared with bamboo was spoiled due to algae growth, high maintenance requirements, excessive weight, and difficulty in transport. Based on the first trial, bamboo was replaced with PVC pipes for making rafts offering lightweight and required low maintenance. Later seaweed cultivation trials were conducted in Chidiyatapu using 1 × 1m^2 plastic rafts anchored with well rings using tube net cultivation method. Seaweeds such as *Gracilaria edulis, Gracilaria salicornia* sp, and *Acanthophora sp.* were collected from

the selected sites on Burmanallah coast, South Andaman, and were used for cultivation trails. The PVC pipes were cut into 01m pieces to make square-shaped rafts, and 02-inch PVC pipes were used for it. A line of 8-10 square rafts were deployed, supported with 12mm and 6mm sized rope was used and 02 nos well ring was anchored on both sides. A half-inch mesh-size fishing net was used in making seaweed pouches in tube form as a substrate for seaweed growth. The net was cut into 04-inch width and 03m in length and added with 1 to 1.2kg of seaweed into each square raft. According to growth trials, *Gracilaria salicornia* and *Acanthopora spcifiera* showed an increase in the biomass of seaweed four to fivefold in 60-65 days. A total of 90 rafts were deployed since March 2024 for cultivation trials of seaweeds in Chidiyatapu and Marine Hill waters.

Plate 11. Seaweed Cultivation

Indoor bio floc culture trials

To enrich the biofloc culture system with zooplankton, a 30-day trial was undertaken to evaluate the effects of different carbon sources like sugarcane jaggery (SG), rice bran powder (RB), and a mixture of rice bran on the multiplication of freshwater zooplankton *Moina micrura* in

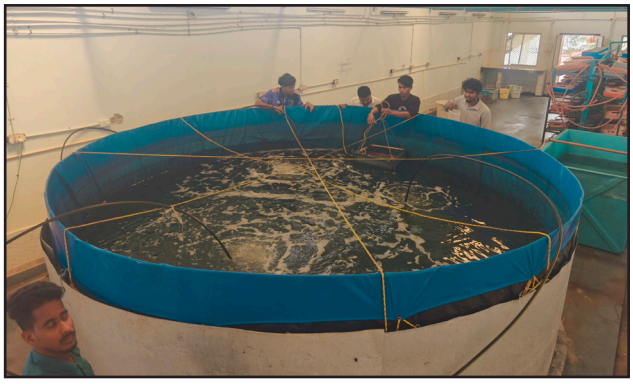


Plate 12. Indoor bio floc culture trials

biofloc system of 100 L volume. Adult *Moina micrura* was inoculated into each treatment @ 10 $NosL^{-1}$. In control tanks yeast was given as food and for other treatments biofloc inoculum was prepared with ammonium sulphate as a nitrogen source and different carbon sources as per respective treatments. The floc volume, Total Ammonia Nitrogen (TAN), turbidity, Toral Plate Count (TPC), Total Suspended Solids (TSS), pH, and alkalinity parameters were measured in each treatment. The study found that Biofloc and rice bran (BFRB) treatment showed a significant increase in the population of *Moina micrura* (120±5 Nos L^{-1}) than Biofloc sugarcane jaggery (BFSJ) (16±3 Nos L^{-1}), BFSJ+RB (30±5 Nos L^{-1}) and control (40±6 Nos L^{-1}). In BFRB treatment the maximum number of *Moina sp* population was attained in 21 days and then the number decreased, whereas in other treatments and control showed that the peak number reached 15 days and then decreased.

Integrated Farming System (IFS) model for sustainable livelihood

The coconut-based Goat- fish- Poultry-vegetable-fodder-system proposed and introduced suitable breeds and a variety of animals and plants in Minicoy, Lakshadweep. The shelters, ponds,

and other facilities were made to accommodate the livestock and fisheries. The entire IFS area (1 acre) is covered by 7 to 15-year-old coconut palms of a variety of Laccadive ordinary and Laccadive micro. A total of 147 coconut palms in the area were scientifically planted with 7.5m spacing between the palms. Goats (Konkan kanyal and non-descriptive); Chicken (Sasso, Gramasree, Thalssery nadan, Kadaknath, White leghorn); duck (Chara- chempalli); fish (Indian major carps and Pearlspot) were introduced, and their growth performance was evaluated. The quantity of waste developed and recycled within the ecosystem was also evaluated for its sustainable utilization. The fodder grass CO5, red Napier; vegetables like bottle gourd, cherry tomatoes, pumpkin, Malabar spinach, Culantro, Tahitian spinach were planted within the system and evaluated the yield and performance. The spices (Pepper, Cinnamon, Allspice, Clove); tubers, and fruit crops are also intercropped in the coconut garden. Field-level demonstration and training programs were conducted for tribal farmers from Amini, Kavaratti, Kadmat, and Minicoy Islands of Lakshadweep, and a total of 116 participants attended and benefitted from the training program. The model of IFS-demonstration unit ICAR-CIARI, RS Minicoy was also displayed in Coco Fest held at Kavaratti, Lakshadweep to encourage the coconut farmers across the archipelago to adopt the technology and to earn additional income.

In-vitro bioactive potential of seaweeds and its immunomodulatory effect on fish

Three seaweed species such as *Gracilaria edulis, Padina tetrastromatica* and *Halimeda opuntia* were selected for *in-vivo* analysis. FTIR and GC-MS analysis were carried out to identify and characterize the bioactive compounds present in these three seaweed species (Fig. 8). The study identified the presence of various compounds, including polysaccharides, amino acids, alkenes, phosphine, aromatic amines, lignins, phospholipids, and carboxylic acids. GC-MS analysis further identified organic compounds and fatty acids in the seaweed species. The study detected a range of compounds, including polysaccharides, amino acids, and various fatty acids, with caproic acid and oleic acid being notably abundant. All seaweed extracts exhibited significant antioxidant, antibacterial, anti-inflammatory, and antifungal properties, while also serving as rich sources of omega-3 and omega-6 fatty acids. The mineral profile analysis

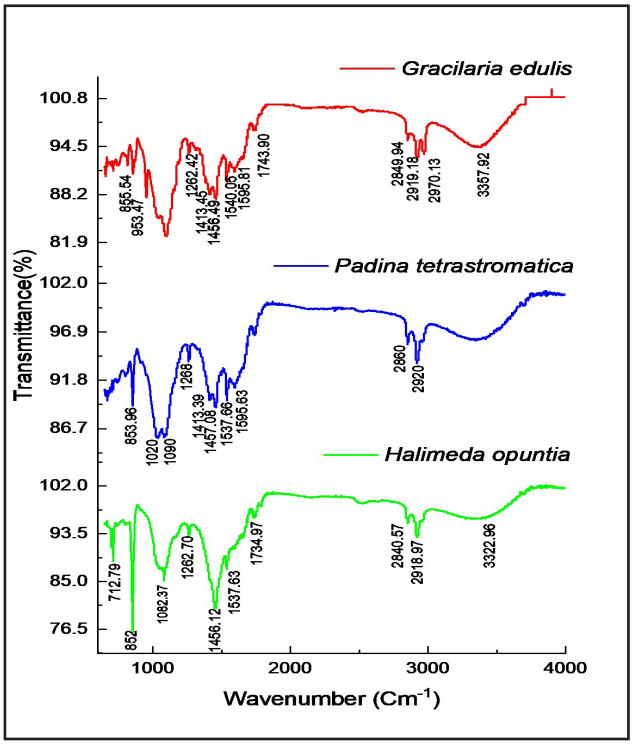


Fig 8. FTIR spectral graph for the selected seaweed species

revealed the presence of 23 major, minor, and trace element minerals in *Gracilaria edulis* and *Padina tetrastromatica*, while *Halimeda opuntia* contained 19 major and minor minerals. Additionally, a brine shrimp lethality test assessed toxicity, and in-vivo trials on *Labeo rohita* demonstrated enhanced growth and improved hemato-immunological parameters in fish fed with a combination of seaweed extracts at 3 g/kg feed, indicating their potential in aquaculture.

Fish health monitoring and management

National Surveillance Program for Aquatic Animal Diseases (NSPAAD)

Baseline data was collected from 86 freshwater fish farms in the Andaman Islands, revealing 21 reported disease cases attributed to various infectious and non-infectious conditions, including bacterial, parasitic, fungal, and water quality-related issues. Notably, the study characterized *Piscinoodinium* sp., which was linked to epizootics and mortality in local freshwater fish. Additionally, the cymothoid isopod parasite *Renocila bijui* was documented for the first time in two new host species, *Chrysiptera unimaculata* and *Acanthurus xanthopterus*. All data, including disease cases and biological information, were submitted to the National Database on Aquatic Animal Diseases. An assessment of fish farmers' awareness regarding aquatic animal health management was conducted with 305 participants, leading to recommendations for improved practices. To enhance stakeholder knowledge, eight awareness programs were held, benefiting 196 participants, and the 'ReportFishDisease' mobile app was promoted for real-time disease reporting. Furthermore, technical support and training were provided, notably assisting young aquapreneurs in shrimp farming in South Andaman, which garnered recognition from ICAR, New Delhi, as a success story.

Plate 13. Investigation of disease cases in fish farms of Andaman Islands

All India Network Project on Antimicrobial Resistance (AINP-AMR)

Antimicrobial resistance (AMR) poses a significant global public health challenge, prompting the launch of the All-India Network Project on AMR (AINP-AMR) to study its dynamics and establish surveillance in the fisheries and livestock sectors. As part of this initiative, freshwater ecosystems in the Andaman and Nicobar Islands were targeted, with a focus on organisms such as *E. coli, Staphylococcus* spp., *and Aeromonas* spp. The collection of fish and water samples from 20 freshwater fish farms in South Andaman has been completed,

and isolation of target organisms is underway, in adherence to the project's standards. To enhance stakeholder awareness, an informative program titled "Antimicrobial Resistance (AMR) in the Context of One Health" was held in Wandoor, South Andaman on November 22, 2024. The event, attended by 34 participants (20 men and 14 women), facilitated discussions on the implications of AMR and strategies for its mitigation across human, animal, and environmental health.

Management of parasitic diseases in freshwater fishes

A total of four medicinal plants such as, *Psidium guajava, Terminalia catappa, Anacardium occidentale, Andrographis paniculata*, and tuber varieties *viz., Dioscorea* spp. Achinwhite, Thakinya thakavu, NIC-DA-5, Antounth were collected from South Andaman and Nicobar Islands, respectively. The aqueous extracts of these plant products were tested for the efficacy of antiparasitic activity. Also, salt magnesium sulfate was tested for its antiparasitic efficacy. The Western mosquito fish *Gambusia holbrooki* of size 2.5 ± 0.8 cm was used as a test organism in LC50 studies. The LC50 for *Terminalia catappa*, *Anacardium occidentale*, *Psidium guajava*, *Dioscorea* sp. (4 varieties), and magnesium sulfate showed no mortality upto 1000 ppm on the test animal. However, *Andrographis paniculata* aqueous extract showed 50% mortality at a concentration of 635 ppm. Hence a concentration below 500 ppm has been chosen as a safe level for fishes for evaluation of antiparasitic activity. *In-vitro* test of the antiparasitic effect of *A. paniculata* aqueous extract against *Argulus japonicus* showed that the application of the test solution at 150, 200, 250 and 300 ppm caused 90 to 100 percent mortality at 120, 150 and 180 minutes (Figure. 9). The invitro antiparasitic activity tested against nematode model using aqueous extract of *A. paniculata* demonstrated that 100, 200 and 300 ppm of the test solution has an antiparasitic efficacy of 100% at 24 and 48 hrs, which is very similar to the positive control (levamisole) used in the experiment.

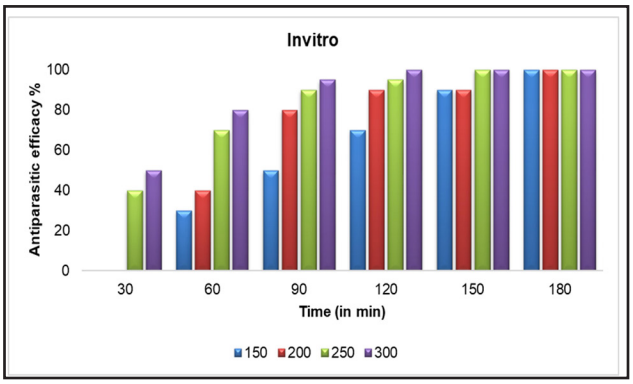


Fig 9. In-vitro antiparasitic activity of A. paniculata against *A. japonicus*

Field Crop Improvement and Protection Section




Field Crop Improvement and Protection Section

Germplasm collection and conservation

A total of 44 accessions of different crops were collected from various parts of North, Middle, and South Andaman as well as Nicobar districts. These include 5 accessions of sponge gourd (*Luffa cylindrica*), 3 accessions of ridge gourd (*Luffa acutangula*), 2 accessions of bottle gourd (*Lagenaria siceraria*), 1 accession of tree bhendi (*Abelmoschus caillei*), 4 accessions of cowpea or yard long bean (*Vigna unguiculata* ssp. *sesquipedalis*), 9 accessions of ivy gourd (*Coccinia grandis*), 1 accession of Malabar spinach (*Basella alba*), 1 accession of thorn less ber (*Ziziphus sp.*), 2 accessions of wild melon (*Cucumismelo var. agrestis*), 1 accession of bitter gourd (*Momordica charantia*), 5 accessions of chili (*Capsicum* spp.), 1 accession of balloon vine (*Cardiospermum halicacabum*), 1 accession of beach pea (*Vigna marina*), 1 accession of ash gourd (*Benincasa hispida*), 1 accession of brinjal (*Solanum melongena*), 1 accession of Indian night shade (*Solanum violaceum*), 1 accession of mung bean (*Vigna radiata*), 1 accession of clove bean (*Ipomoea muricata*), 1 accession of Burma dhania (*Eryngium foetidum*), and 2 accessions of cucumber (*Cucumis sativus*). Vegetatively propagated germplasm has been conserved in the Institute's Field Gene Bank. Seeds are being multiplied for submission to the National Gene Bank. An Ivy Gourd Field Gene Bank has been established with 20 accessions conserved to date from various parts of the Andaman and Nicobar Islands. Apart from new collections, existing rice and pulse germplasm were multiplied and conserved. A total of 101 rice germplasm and 125 Multi-parent Advanced Generation Inter-Cross (MAGIC) lines were multiplied and conserved for breeding programs. Additionally, 103 pulse germplasm, including 59 mung bean and 44 urd bean, were multiplied enough quantity for conservation.

Plate 14. Field view of ivy gourd Field Gene Bank

Plate 15. Field view of germplasm maintenance of rice

Characterization and Evaluation

Evaluation of onion varieties under Island conditions

A total of 10 improved onion varieties, namely BhimaShubhra, Bhima Shakti, BhimaKiran, BhimaSafed, BhimaShweta,

Bhima Raj, Bhima Super, Bhima Red, Bhima Dark Red, and Bhima Light Red, obtained from ICAR-DOGR, Pune, were evaluated for their suitability as spring onions under open field conditions in South Andaman during the Rabi season of 2023-24. (Plate 15) The first nursery was sown on November 1, 2023, with subsequent sowings at 15-day intervals, resulting in a total of three sowings. Seventy-day-old seedlings were transplanted onto raised beds with a spacing of 20 × 10 cm. The first crop was harvested approximately 80 days after planting, on March 28, 2024. Observations were recorded for various parameters, including plant height (cm), number of leaves per plant, neck thickness (mm), bulb diameter (mm), TSS (°Brix), chlorophyll content, dry matter (g), and plant weight (g). BhimaShubhra performed the best across all sowing dates, yielding the highest fresh weight per plant (36.76 g) and exhibiting the highest chlorophyll content (16 mg/g) in the first sowing date. Bhima Shakti also showed strong performance, especially in the second and third sowing dates, with a fresh weight of 19.3 g and 25.2 g per plant, respectively (Table 7). A general decline in both yield and chlorophyll content was observed as sowing dates were delayed, with the lowest values recorded for the fourth sowing date across all varieties.

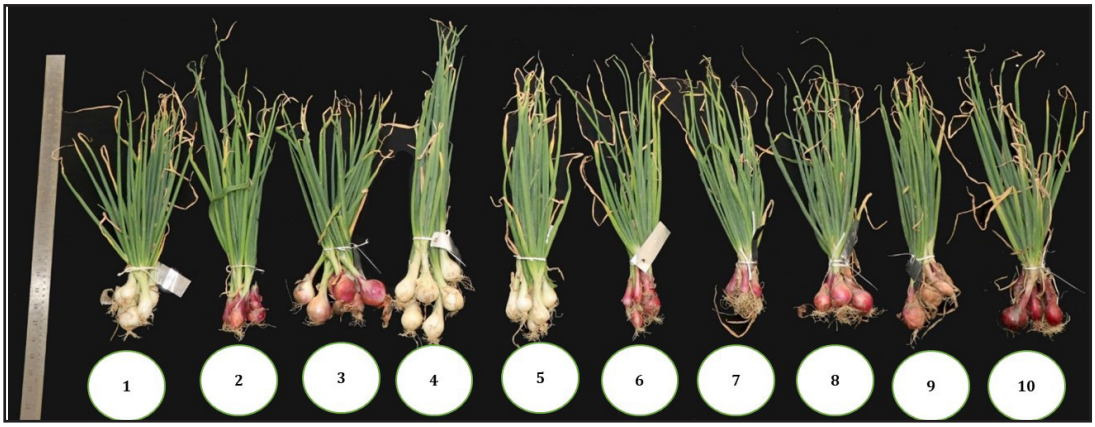


Plate 16. Images of ten onion varieties

Table 7 Performance of onion varieties across all sowing dates during *Rabi* season 2023-24

Variety	Characters	Sowing Date 1 (Nov 1, 2023)	Sowing Date 2 (Nov 16, 2023)	Sowing Date 3 (Dec 1, 2023)
Bhima Shubhra	Fresh weight (gm)	36.76	13.60	22.80
	Chlorophyll (mg/g)	16.00	15.00	5.5.00
Bhima Shakti	Fresh weight (gm)	31.20	19.30	25.20
	Chlorophyll (mg/g)	14.00	14.40	5.50
Bhima Kiran	Fresh weight (gm)	33.00	16.40	19.00
	Chlorophyll (mg/g)	16.00	21.70	7.7 0
Bhima Safed	Fresh weight (gm)	25.90	9.30	10.50
	Chlorophyll (mg/g)	12.00	14.40	7.10

Variety	Characters	Sowing Date 1 (Nov 1, 2023)	Sowing Date 2 (Nov 16, 2023)	Sowing Date 3 (Dec 1, 2023)
Bhima Shweta	Fresh weight (gm)	27.10	4.30	10.70
	Chlorophyll (mg/g)	8.00	11.40	6.30
Bhima Raj	Fresh weight (gm)	26.60	9.40	11.80
	Chlorophyll (mg/g)	13.00	12.90	6.40
Bhima Super	Fresh weight (gm)	24.20	6.40	2.00
	Chlorophyll (mg/g)	16.00	21.70	4.90
Bhima Red	Fresh weight (gm)	24.00	11.70	11.70
	Chlorophyll (mg/g)	13.00	10.70	5.20
Bhima Dark Red	Fresh weight (gm)	28.40	6.10	3.30
	Chlorophyll (mg/g)	10.00	11.90	6.40
Bhima Light Red	Fresh weight (gm)	23.20	3.90	3.20
	Chlorophyll (mg/g)	13.00	8.80	4.50

Evaluation of sesame varieties

A preliminary evaluation of six sesame varieties name TMV-3, TMV-4, Thilarani, kayamkulam-1, Thilak, Thilathara (Plate 17) was conducted using a Randomized Block Design (RBD) with three replications during the January to April.

Plate 17. Images of six sesame varieties A: TMV-3, B: TMV-4, C: Thilarani, D: kayamkulam-1, E: Thilak, F: Thilathara

Table 8. ANNOVA table of the sesame traits

Parameter	F-Statistic	P-Value	Significance
Plant Height	2.03	0.146	Not significant
Primary Branches	5.3	0.008	Significant
Days to 50% Flowering	11.37	0.0003	Highly significant
No. of Capsules per Plant	3.14	0.048	Significant
1000 Seed Weight (g)	20.48	0.00002	Highly significant

The ANOVA analysis shows that Days to 50% Flowering and 1000 Seed Weight exhibit highly significant differences ($p < 0.01$) among sesame varieties, indicating strong varietal effects. Primary

Branches and Number of Capsules per Plant show significant differences ($p < 0.05$), suggesting moderate varietal effects. Plant Height does not show significant differences ($p > 0.05$), indicating uniformity across varieties (Table 8). The results highlight key trait influenced by the varieties, particularly flowering time and seed weight, which are critical for selection.

The correlation map (Fig 10). reveals that 1000 seed weight strongly correlates with primary branches and the number of capsules per plant, indicating that varieties with higher seed weight tend to have more branches and capsules. Plant height shows a moderate positive correlation with the number of capsules per plant, suggesting taller plants may produce more capsules. Days to 50% flowering exhibits weak or negative correlations with most traits, indicating it functions as an independent trait. Primary branches positively correlate with capsule production, highlighting their combined role in productivity.

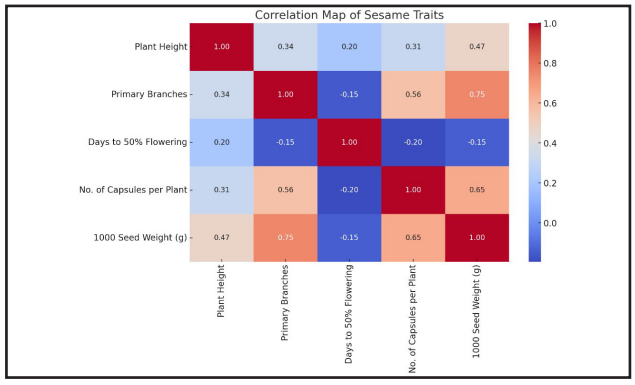


Fig 10. Correlation map Sesame traits

Evaluation of salad type snap melon in Andaman condition during Rabi season

A study was conducted to evaluate the suitability of Snap Melon (*Cucumismelo* ssp. *agrestis*var. *momordica*) for salad consumption under the agro-climatic Islandconditions. The evaluation included 36 melon genotypes, focusing on harvest readiness, fruit characteristics, and palatability. The evaluation was conducted in an Augmented Block Design (ABD) during the January to April growing season, with observations recorded at 35 days after sowing. Key parameters studied included harvest readiness, fruit characteristics, fruit weight at 35 days (Plate 18).Among the 36 melon accessions evaluated, these genotypes performed the best in terms of average salad weight at 35 days of

Plate 18. Fruit harvest at 35 days after sowing

Plate 19. Different growth stages of snap melon for salad purpose

harvest (Plate 19). Genotype PP-13 recorded the highest average salad weight of 268.9 grams,

followed by IC647729 with 260.8 grams and PP-12 with 250.1 grams. Genotype IC647725 showed a promising weight of 245.7 grams, while PP-14 and IC0647737 achieved weights of 240.6 grams and 234.5 grams, respectively. The genotype PP-11, with an average salad weight of 223.4 grams, also performed well compared to the overall accession pool. These top-performing accessions demonstrate their potential for salad production. Snap Melon genotypes IC0647737, IC 0647729, IC 0647725, PP-11, PP-12, PP-13, and PP-14 are well-suited for salad consumption. These genotypes exhibited consistent performance in terms of harvest readiness, fruit weight, and palatability.

Characterization of urd bean and mung bean germplasm

During the Rabi season of 2023-2024, 44 urdbean accessions, including three check varieties (CARI Urd 2, LGG-752, and CO-8), were evaluated under an Augmented Block Design. The average yield of the check varieties was 104.5 grams per plot. Among the test entries, the better-performing lines were BG-41, BG-27, and ANU-11-09, with yields of 153 grams, 136.32 grams, and 125 grams per plot, respectively. These lines exceeded the average yield of the checks, highlighting their superior productivity. The performance indices for the top performers were 1.46, 1.30, and 1.20, respectively, indicating that these lines outperformed the checks by a significant margin and a total of 59 mung accessions, including three check varieties (LGG 5 44, TRAM-1, and CARI Mung-3), were evaluated using an Augmented Block Design. Among the test entries, the top three performing lines were **MG8, MG37**, and **MG11**, with yields of 338 grams, 206 grams, and 185 grams per plot, respectively. These lines outperformed the check varieties, showcasing their superior potential. The top-performing lines, **MG8, MG37,** and**M G11**, achieved performance indices of **3.09, 1.88,** and**1.69**, respectively, indicating they outperformed the average yield of check varieties 109.5 grams significantly. Among these, MG8 demonstrated the highest productivity, exceeding the checks by over three times.

Varietal Improvement

New Rice Plant Lines Developed Through the Multi-Parent Advanced Generation Inter-Cross (MAGIC) Approach

Innovative rice plant lines have been successfully developed using the Multi-Parent Advanced Generation Inter-Cross (MAGIC) approach, resulting in enhanced genetic diversity and superior agricultural traits. The improved plant architecture provides breeders with optimal characteristics that directly enhance the production capacity of specific rice varieties, breaking yield plateaus and boosting overall productivity. A total of six new and improved rice lines have been developed. These lines not only exhibit superior yield-attributing traits but also demonstrate excellent grain yield and improved grain quality (Table 9).

Table 9 Performance of new plant type lines of rice developed through the MAGIC approach

Characters	MG8-4-80-E-47	MG8-4-62-E-39	MG4-2-6-E-15	MG8-4-77-E-45	MG8-4-71-E-43	MG8-4-4-E-18	MG8-4-76-M-40
Plant height (90-100 cm)	110	115	116	122	107	112	136
Thick and sturdy stems	Y	Y	Y	Y	Y	Y	Y
Thick, dark green and erect leaves	Y	Y	Y	Y	Y	Y	Y
Duration (100-130 days)	126	126	132	132	132	132	131
Panicles/m^2 (>330)	284	323	350	264	238	332	288
Speckles/ Panicle (>150)	139	142	164	143	135	127	162
Grain filling (>80%)	79	80	90	85	82	88	81
1000Grain weight (25 mg	28.7	24.1	20.4	27.8	26.5	23.6	19.2
Harvest index (>50%)	47.1	44.7	42.0	45.0	35.5	40.4	38.4
Grain Yield (t/ha)	5560	4836	6466	7583	5114	6269	7027
Grain Type	LS	LS	M	ML	ELS	ELS	MS

Multi-location Trial (MLT) of MAGIC Lines of Rice

A total of 22 MAGIC rice lines were evaluated with three check varieties *viz*., Dweep Dhan 11 (Early duration), Dweep Dhan 7 (Medium duration), and Gayatri (Late duration). The trials were conducted in a Randomized Block Design across three locations during Kharif 2024: Farmers' Field, Keralapuram, North Andaman (L_1); KVK, Nimbudera, Middle Andaman (L_2); and CIARI, Bloomsdale Farm, South Andaman (L_3) . The following observations were recorded plant height (cm), days to 50% flowering, tillers per plant, panicle length (cm), and grain yield (kg/ha). Among the early maturing lines, the significantly highest average grain yield was recorded for MG8-4-77-E-45 (5548.4 kg/ha), while genotypes MG8-4-94-M-43 (5148.6 kg/ha), MG4-2-81-E-19 (4758.2 kg/ha), and MG8-1-2-M-1 (4543.3 kg/ha) showed non-significantly higher yields compared to the early check variety Dweep Dhan 11 (4515.6 kg/ha). In the medium-duration group, none of the lines outperformed the check variety CIARI Dhan 7 (5584.4 kg/ha). However, among the late-maturing varieties, MG4-1-121-M-19 recorded a yield about 10% higher (4103.8 kg/ha) compared to the check variety Gayatri (3697.7 kg/ha) (Table 10). Overall, the performance of early, medium, and late maturing varieties across the Andaman Islands locations indicated that early maturing varieties performed better than medium and late maturing varieties.

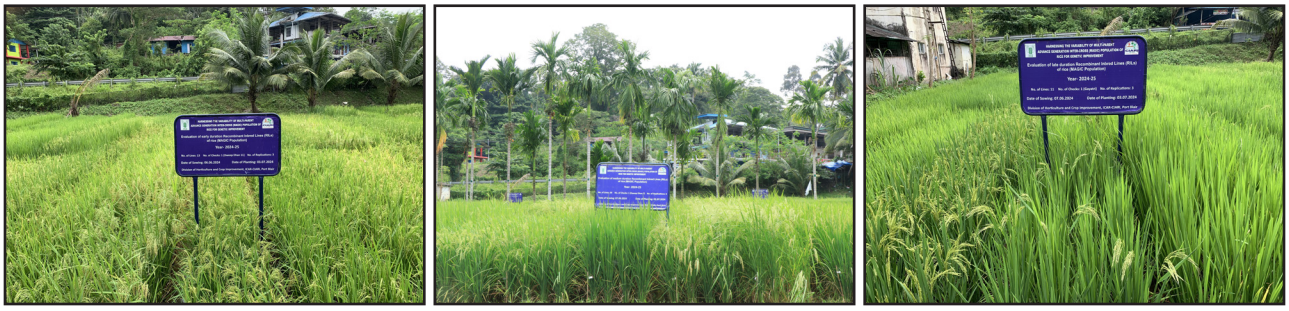
Table 10 Performance metrics of MAGIC lines of rice across locations

Lines	PH	DF	PL	TPP	L1	L2	L3	AY	YA
Dweep Dhan 11 (C)	94.8	86	19.6	9.4	4281.6	4560.8	4704.4	4515.6	**0**
MG8-4-77-E-45	96.2	87	24.9	11.1	5871.6	3190.7	7583	5548.4*	**19**
MG8-1-2-M-1	93.5	87	23.1	8.1	4396.6	3922.7	5310.5	4543.3	**1**
MG4-2-81-E-19	119	76	23.1	7.7	5775.9	4966.2	3532.5	4758.2	**5**
MG8-4-94-M-43	101.5	72	24	8.1	6091.9	4286.8	5067	5148.6	**12**
CIARI Dhan 7 (C)	113.1	92	28.4	9.7	5556.5	4358.1	6838.5	5584.4	**0**
MG8-3-7-E-17	79.7	93	22.1	8.6	4298.8	4027.8	2940.2	3755.6	**-49**
MG8-4-25-E-27	102	93	25.4	10.6	4128.4	2826.6	3904.5	3619.8	**-54**
MG8-4-45-E-35	96.9	93	23.1	7.9	4042.1	2128.4	2903.5	3024.7	**-85**
Gayatri (C)	127.6	109	28.4	10.5	4885.1	2939.2	3268.8	3697.7	**0**
MG4-1-121-M-19	98.8	101	24.4	7.2	5871.6	4039.1	2400.6	4103.8	**10**
Mean	**99.22**	**89.02**	**23.37**	**8.85**	**4728.0**	**3305.6**	**4689.0**	**4240.9**	**-12**
SEd	**5.81**	**6.01**	**1.20**	**1.04**	**400.50**	**285.19**	**389.30**	**358.33**	
CD at 1%	**15.69**	**16.20**	**3.23**	**2.82**	**1080.6**	**769.47**	**1050.4**	**966.81**	
CV	**7.17**	**8.06**	**6.27**	**14.40**	**10.37**	**10.56**	**10.16**	**10.37**	

PH=Plant height (cm), **DF**=Days to flowering (50%), **PL**=Panicle length (cm), **TPP**= Tillers/plant, **AV**= Average grain yield (Kg/ha), **YA**=Yield advantage over the recurrent parent (%), $\mathbf{L_1}$= Farmers field, Keralapuram, North Andaman, $\mathbf{L_2}$=KVK, Nimbudera, Middle Andaman and $\mathbf{L_3}$= CIARI Bloomsdale Farm, South Andaman.

Evaluation of Early, medium and late duration Recombinant Inbred Lines of Rice

During Kharif 2024, 35 early-duration, 22 medium-duration, and 6 late-duration recombinant inbred lines (RILs) were evaluated in the field. Observations were recorded for traits such as flowering time, effective tillers per m², plant height, panicle length, spikelets per panicle, 1000-grain weight, harvest index, grain yield, grain type, and aroma.Among early-duration RILs, 15 lines showed 3-38% higher yields compared to the check variety Dweep Dhan 11. Notable lines such as MG4-2-6-E-15, MG8-4-21-E-25, and MG8-4-4-E-18 produced significantly higher yields, with MG8-4-4-E-18 also exhibiting extra-long slender grains and strong aroma.



a b c

Plate 20. A field view of early, medium and late duration MAGIC Rice Lines during Kharif 2024

Table 11 Performance of early duration recombinant inbred lines of rice.

Lines	DF	TMS	PH	PL	SP	GW	HI	GY	YA	Aroma	GT
CARI Dhan 11 (c)	86	288	108	18	184	19.5	42.7	4704.4	**0**	UST	MS
MG8-4-80-E-47	87	293	111	20	139	28.7	47.1	5560.4	**15**	LST	LS
MG8-4-62-E-39	86	323	115	25	142	24.1	44.7	4836.0	**3**	LST	LS
MG4-2-6-E-15	85	350	116	22	164	20.4	42.0	6466.2*	**27**	ST	M
MG8-4-21-E-25	89	242	118	21	121	21.1	37.0	6553.1*	**28**	ST	M
MG8-4-77-E-45	88	264	122	25	143	27.8	45.0	7583.0*	**38**	LST	ML
MG8-4-71-E-43	88	238	107	24	135	26.5	31.5	5114.2	**8**	LST	ELS
MG8-4-14-M-16	89	231	105	24	120	21.3	33.7	5392.4	**13**	UST	MS
MG8-4-4-E-18	88	332	112	25	127	23.6	40.4	6268.7*	**25**	ST	ELS
MG8-1-2-M-1	88	255	111	24	153	22.6	34.5	5310.5	**11**	UST	MS
MG8-4-10-E-20	85	251	114	24	139	22.4	41.3	5197.2	**9**	ST	LS
MG8-4-76-M-40	88	288	136	20	162	19.2	38.4	7027.1*	**33**	UST	MS
MG8-1-6-E-2	89	233	105	24	142	24.8	37.5	5116.5	**8**	UST	LS
MG8-4-25-E-13	89	330	103	23	129	23.8	36.8	5663.4	**17**	UST	ELS
MG8-4-72-E-44	87	374	155	24	146	22.7	24.1	4909.4	**4**	UST	M
MG8-4-94-M-43	68	394	127	23	142	19.5	26.6	5067.0	**7**	LST	MS
Mean	**86**	**282**	**118**	**24**	**134**	**23.2**	**27.6**	**4410.0**	**-7**	-	-
SEd	1.08	15.2	2.17	0.72	18.0	0.60	2.47	423.65	-	-	-
CD @1%	2.86	40.2	5.74	1.90	47.7	1.59	6.54	1120.9	-	-	-
CV	1.55	6.60	2.25	3.68	16.5	3.17	8.99	11.77	-	-	-

DF=Days to Flowering (50%), **TMS**=Effective tillers/M^2, **PH**=Plant Height (cm), **PL**=Panicle length (cm), **SP**=Spikelet/Panicle, **GW**= 1000 Grain Weight (gm)**, HI**= Harvest Index (%), **GY**=Grain yield (kg/ha), **GT**=Grain Type, **YA**=Yield advantage over the check variety (%), **M**=Medium, **MS**=Medium Slender, **LS**, Long Slender, **ELS=**Extra Long Slender, **UT**=Unscented, **MST**=Mildly Scented **ST**= Scented, CV= Coefficient of Variation, **SD**=Standard Deviation, **CD**=Critical Difference, *= Significant at 1%

For medium-duration RILs, none of the 22 lines outperformed the check variety Dweep Dhan 6 (6202 kg/ha) in grain yield. However, MG4-2-155-E-28 and MG4-2-146-M-40 demonstrated superior harvest indices with satisfactory yields of 5863 kg/ha and 5692 kg/ha, respectively. In late-duration RILs, evaluated alongside the check variety Gayatri, none surpassed the average grain yield of 2445.5 kg/ha due to bird infestations. Among these, MG4-2-139-M-37 exhibited long-slender grains, while MG4-1-127-L-1 and MG4-2-139-M-37 were slightly aromatic

Evaluation of recombinant inbred lines (RILs), for submergence tolerance

A total of 64 recombinant inbred lines (RILs) were evaluated for submergence tolerance during Kharif 2024. These lines were assessed with the check varieties *Swarna Sub1* (submergence-tolerant) and *Swarna* (submergence-susceptible). The experiment was conducted using an Augmented Block Design, where each genotype was planted in a single row containing 15 plants. After 45 days of planting, the field was completely submerged for 10 days, with water levels maintained at

90–110 cm throughout the submergence period. Observations were recorded for traits such as plant survival percentage, days to 50% flowering, days to maturity, plant height (cm), panicle length (cm), effective tillers per plant, and grain yield per plot (g). *Swarna Sub1* demonstrated a 100% survival rate compared to 64% for *Swarna*. Notably, 26 RILs also exhibited a 100% survival rate under submergence conditions. Flowering was delayed by approximately 35 days (50% flowering) compared to normal field conditions. Among the 64 lines, four genotypes-MG8-4-4-E-18, MG8-4-76-M-40, MG4-1-126-M-9, and MG4-2-146-M-40 displayed a high level of tolerance to submergence, with 100% survival and superior grain yield compared to both check varieties, *Swarna Sub1* and *Swarna*.

a b c

Plate 21. Screening of rice RIL lines for submergence tolerance under field condition a. Pre-flowering stage before submergence; b. Complete submergence; c. ten days after submergence.

Table 12: Performance of rice recombinant inbred lines for submergence tolerance in field conditions during Kharif 2024.

Genotypes	SP	DF	DM	PH	PL	TP	GY
Swarna	64	134	159	109.2	24.4	6.8	37.22
Swarna sub-1	100	126	151	101.4	22.2	9.4	20.19
MG8-4-4-E-18	100	140	165	110.4	25	9.4	82.40
MG8-4-76-M-40	92	126	151	107.2	21.8	9.4	50.47
MG4-1-126-M-9	100	125	150	120.4	21.2	7.4	70.35
MG4-2-146-M-40	100	122	147	95.4	21.8	6.4	95.81

SP= Survival percent, **DF**=Days to Flowering (50%), DM= Days to maturity, **PH**=Plant Height (cm), **PL**=Panicle length (cm), **TP**=Tillers per plant and GY=Grain yield per plot (g)

Regional Station, Minicoy

The Regional Station at Minicoy, Union Territory of Lakshadweep, was established in 1976 as a vital research facility under the auspices of the Indian Council of Agricultural Research (ICAR) in New Delhi. In a strategic move to bolster agricultural research in island zones, this station was integrated into the Central Island Agricultural Research Institute (CIARI) based in Port Blair (now known as Sri Vijaya Puram) Andaman and Nicobar Islands, and as of April 1, 2017, the station functions under the Central Island Agricultural Research Institute (ICAR-CIARI), marking a significant phase in its evolutionary trajectory. Located approximately 400 kilometers from Kochi and west of Vizhinjam Port in Thiruvananthapuram, Minicoy—known as Maliku locally—is the second-largest island in Lakshadweep. The inhabitants of Minicoy, distinct in their linguistic and cultural expressions, communicate primarily in 'Mahal,' a dialect of Dhivehi, underscoring their ties to Maldivian heritage. The local economy is primarily anchored in marine fishing and agriculture, with tuna pole and line fishing, alongside the production of 'Masmin'—a smoke-dried fish product—being pivotal activities. Additionally, value-added products like 'Rihakuru' (fish jaggery) and coconut-derived goods such as coconut vinegar and jaggery play a significant role in sustaining these cottage industries, reflecting the island's innovative adaptation to resource utilization. The ICAR-CIARI Regional Station is strategically situated at South Bandaram, merely 1.5 kilometers from the main passenger jetty, encompassing an experimental farm, a field laboratory, and residential quarters across a total land area of 6.062 hectares. The region's soil predominantly consists of coral sandy types with an alkaline pH ranging from 7.0 to 8.6, while the climatic conditions are characterized by an average annual rainfall of 1613 mm, complemented by a mean annual temperature of 27.9 degrees Celsius, creating a unique environment for agricultural research and sustainable livelihood practices. Low-lying islands like Minicoy and others in the Lakshadweep archipelago are increasingly significant owing to their susceptibility to climate change phenomena, including rising sea levels and various natural hazards. In response to these challenges, the scientific team of Regional Station, Minicoy has implemented climate-resilient farming practices such as integrated farming systems and the use of fish aggregating devices in the year 2024, which have successfully captured the interest of the local tribal communities. The regional research station is committed to addressing the needs of these populations by promoting sustainable production methodologies across agriculture, livestock, and fisheries sectors. Through these initiatives, there is a concerted effort to enhance the resilience of local economies and preserve the unique biodiversity of the islands while ensuring food security for future generations.

Scheduled Tribe Component

(i) Capacity building programmes

S. No	Title	Venue & Date	No. of participants			Coordinators
			M	F	T	
1	Awareness program on marine turtle monitoring through citizen science	KVK, Car Nicobar 22/01/2024 to 24/01/2024	25	0	25	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
2	Training on Improved Organic farming Practices for Island Based Cropping system and Input Distribution under Institute STC and AICRP-TC STC	Chotta Enaka, Kakana, Pilpillow and Chowra Islands of Nancowrie group of Islands 28/01/2024 to 31/01/2024	148	63	211	I. Jaisankar T. Subramani
3	Dry Weather Management in Vegetables, Plantation crops and Livestocks, Under Gramin Krishi Mousam Sewa	Kamorta 01/02/2024	23	17	40	I. Jaisankar T. Subramani Abhilash
4	Quality Seed and Planting Material in Agri-horticultural Crops	ICAR-CIARI, Sri Vijaya Puram 07/02/2024 to 09/02/2024	7	4	11	P.K. Singh Ajit A. Waman Pooja Bohra
5	Training on integrated farming and input distribution	RS Minicoy 19/02/2024 to 24/02/2024	48	33	81	Ajina S.M. Gladston Y. Abdul Gafoor Arif M.I.
6	Training on Responsible fisheries and input distribution	RS Minicoy 22/02/2024 to 24/02/2024	48	35	83	

S. No	Title	Venue & Date	No. of participants			Coordinators
			M	F	T	
7	Awareness Programme on Freshwater ornamental fish and workshop on ICT Tools for Marine Resource Management for Nicobari youths.	ICAR-CIARI Sri Vijaya Puram 24/02/2024	14	20	34	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
8	Awareness Programme on Fisheries technologies for enhancing income of tribal for better livelihood	Pillpillow, Kamorta 08/03/2024	25	0	25	S.K. Zamir Ahmed D Karunakaran
9		Campbell Bay 09 cluster of villages namely Makhachua, Pilopanja, Afra Bay, Pilobha, Pilomillow, Pulolo, Pilobhabhi, Rajiv Nagar –II & Kondul 06/03/2024	50	0	50	S.K. Zamir Ahmed D Karunakaran and D. Xavier, AF&O, Dept. of Fisheries
10	Livestock and poultry-based entrepreneurship development	Livestock farm complex, ICAR-CIARI, Sri Vijaya Puram 13/03/2024	16	-	16	T. Sujatha
11	Scientific Tuber crops cultivation and Input Distribution under AICRP-TC	ICAR-KVK South Andaman 24/03/2024	16	-	16	I. Jaisankar T. Subramani Y. Ramakrishna Santosh Kumar
12	Training Programme on milking a cow	RS Minicoy 22/06/2024	8	0	8	Ajina S.M. Gladston Y. Abdul Gafoor Arif M.I. S. Hassan

S. No	Title	Venue & Date	No. of participants			Coordinators
			M	F	T	
13	Awareness Program on Marine Fauna, Citizen Science Initiatives and Demonstration on NICMIS Android App	Car Nicobar 19/07/2024	20	0	20	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
14	Demonstration on NICMIS Android App, Sea Safety Gears and Integration of Citizen Science Initiatives	Big Lapathy & Malacca Schools 22/07/2024	11	21	32	
15	Field Induction Programs on Coastal Biodiversity, Identification, and Threats Management	Big Lapathy & Malacca Schools 24/07/2024	11	21	32	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
16	Scientific cultivation of paddy	Rajiv Nagar, Campbell Bay, Great Nicobar 26/07/2024	33	14	47	P.K. Singh Prabhu P. K.S.Sunder Rao
17	Awareness Program on Marine Fauna, Citizen Science Initiatives	Big Lapathy & Malacca Schools 24/07/2024	61	76	137	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
18	Application and importance of biocontrol agents for organic vegetable cultivation	Chingam Basti,Campbell Bay, Great Nicobar 27/07/2024	17	17	34	P.K. Singh Prabhu P. K.S.Sunder Rao
19	Sensitization programme on livelihood augmentation through diversification of fishing technologies & Input Distribution	RS Minicoy 29/07/2024 to 31/07/2024	22	1	23	Ajina S.M. Gladston Y. Abdul Gafoor Arif M.I. S. Hassan
20	Awareness programme on Organic Farming and Input Distribution	RS Minicoy 27/09/2024	23	10	33	Ajina S.M. Gladston Y. Abdul Gafoor Arif M.I. S. Hassan

S. No	Title	Venue & Date	No. of participants			Coordinators
			M	F	T	
21	Advanced farming practices in livestock and poultry	RS Minicoy 13/11/2024	20	-	20	Gladson Y. Ajina S.M. T. Sujatha
22	Awareness training on best management practice in livestock		18	2	20	Sujatha T. Ajina S.M. Gladston Y. Abdul Gafoor Arif M.I. S. Hassan
23	Enhancing Nutritional Security through Vegetable Production in Kitchen Gardens	Harminder Bay 24/11/2024 to 26/11/2024	60	44	104	Talaviya H. T. Subramani
24	3-days Training Programme on "Scientific interventions on livestock farming for livelihood security of Tribal farmers" from		45	60	105	A.K. De
25	Scientific tuber crops cultivation for higher productivity and Input Distribution under AICRP-TC-STC program	ChotaEnaka, Kakana, Pilpillow and Vikas Nagar villages 24/11/2024 to 26/11/2024	66	87	153	I. Jaisankar T. Subramani
26	Training programme on Scientific Poultry Management	Harminder Bay 30/11/24 to 02/12/24	57	43	100	K. Muniswam T. Sujatha P. Perumal R.R. Alyethodi A.K. De P.A. Bala Jai Sunder
27	Scientific tuber crops cultivation and its value addition	Nancowrie group of Islands 05/12/2024 to 07/12/2024	102	57	159	I. Jaisankar T. Subramani

S. No	Title	Venue & Date	No. of participants			Coordinators
			M	F	T	
28	Scientific tuber crops cultivation and its value addition	Chota Enaka, Kakana, Pillpilow and Hitui villages of Nancowry islands 05/12/2024 to 09/12/2024	87	72	159	Arun Kr. De P. Perumal
29	Training and capacity building on "Scientific livestock farming" on	Kamorta 28/02/2024	35	40	75	A.K. De
30	Training and capacity building on "Scientific livestock farming" on	Chota Enaka 29/02/2024	20	25	45	
31	Training and capacity building on "Scientific livestock farming" on 01.03.2024	Pilpillo 01/03/2024	30	35	65	

Male-1306 Female-741 Total-1783

(ii) Distribution of planting materials/ seed

S.No	Particulars	Qty	Venue	No. of benficiaries			Coordianators
				M	F	T	
1	Coconut seedlings (Chavakkad orange dwarf, Green Dwarf and Gangabondam)	42	RS Minicoy	12	2	14	Gladston Y. Ajina S.M.
2	Hybrid Napier (CO 5) Fodder grass	500	Minicoy, Kavaratti, Kadmat and Amini Islands	5	2	7	
3	Vegetable seedlings (Chilly, Brinjal, Tomato, Pumpkin, Cowpea, Cucumber, Cabbage, Ash gourd, Bottle Gourd)	1119	RS Minicoy	165	143	308	

S.No	Particulars	Qty	Venue	No. of benficiaries			Coordianators
				M	F	T	
4	Ornamental plants (Marigold, cosmos, Bougainvillea, Chinese balsam, Coleus, Portulaca)	200	RS Minicoy	48	26	74	
5	Medicinal plants (Tulsi, Aloe vera)	10		1	1	2	
6	Vegetable seeds (Amaranthus and Chilli)	Amarantus - 700 gm Chilly - 500 gm	Kavaratti, Kadmat and Amini Islands	5	15	20	Gladston Y. Ajina S.M.
7	Rooted cuttings of west Indian cherry	252	Perka and Mus villages (Car Nicobar)	108	46	154	Pooja Bohra Ajit Arun Waman Santosh Kumar
8	Passion fruit seedlings	600					
9	Seedlings of acid lime	600					
10	Seedlings of blood fruit	7					
11	Seedlings of papaya	175					
12	Rooted cuttings of black pepper	200					
13	Clove seedlings	300					
14	Long pepper rooted cuttings	500					
15	Lemon grass in polybag	600					
16	Sweet potato potato cuttings	450 nos.	ChotaEnaka, Kakana, Pilpillow and Vikas Nagar villages	66	87	153	I. Jaisankar T. Subramani
17	Tapioca setts	350 nos.					
18	Dweep micro bioconsortia	200kg					
19	Vegetable seed kit for Kitchen-garden	40	Harminder Bay	0	40	40	Talaviya H.

S.No	Particulars	Qty	Venue	No. of benficiaries			Coordianators
				M	F	T	
20	Paddy seeds	200 kg paddy seeds	Chingam Village, Campbell Bay, Great Nicobar	14	20	34	P.K. Singh Prabhu P. K.S.Sunder Rao
21	Vegetable Kit	60	Rajiv Nagar, Campbell Bay, Great Nicobar	33	14	47	
22	Paddy seeds	600 kg	Rajiv Nagar, Campbell Bay, Great Nicobar	33	14	47	

Male-259 Female-236 Total-495

(iii) Distribution of other inputs

S. No.	Particulars	Qty.	Venue	Number of beneficiaries			Coordinators
				M	F	T	
1	Poultry feed	2.0 tons	Harminder bay	10	10	20	T. Sujatha A.K. De
2	Ayurvedic liver tonic	25 nos		15	10	25	
3	Herbal immune booster	20 nos		10	10	20	
4	Sulpha powder	20 nos		10	10	20	
5	Piperazine	30 nos		20	10	30	
6	Bactericide	20 nos		10	10	20	
7	Poultry feed	7.0 tons		25	25	50	K. Munisamy T. Sujatha
8	Pig feed	5.0 tons	Car Nicobar	42	23	65	A.K. De
9	Chelated Minerals fortified with herbs and active live yeast (5 kg / packet)	66 packets	Harminder Bay	45	60	105	
10	Calcium and phosphorus tonic (5 litre can)	100 cans		45	60	105	

S. No.	Particulars	Qty.	Venue	Number of beneficiaries			Coordinators
				M	F	T	
11	Himax (50 grams/ tube)	400 tubes	Harminder Bay	45	60	105	A.K. De
12	Pig feed	6 tonnes		57	43	100	K. Munisamy
13	Poultry feed	7 tonnes		57	43	100	
14	Mineral mixture (20kg/pack)	13 nos		57	43	100	
15	Table Salt (1kg/ pack)	90 pkt		57	43	100	
16	Groviplex solution (5 lts/ bottle)	19 Nos		57	43	100	
17	Vimeral solution (500ml/bottle)	50 Nos		57	43	100	
18	Addon Poultry Max (1kg/pack)	06 Nos		57	43	100	
19	Minprop XP growth promoter (1 lt/bottle)	20 n0s		57	43	100	
20	Venlyte powder (poultry) (1 kg/ pack)	25 Nos		57	43	100	
21	Amprolium soluble powder (150g/pack)	25 Nos		57	43	100	
22	Lixen powder (Cephalexin) (1 box,10 sachet, 20gm/sachet)	3 box		57	43	100	
23	Neodox forte (50g/pack)	30 Nos		57	43	100	
24	Tylosin tartrate powder (trox), (120g/bottle)	15 Nos		57	43	100	
25	Povidone ointment (25gm/ tube)	70 Nos		57	43	100	
26	Tarpaulin sheet (12ft × 15ft)	50 Nos		57	43	100	

S. No.	Particulars	Qty.	Venue	Number of beneficiaries			Coordinators
				M	F	T	
27	lce Box Head Torch Light Safety Jacket	25 nos. 25 nos. 50 nos.	Campbell Bay	50	0	50	D. Karunakaran
28	lce Box Head Torch Light Safety Jacket	25 nos. 25 nos. 50 nos.	Pillpillow Kamorta	50	0	50	
29	Fruit fly traps	750 nos.	Kavaratti, Kadmat and Amini Islands	48	33	81	Gladston Y. Ajina S.M.
30	Cast net	2 nos.	Kavaratti Islands	2	0	2	
31	Pesticide	Verticillium- 10 Kg Beauveria - 10 kg Psuedomanas - 10 kg Trichoderma - 10 kg	Minicoy, Kavaratti, Kadmat and Amini Islands	58	42	100	
32	Micronutrients	Micronutrients mix- 200 kg	Minicoy, Kavaratti, Kadmat and Amini Islands	58	42	100	
33	Snorkel and Mask	65 nos.	Fishermen of Car Nicobar	65	-	65	R. Kiruba Sankar
34	Fishing rod and accessories	15 nos. 10 nos.	Fishermen of Car Nicobar Fishermen of Little Andaman	15 10	-	15 10	K. Sarvanan
35	FRP fishing boats	2 nos.	Fishermen from Big Lapathy and Chukchucha	30	-	30	R. Kiruba Sankar
36	25hp Outboard engine	2 nos.	Fishermen from Big Lapathy and Chukchucha	2	-	2	

S. No.	Particulars	Qty.	Venue	Number of beneficiaries			Coordinators
				M	F	T	
37	Coconut climber	70 nos.	ChotaEnaka, Kakana, Pilpillow and Vikas Nagar villages Car Nicobar	66	87	153	I. Jaisankar T. Subramani
38	Spade	20 nos.					
39	Spade with handle	20 nos.		16	-	16	I. Jaisankar T. Subramani Y. Ramakrishna Santosh Kumar
40	Hand hoe	50 nos.					I. Jaisankar T. Subramani
41	Hand cultivator	14 nos.					
42	All 19 Water soluble fertilizer	72 kg					
43	Bio consortia	100 kg	Chingam Village, Campbell Bay, Great Nicobar	14	20	34	P K. Singh Prabhu P. K.S. Sunder Rao
44	Trichoderma	100 kg	Rajiv Nagar, Campbell Bay, Great Nicobar	33	14	47	
45	Azadirachtin 0.03%	10 lit	Rajiv Nagar, Campbell Bay, Great Nicobar	33	14	47	

Male-2071 Female-1621 Total-3692

(iv) Demonstration of technology

S. No	Technology	Venue	Number of participants			Coordinators
			M	F	T	
1	Demonstration 'Iron supplementation for control of IDA in piglets' on 29/02/2024	Chota Enaka	20	25	45	A.K. De
2	Demonstration on 'Probiotics supplementation in pigs" on 01/03/2024	Pilpillo	30	35	65	Dr. A.K. De

S. No	Technology	Venue	Number of participants			Coordinators
			M	F	T	
2	Demonstration on 'Probiotics supplementation for combating weaning stress' in piglets	Tamaloo, Small Lapathy, Big Lapathy and Kinyuka 23/08/2024	18	7	25	A.K. De
02	Demonstration 'Iron supplementation for control of IDA in piglets'	Perka, Tapoiming, and Arong village of Car Nicobar 24/08/2024	11	13	24	
3	Feed milling technology on Balanced poultry feed using residue of masmin preparation	RS Minicoy 11/11/2024	4	2	6	T. Sujatha Gladson Y. Ajina S.M.
4	Demonstration 'Iron supplementation for control of IDA in piglets'	Harminder Bay 25/11/2024	45	60	105	A.K. De
5	Demonstration "Mineral supplementation in livestock"	Harbinder Bay 26/11/2024	45	60	105	
6	Vaccination in Poultry and its importance	Harminder Bay 3/12/2024	57	43	100	K. Muniswamy T. Sujatha P Perumal R.R. Alyethodi A.K. De P.A. Bala Jai Sunder
7	Vaccination in Poultry	Harminder Bay	57	43	100	K. Munisamy
8	Demonstration on pheromone traps (3 in farmers field)	Kavaratti, Kadmat and Amini Islands	48	33	81	Gladson Y. Ajina S.M.
9	Demonstration IFS system	RS Minicoy	25	10	35	
10	Demonstration on NICMIS Android App (Students)	Big Lapathy & Malacca Schools	97	92	189	R. Kiruba Sankar
11	Induction Program on Sea Safety Gears (Students)	Big Lapathy & Malacca Schools	97	92	189	
12	Demonstration cum input distribution to promote small-scale fishing activities of tribal fishers	Harminder Bay	3	7	10	K. Sarvanan

Male-507 Female-462 Total-969

(v) Kitchen garden/ demonstration block/ nursery development

S. No.	Particulars	Venue	Coordinators
1	Kitchen garden	G H S S Minicoy	Gladson Y. Ajina S.M.
2	IFS demonstration cum kitchen garden	RS Minicoy	
03	Nursery development		
04	Demonstration block (Tube rose, Fodder, Pumpkin and Cherry tomatoes))		Gladson Y. Ajina S.M.

(vi) Exposure visit for tribal farmers

S. No.	Exposure visit with target group	Venue	Number of participants			Coordinators
			M	F	T	
1	Nicobari tribal farming community	Livestock farm complex ICAR-CIARI Sri Vijaya Puram 21/02/2024	16	-	16	T. Sujatha
2	Visits of tribal farmers of Minicoy islands to the IFS demonstration unit of ICAR-CIARI	RS Minicoy	72	31	103	Gladson Y. Ajina S.M.
3	Visits of tribal farmers of Minicoy Islands Demonstration unit of scientific goat and poultry farming		13	7	20	
4	Exposure visit for the Nicobarese (Tribal farmers of Little Andaman Island)	ICAR-CIARI Sri Vijaya Puram 07/02/2024 to 09/02/2024	7	4	11	P.K. Singh Ajit Arun Waman Pooja Bohra
5	Exposure visit for the studnets to Coastal fisheries information hub	Big Lapathy & Malacca Schools 05/08/2024 to 06/08/2024	61	76	137	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran

Women Participation (SC/ST)

Sl no	Sector	Number of women farmers beneficiaries
1	Animal Science	555
2	Horticulture & Forestry	725
3	Natural Resource Managment	223
4	Field Crops	127
5	Fisheries	273

Technologies Developed/ Transferred/ Demonstrated

7.1 Technology Developed

NICMIS (Nicobar Coastal Management Information System) - A android application developed for citizen science initiatives in Car Nicobar Island

NICMIS (Nicobar Coastal Management Information System) an Android mobile application was conceptualized and developed to implement marine conservation projects using ICT Tools in Car Nicobar. This innovative tool aims to engage citizens in scientific data collection as part of their everyday lives, recreational pursuits, community initiatives, or educational programs. Considering the fragile marine resources of Car Nicobar- sea turtle tracking, marine mammal monitoring, coral reef monitoring, tracing the poachers, and tide line marking were envisaged and accordingly, a mobile application was developed. NICMIS facilitates real-time data collection for various marine conservation projects, fostering a collaborative approach to protecting Car Nicobar's precious marine resources. It has predefined forms thatallow registered users to submit critical information regarding marine conservation issues and options.

Developers: Dr. R. Kiruba Sankar, Shri. D. Karunakaran, Smt. Jessica Barman, Dr. K. Saravanan, Dr. J. Praveenraj, Smt. Sonia and Mr. Vinay Raj.

Polyherbal acaricide

This technology is an herbal and aqueous based formulation witha total of six herbal plants such as Turmeric (*Curcuma longa*), Vasambhu (*Acarus calamus*), Pepper (*Piper nigrum*), Tulsi (*Ocimum sanctum*), Acalypha (*Acalypha indica*) and Lucas (*Lucas aspera*). This polyherbal acaricide has been standardized with efficiency booster and better stability at room temperature preservation. Based on its *in vitro* assay *i.e*. larval packet test (LPT), aqueous extract of polyherbal combination exhibited 100% acaricidal efficacy and 100 % larvicidal activity. By Larval Tarsal Test, this was found that, there was 100 per cent ovicidal effect shown by the polyherbal combination.

Developers: Dr. T. Sujatha, Dr. D.Bhattacharya, Dr. A.K. De, Dr. Jai Sunder, Dr. P.Perumal and Dr. SharathYeligar

ICAR-CIARI Agrometeorological Observatory Database: Advancing Meteorological Data Management

The ICAR-CIARI Agrometeorological Observatory Database is a state-of-the-art digital platform designed to streamline the collection, storage, and analysis of meteorological data in the Andaman and Nicobar Islands. Developed by the Division of Natural Resources Management, ICAR-CIARI, this initiative marks a significant step in modernizing agro-meteorological data management, enhancing its accessibility and utility for scientific and practical applications. The observatory, located at the Garacharma Campus, is equipped with seven key instruments, including a USWB Open Pan Evaporimeter, Wind Vane, and Stevenson's Screen. These devices

record critical parameters such as evaporation, wind speed and direction, rainfall, temperature, and soil temperature. Previously, data from these instruments were manually logged, limiting its reach and usability. The new database addresses these challenges by digitizing the records and making them available on an interactive web-based platform.

Key features of the database include 24/7 access for scientists with institutional credentials, customizable time scales for data visualization, and multiple data representation options, such as graphical and tabular formats. The platform also supports the download of data in widely used formats like CSV and Excel, enabling external analysis. Users can explore parameter-specific dashboards and aggregate data over monthly or annual scales to study both short-term variations and long-term trends.

In addition to its primary focus on supporting ICAR-CIARI scientists, the platform offers partial public access, ensuring that farmers, policymakers, and researchers can leverage reliable meteorological insights for agricultural planning and climate resilience. Rainfall data, for instance, is categorized into IMD-specified classes, providing a clear understanding of distribution patterns and frequency of events.

This innovative system is hosted on a Linux-based server, ensuring robust and secure access. By digitizing meteorological records, the database serves as a critical resource for advancing agricultural research, supporting decision-making, and promoting data-driven strategies in the unique island ecosystem. The ICAR-CIARI Agro-meteorological Observatory Database exemplifies the fusion of technology and science, offering a reliable, user-friendly tool to address the growing need for precise, accessible meteorological data in a rapidly changing climate.

Developer :Dr. Abhilash

7.2 Technology Certified by ICAR

Dweep Carp Grower Feed

Dweep - Carp Grower Feed has been formulated with 22-28% crude protein and 4-6% crude lipid content using locally available feed ingredients. It is suitable for feeding Indian Major Carps from the fingerling stage to marketable size. This technology has been licensed to M/s. Meyor Nature, Garacharma, South Andaman, and was developed by Dr. K. Saravanan, Dr. T. Sivaramakrishnan, Dr. R. Kiruba Sankar, Dr. J. Praveenraj, and Dr. Sreepriya Prakasan.

Plate 22. Dweep Carp Grower Feed

Protocol of 2-7-10-15 module of oral iron supplementation for control of iron deficiencyanaemia (IDA) in piglets.

The technology describes a novel oral iron supplementation regimen to control iron deficiency anaemia (IDA) in piglets. Iron supplementation is administered orally on the 2nd, 7th, 10th, and 15th days post-birth at a dosage of 30 mg/kg body weight. Oral iron supplementation in piglets reduces mortality rates by 10%, increases body weight at weaning by 5-8%, and

improves hemoglobin levels, serum iron, serum ferritin levels, and organ (liver and spleen) iron levels. The technology has been tested on farmers' fields and found to be highly effective in controlling IDA in piglets. This technology has been developed by Dr. Arun Kumar De, Dr. Perumal Ponraj, Dr. T. Sujatha, Dr. Jai Sunder, and Dr. Debasis Bhattacharya.

Plate 23. IDA in piglets

7.3 Technology Commercialized

Dweep Tickure

ICAR-Central Island Agricultural Research Institute (ICAR-CIARI), Sri Vijaya Puram, signed a Memorandum of Understanding (MoU) on December 17, 2024, for licensing DweepTickure—a herbal acaricide formulation developed for the control of ticks in livestock. The agreement was signed by Dr. E.B. Chakurkar, Director of ICAR-CIARI, and Smti. M.K. Kamala, CEO of Panchajanya Enterprises, Bengaluru, at ICAR-CIARI, Sri Vijaya Puram.A team comprising Dr. T. Sujatha, Dr. Jai Sunder, Dr. D. Bhattacharya, Dr. E.B. Chakurkar, and Dr. A.K. De developed the formulation. DweepTickure is an eco-friendly, non-toxic herbal product designed to treat tick infestations in livestock. The formulation includes herbal extracts in herbal oil, which effectively kills ticks and repels flies from domestic animals. This patented technology has significant potential as part of an Integrated Pest Management (IPM) strategy, offering sustainable benefits for improving the health of cattle and goats.

Plate 24. Commercialization of Dweep Tickure

Sex Determination Kit for Non Ratite Birds

ICAR-Central Island Agricultural Research Institute (ICAR-CIARI), Sri Vijaya Puram, signed a Memorandum of Understanding (MoU) on July 11, 2024, for licensing 'Sex Determination Kit for Non Ratite Birds'-an easy and accurate method of determining the gender of non-ratite birds. The agreement was signed by Dr. E.B. Chakurkar, Director of ICAR-CIARI, and Shri Raja Majumdar, Managing Director, GCC Biotech India Pvt. Ltd., Kolkata, at ICAR-CIARI, Sri Vijaya Puram. A team comprising of Dr. Arun Kumar De, Dr. Debasis Bhattacharya, Dr. T. Sujatha, Perumal P, Dr. Jai Sunder, Dr. A. Kundu, Dr. S. K. Zamir Ahmed and Dr. E. B. Chakurkar developed the technology. The technology is a molecular method of sex determination of any non-ratite birds with 100% sensitivity and specificity. The technology can be applied for sex determination of any colored birds where manual determination is very erroneous. Sex can be determined at day-old stage for poultry chicks. Moreover, the method

is non-invasive as feather samples are required as biological material. Most interestingly, DNA Isolation step is not required in this technology. The kit may used for academic purposes as well as by poultry breeders.

Plate 25. Sex Determination Kit for Non Ratite Birds

7.4 Patents granted

An acaricide formulation for the control of ticks in farm animals

ICAR-Central Island Agricultural Research Institute has been granted a patent for an invention entitledv "an acaricide formulation for the control of ticks in farm animals" (Patent no 541298 dated 10th June, 2024. The invention involves the preparation of an unique acaricide formulation for the control of ticks in farm animals. The main advantage of the formulation is that only one single active chemical ingredient in minute concentrations has been used; which is eco-friendly. The preparation has larvicidal and adulticide properties in animals, do not pick up infection up to 180 days post treatment even if after exposure to infective stage and egg hatchability of adult female engorged tick was 0%. his technology was invented by team of scientists comprising Dr. T. Sujatha, Dr. D. Bhattacharya, Dr. Arun Kumar De, Dr. P. Perumal Dr. Jai Sunder and Dr.E.B.Chakurkar.

A new and safe method of blood collection from farm pigs

Patent has been granted for an invention entitled 'a new and safe method of blood collection from farm pigs' (Patent No. 544874, Date of grant: 12/07/2024). The present invention describes an innovative technique of blood collection in which blood is collected from a different anatomical site of farm pigs which has not been described earlier in patented and non-patented literature. The present invention does not require any premedication prior to the collection of blood and at least 20-30 ml of bloodcan be collected at a time from an animalThis technique is applicable to pigs of any age group and blood can be collected multiple times a day. In the present investigation, blood can be collected without any discomfort to the animals, does not require any special care after collection of blood and animals can be returned immediately to their respective pens. Thus, the novel method of blood collection will be helpful for research purpose. This technology was invented by team of scientists comprising of Dr. Arun Kumar De, Dr.Perumal P., Dr. Jai Sunder, Dr. T. Sujatha, Dr. D. Bhattacharya, Dr. P.A. Bala and Dr. E.B. Chakurkar

7.5 Industrial design granted

Cinnamon bark rubbing tool

It is a handy tool that facilitates extraction of inner bark of cinnamon from the harvested stems. Cinnamon is an ancient spice and country imports huge quantities of produce causing loss to the national exchequer. High labour requirement in various stages of harvesting is the main factor deterring cinnamon cultivation in the country. In order to facilitate the harvesting, availability of user-friendly tools is required and this invention is a timely attempt to meet this gap.

Inventors : Dr. Ajit Arun Waman and Dr. Pooja Bohra.

Closed water circulatory system

It is a laboratory aid useful for condensation operation during the process of extraction of phytochemicals from spices, medicinal&aromatic plants, fruits etc. Such extraction processes involve continuous use of running tap water for condensation, which results in considerable wastage of water; while the sophisticated recirculatory chillers are too costly for most of the small laboratories. Thus, the invention would not be only affordable but also water-saving solution for the researchers and academicians dealing with various aspects such as extraction of essential oils, fixed oils, refluxing of samples etc.

Inventors: Dr. Ajit Arun Waman and Dr. Pooja Bohra.

7.6 Farmers varieties registered

Chinta Mango" farmers variety registered in PPVFRA

ICAR-CIARI, Port Blair facilitated Shri Chintaharan Biswas, a progressive mango farmer having more than 100 mango trees from Shaheed Dweep, to register his farmer variety with the name as "Chinta Mango" in the Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA), New Delhi. This is the first mango variety from this island to be registered in the PPVFRA and will be known as Chinta Mango. "Chinta Mango" belongs to the species *Mangifera indica*, a cultivated mango species. The special feature of this genotype is the characteristic purple color in the peel at the unripened stage. ICAR-CIARI has made efforts for the morphological and biochemical characterization of this genotype. Fruits are large in size, and the individual fruit weight ranges from 300-400g. The fruits are delicious with yellow pulp, sweet with less fibre content and the average TSS recorded is 19.6°B. Another unique feature of this genotype is the occurrence of polyembryonic seedlings. This is an additional

Plate 26. ICAR-CIARI registers 'Chinta Mango,' Shaheed Dweep's first mango variety, with PPVFRA

advantage of this mango as the purity of the genotype can be maintained by seed propagation. The phytochemical characterization of fruit pulp showed its richness in carotenoids, flavonoids, ascorbic acid, and antioxidant activity.

7.7 Coconut varieties notified by Govt of India

A dwarf tender nut variety Dweep Haritha with green coloured fruits and a dwarf tender nut variety Dweep Sona with yellow coloured fruits for cultivation in Andaman and Nicobar Islands has been notified for Seed production for the purposes under the Seeds Act, 1966 (54 of 1966) in the Official Gazette, CG-DL-E-14112024-258647, Dt. 13.11.2024, Ministry of Agriculture and Farmers Welfare (Department of Agriculture and Farmers Welfare), Government of India.

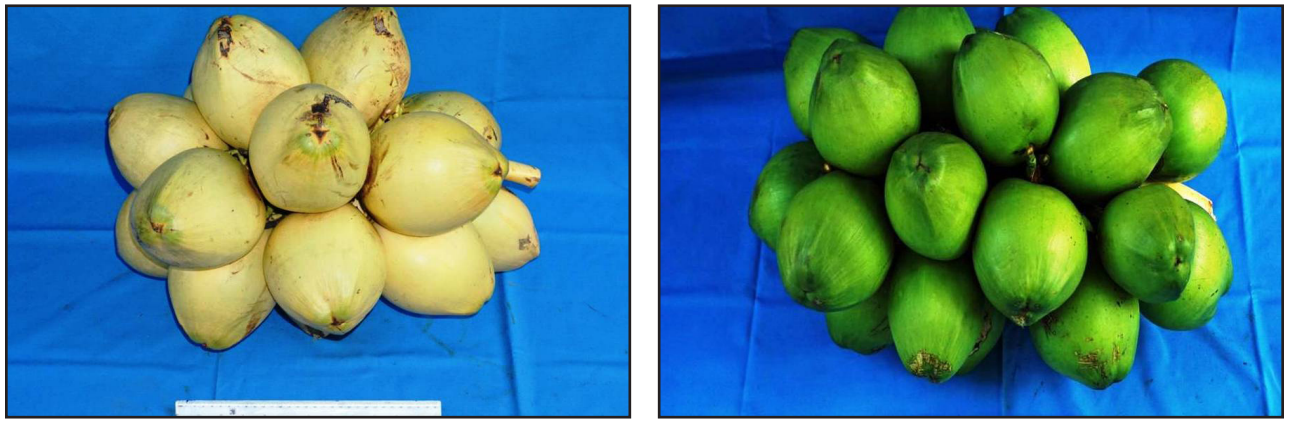


Plate 27. Dweep Haritha and Dweep Sona varieties notified for seed production

7.8 Technology demonstration

Sl. No	Name of tecnology	Venue	Particpants			Coordinators
			M	F	T	
1	Training program on freshwater ornamental fish culture for entrepreneurship development	ICAR-CIARI	8	12	29	J. Praveenraj K. Saravanan R. Kiruba Sankar
2	Training on freshwater ornamental fish culture for entrepreneurship development among Nicobarese youth	ICAR-CIARI	29	20	49	

Sl. No	Name of tecnology	Venue	Particpants			Coordinators
			M	F	T	
3	Demonstration of coconut based Integrated farming system	RS Minicoy	10	25	35	S.M. Ajina Y. Gladston H. Shareefuddeen M.I. Arif. S.K Zamir Ahmed E.B. Chakurkar
4	Demonstration of scientific goat and poultry farming		7	13	20	S.M. Ajina Y. Gladston
5	Demonstration training on pheromone trap with lure under IPM	Kavaratti, Kadmat and Amini Islands	33	48	81	H. Shareefuddeen M.I. Arif. S.K Zamir Ahmed E.B. Chakurkar
6	Demonstration of low cost poultry feed preparation from locally available resources	RS Minicoy	2	9	11	T. Sujatha S.M. Ajina Y. Gladston H. Shareefuddeen M.I. Arif. R. Kiruba Sankar E.B. Chakurkar
7	Improved lines of rice (22)	Keralapuram, Diglipur	1	0	1	P. K. Singh P. Prabhu Y. Ramakrishna K.S. Sunder Rao
8	Controlled breeding programme and artificial insemination in goat	Birdline, South Andaman	13	12	25	P. Perumal R. R. Alyethodi Sharath S. Yeligar Jai Sunder
9	Controlled breeding programme and artificial insemination in goat	New Bimlitan, South Andaman	15	10	25	
10	Controlled breeding programme and artificial insemination in goat	New Wandoor, South Andaman	12	13	25	
11	Controlled breeding programme and artificial insemination in goat	Indira Nagar, South Andaman	10	15	25	
12	Age determination by dentition in goats	ICAR-CIARI, Sri Vijaya Puram	4	3	7	R.R Alyethodi P. Perumal Jai Sunder
13	FAMACHA card for health assessment in goats		4	3	7	
14	Medicine administration in goats		4	3	7	

Sl. No	Name of tecnology	Venue	Particpants			Coordinators
			M	F	T	
14	Fodder production for goat production	ICAR-CIARI, Sri Vijaya Puram	4	3	7	P.A. Bala R.R Alyethodi P. Perumal
16	Semen collection in goats		4	3	7	P. Perumal R.R. Alyethodi
17	Hoof Trimming in Goats		4	3	7	
18	First Fish Aggregating Device (FAD) Deployed at 11 Nautical Miles from Minicoy	RS Minicoy	11	0	11	S.M. Ajina Y. Gladston H. Shareefuddeen M.I. Arif. S.K Zamir Ahmed E.B. Chakurkar
	Iron supplementation to control IDA in piglets	Chauldari on 03/02/2024	10	18	28	A.K. De
	Probiotics supplementation for alleviation of weaning stress in piglets	Chauldari on 04/02/2024	10	18	28	
	Oral iron supplementation in piglets for control of iron deficiency anaemia	Rangat on 19/12/2024	38	30	68	A.K. De P. Perumal
	Oral iron supplementation in piglets for control of iron deficiency anaemia	Mayabunder on 20/12/2024	37	49	86	
	Probiotics supplementation for alleviation of weaning stress in piglets	Nimbudera on 20/12/2024	20	29	49	

Total Beneficiaries: 2495 (Male 1449 & Female 1046)

7.4 Seed & Planting Material

Crops	Variety /Produced	Category	Qty (Nos. / Kg)
Coconut (*Cocos nucifera*)	Dwarf	Seedlings	1292 nos.
Arecanut (*Areca catechu*)	Samruddhi and Mangala	Seedlings	23521 nos.
Acerola (*Malpighia glabra*)	IC-371804	Rooted cuttings	543 nos.
Passion fruit (*Passiflora edulis*)	Purple and Yellow	Seedlings	987 nos.
Andaman Kokum (*Garcinia dhanikhariensis*)	Identified collections	Seedlings and grafts	269 nos.
Malabar Tamarind (*Garcinia gummi-gutta*)	Identified collections	Grafts	168 nos.

Crops	Variety /Produced	Category	Qty (Nos. / Kg)
Kydiamangosteen (*Garcinia kydia*)	Identified collections	Seedlings	169 nos.
Surinam cherry (*Eugenia uniflora*)	Identified collection	Seedlings	60 nos.
Khatta phal (*Baccaurea ramiflora*)	Identified collection	Grafts	105 nos.
Watery rose apple *(Syzygium aqueum*)	Local	Air layers	120 nos.
Mango ginger (*Curcuma mangga*)	Local	Rhizomes	321 kg
Clove (*Syzygium aromaticum*)	Identified collections	Seedlings	699 nos.
Nutmeg (*Myristica fragrans*)	Identified mother plants	Seedlings	220 nos.
Cinnamon (*Cinnamomum verum*)	Konkan Tej, Konkan Tejpatta, YCD-1, IISR Nithyasree, IISR Navasree	Air layers Polyclonal seedlings	1829 nos. 314 nos.
Tejpat (*Cinnamomum tamala*)	Identified collection	Air layers	1064 nos.
Black pepper (*Piper nigrum*)	P-2, P-5, IISR Girimunda, IISR Malabar Excel	Rooted cuttings	5989 nos.
Bush pepper (*Piper nigrum*)	-	Rooted cuttings	550 nos.
Long pepper (*Piper longum*)	Viswam	Rooted cuttings	190 nos.
Andaman Pippali (*Piper sarmentosum*)	Identified collections	Rooted cuttings	756 nos.
Woody pepper (*Piper pendulispicum*)	Identified collection	Rooted cuttings	1389 nos.
Brazilian pepper (*Piper colubrinum*)	-	Rooted cuttings	230 nos.
Lemongrass (*Cymbopogon flexuosus*)	OD-19	Slips	1347 nos.
Medicinal and aromatic plants	*Citronella, Coleus, Pattharchoor, Aloe, Kalmegh, brahmietc*.	Slips, rooted cuttings, suckers and seedlings	1131 nos.
Jackfruit (*Artocarpus heterophyllus*)	Local	Seedlings	206 nos.
Rambutan (*Nephelium lappaceum*)	Identified types	Seedlings	160 nos.
Guava (*Psidium guajava*)	Identified mother plants	Air layers	465 nos.

Crops	Variety /Produced	Category	Qty (Nos. / Kg)
Dragon fruit (*Selenicereus costaricensis*)	Identified mother plants	Rooted cuttings	729 nos.
Banana (*Musa x paradisiaca*)	Local varieties	Sword suckers	94 nos.
Acid lime (*Citrus aurantifolia*)	Identified collections	Air layers	27 nos.
Lemon (*Citrus limon*)	Identified collections	Rooted cuttings	26 nos.
Pummelo (*Citrus grandis*)	Identified collections	Seedlings	122 nos.
Orange berry (*Glycosmis pentaphylla*)	Local	Seedlings	287 nos.
Papaya (*Carica papaya*)	ArkaPrabhat	Seedlings	1331 nos.
Carambola (*Averrhoa carambola*)	Local	Seedlings	404 nos.
Miscellaneous underutilized fruits (*Uvaria chamae, Syzygium claviflorum Syzygium cuminii*)	Local	Seedlings	630 nos.
Blood fruit (*Haematocarpus validus*)	Local	Seedlings	160 nos.
Heliconia	Mixed	Suckers	442 nos.
Ornamental gingers	Torch ginger, candle ginger and red ginger	Rhizomes	253 nos.
Eulophia andamanensis	Pretty Green Bay	Rooted cuttings	248 nos.
Mung (*Vigna radiata* L.)	CARI Mung 1	Breeder seed	1.80 kg
		TFL Seed	51.00 kg
	CARI Mung 2	Breeder seed	2.25 kg
	CARI Mung 3	Breeder seed	13.30 kg
		TFL Seed	106.00 kg
	CARI Mung 4	Breeder seed	12.80 kg
		TFL Seed	14.00 kg
	CARI Mung 5	Breeder seed	3.90 kg
Urd (*Vigna mungo* L.)	CARI Urd 1	Breeder seed	4.80 kg
		TFL Seed	22.00 kg
	CARI Urd 2	Breeder seed	1.10 kg
		TFL Seed	100.00 kg
Brinjal (*Solanum melongena* L.)	CARI Brinjal 1	TFL seed	0.27 kg
	CARI Brinjal 2	TFL seed	0.40 kg
Rice (*Oryza sativa* L.)	CARI Dhan 5	TFL seed	683.00 kg
	CARI Dhan 6	TFL seed	533.00 kg
	CARI Dhan 7	TFL seed	481.00 kg
	ANR 40 (CARI Dhan 10	TFL seed	900.00 kg

Crops	Variety /Produced	Category	Qty (Nos. / Kg)
Rice (*Oryza sativa* L.)	ANR 47 (CARI Dhan 11)	Breeder seed	80.00 kg
		TFL seed	226.00 kg
	Gayatri	TFL seed	1714.00 kg
Angel fish (*Pteropyllum scalare*)	Black angel	-	80 nos.
Betta splendens	Red Galaxy	Adult	120 nos.
Poecilia reticulata	Chilli red mosaic	Adult	200 nos.
Fish	Roopchanda	Table Size fish	25 Kg
Shrimp	Vannamei	Market size(15gm)	15 kg
Tomato	iihr varities, namdhari hybrid, macho hybrid	Seedlings	1119 nos.
Chilli	sooraj mugi, upright long, namdhari, mahyco hybrid		
Brinjal	iihr green long, purple round, CIARI brinjal 1, farmer variety		
Okra	iihr varities namdhari hybrid, mahyco hybrid		
Ornamental Plants	Coleus, Portulaca, Chinese balsam, Marigold, Cosmos	cuttings seedlings	200 nos.
Noni (*Morinda citrifolia*)	CIARI Dweep Samrudhi, CIARI Dweep Sampada	Seedlings	35 .
Screw pine (*Pandanus tectorius*)	-	Seedlings	10
Sesbania grandiflora	-	Seedlings	1600
Albizia lebbeck	-	Seedlings	1100
Chekurmanis	-	Seedlings	300
Jackfruit	-	Seedlings	450
Gmelina arborea	-	Seedlings	250
Bridellia tomentosa	-	Seedlings	500
Leuceana leucocephala	-	Seedlings	600
Elephant foot yam	Gajendra	Tuber	1100kgs
Greater yam	-	Tuber	850kgs
Colocassia	-	Tuber	450 kgs

Total Beneficiaries: 3692 (Male 2071 & Female 1621)

Success Stories

Success story: 1

Title: Technical backstopping on better management practices in shrimp culture

Name of farmers: Mr. P. Aqueel Anaz and Mr. Syed Anaz Ahmed Phone No.: 9474208456 ; Village: Brindaban ; District: South Andaman; Family size: 4 members; Name of Establishment (If any): Sea Byte Farms Private Limited ; Total area of farm: 7200 m^2 ; Number of shrimp ponds: 2 ; Year of establishment: 2023; Subsidy amount (if any) and Total project cost: Received Rs. 3.8 Lakhs as subsidy under Pradhan Mantri Matsya Sampada Yojana (PMMSY); Name of the Institution that provided the technological intervention: ICAR-Central Island Agricultural Research Institute, Sri Vijaya Puram; Annual production: 3247 kg (Single crop for 4 months); Annual turnover: Rs. 14.61 Lakhs

In 2023, Mr. P. Aqueel Anaz and Mr. Syed Anaz Ahmed embarked on shrimp aquaculture in Brindaban, South Andaman, encountering initial challenges that included significant mass mortality of their stocked shrimp seeds, specifically Penaeus vannamei, resulting in a loss of approximately three lakhs. To address these setbacks, they collaborated closely with scientists from the ICAR-Central Island Agricultural Research Institute, who provided critical technical guidance on best management practices encompassing health, feeding, and water quality management. With the guidance from scientists,he started utilizing the mobile application "Report Fish Disease," developed under the National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) project. This application serves as a valuable resource for understanding fish and shrimp diseases, facilitating effective management strategies, and enabling real-time reporting of disease occurrences.Through these concerted efforts, the duo successfully harvested 3.2 tonnes of shrimp from two ponds, covering an area of 6,000 m^2, over a four-month cultivation period after stocking 1.5 lakhs post-larvae. The endeavor yielded a total revenue of Rs. 14.61 lakhs and a net profit of Rs 5 lakhs, significantly boosting their confidence and paving the way for future expansion of their aquaculture operations.

Contributors: K. Saravanan, J. Praveenraj, R. Kiruba Sankar, Chittaranjan Raul, S.K. Zamir Ahmed and Y. Ramakrishna

Plate 28. Overview of shrimp farm located at Brindaban

Plate 29. Glimpse of the harvested shrimps (*Penaeus vannamei*)

Success story: 2

Title: Backyard nutritional kitchen gardening in Minicoy- A success story

Name: Moosa Manikfan Idiyakkal (I. Moosa); Address:Boduganduwaru, Aloodi Village, Minicoy; Village:Aloodi; Phone:9446215343; Family size: Living with his wife and two sons; Crop area:800 sq.m

Mr. Moosa Manikfan Idiyakkal, at the age of 75, exemplifies a commendable commitment to sustainable farming practices in Minicoy, Lakshadweep. Primarily focusing on banana cultivation for commercial gain, Mr. Idiyakkal cultivates several varieties, including Nendran, Poovan, Robusta, and Monthan. His collaboration with scientists from the regional station in Minicoy has been particularly beneficial, as they provided guidance on integrated pest management to address pest issues that significantly affect his crops. Through their support, he received not only traps and bio-pesticides to combat these challenges but also vegetable seeds and seedlings suited to the local soil and climatic conditions. As a result of his efforts, Mr. Idiyakkal generates an impressive annual income of approximately Rs. 40,000 from banana sales within his local community. His family's satisfaction and gratitude towards the technical guidance provided by ICAR-CIARI further highlight the positive impact of this collaboration on his farming endeavors.

Contributors: Gladston Y., Ajina S.M., Shareefudheen H.K., Arif M.I., S.K. Zamir Ahmed and E.B. Chakurkar

Success story : 3

Title : Enhancing farmers' income by utilizing controlled breeding and artificial insemination in goats

Name: Mr. P. Suresh Kumar**;** Village: Guptapara, South Andaman; Family size: 5; Total number of cattle: 88; Total number of goats: 60; Total number of desi poultry: 30 and Total number of local ducks: 4

Mr. P. Suresh Kumar, a 40-year-old progressive livestock farmer from Guptapara Village in South Andaman, has significantly enhanced the productivity of his goat farm over the past five years, despite facing numerous challenges such as poor growth rates, low litter sizes, extended kidding intervals, and high mortality rates. Recognizing the need for improvement, he sought the expertise of scientists from ICAR-CIARI, who provided him with comprehensive training on reproductive management in goats.Female goats were selected with at least one time kidded, normal kidding, no retention of placenta, no kidding abnormalities, no metabolic disorders, etc. immediately after 60 days (45-60 days) of kidding. These selected animals were treated with the package of practices for one month. After this supplementation, these goats were synchronized with hormones. Although 70% of animals expressed heat after the hormone's first injection, we followed the second injection for a higher conception rate after 9-10 days. These treated animals were inseminated on observed heat or at a fixed time. Artificial insemination was done for all the responded goats with quality-checked elite buck semen from the nuclear goat farm of ICAR-CIARI.

Moreover, Scientists, ICAR-CIARI checked the pregnancy with the procedure of manual palpation or ultrasonography after 45-60 days. As a result of these advancements, Mr. Kumar's annual revenue surged from Rs. 3.30 lakhs to Rs. 4.50 lakhs, with profits increasing from Rs. 1.85 lakhs to Rs. 2.50 lakhs, demonstrating the significant impact of scientific intervention of ICAR-CIARI on his farming operations. **Contributors**: P. Perumal, R.R. Alyethodi, Sharath S. Yeligar and Jai Sunder.

Success Story : 4

Title of the intervention: Improving farmers' socio-economic status through the adoption of controlled breeding and artificial insemination in goats

Name: Mr. Thirumalai; Village: Ranagachang, South Andaman; Family size: 3; Total number of goats: 25

Mr. Thirumalai, a dedicated 56-year-old small goat farmer from Ranagachang Village in South Andaman, has transformed his farming enterprise over the past 15 years, expanding from an initial herd of 2 goats to a thriving flock of 25, which includes various categories such as adults, growers, kids, and bucks. Despite facing significant challenges such as poor growth rates, low twinning rates, and prevalent reproductive issues, which stemmed from inadequate deworming practices and low-quality breeding methods, he sought assistance from scientists at ICAR-CIARI. Their guidance on scientific goat management and controlled breeding techniques, including artificial insemination, proved invaluable. By implementing a tailored package of practices suited for the humid tropical conditions of the Andaman and Nicobar Islands, Mr. Thirumalai improved his goats' health and productivity. Notably, the successful estrus synchronization and insemination of selected goats led to a 66.66% conception rate, resulting in four pregnancies and the birth of seven kids. His market acumen has also enabled him to sell his goats at significantly higher weights and prices, especially during festival seasons, increasing his annual revenue from Rs. 48,000 to Rs. 62,000, while his profits rose from Rs. 30,000 to Rs. 45,000. Through the integration of scientific practices, Mr. Thirumalai has not only enhanced his farm's performance but has also positioned himself for sustainable growth in the competitive livestock market of fragile Island conditions. **Contributors**: P. Perumal, R.R. Alyethodi, Sharath S. Yeligar and Jai Sunder.

Success story: 5

Title of the intervention:Commercial poultry hatching in Minicoy, Lakshadweep Islands

Name: Shri. Mohmmed Safarugothi; Village: Fallessery, Minicoy, Lakshadweep Islands; Family size: 6; Total number of layers: 380

Shri Mohammed Safarugothi, a 46-year-old tribal farmer from Minicoy, has significantly transformed his small scale broiler farming operations into commercial poultry hatching enterprise over the past few years, thanks to targeted interventions from the Regional Station in Minicoy, Lakshadweep Islands. Before seeking assistance in 2022, he faced numerous challenges, including an inconsistent supply

of day-old broiler chicks, as he relied on the Department of Animal Husbandry or made direct purchases from poultry hatcheries in Kochi, often leading to the acquisition of only 500 to 1,000 chicks annually. Additionally, he struggled with disease outbreaks, high mortality rates, slow growth, and elevated production costs, which hampered his farm productivity. The establishment of the DBT-Kisan hub at the Regional Station provided crucial technological support and training. Through this initiative, Mr. Safarugothi enhanced his knowledge of housing, feeding, proper vaccination schedules, and bio-security measures, along with gaining practical skills for operating a mini-incubator. With his recent investment in incubator capable of holding 2,500 eggs, he now successfully sells between 1,200 and 1,400 chicks each month. He has become a progressive business person on poultry hatching enterprise. He is scientifically operating the incubator with all proper records. The number of broiler farming is gradually increasing in the Minicoy Islands with demands for chicks are placed from other Islands also. **Contributors:** T.Sujatha, M.S.Ajina, Y. Gladson and Jai Sunder.

Information on other cell

Priority Setting, Monitoring and Evaluation (PME) Cell

PME Cell is involved in compilation and submission of various reports *viz*. Institute Annual Report, DARE/ICAR Report, 12 points report, cabinet monthly report, quarterly report, Women participation report, newsletter, ARMS, replies to parliamentary questions, SFC of the institute, annual plan of the institute etc. Besides, the cell is also conducting Institute Research Council (IRC) meeting, PMEC meeting, Institute Germplasm Identification Committee meeting, Award screening committee meeting, Publication Review Committee meeting etc. The PME cell also maintains repository of RPFs/RPPs of the Institute funded projects along with the annual reports.

The XVI Institute Research Council of ICAR-Central Island Agricultural Research Institute, Port Blair, was held from 10th, 11th and 16th May, 2024, under the chairmanship of Dr. E. B. Chakurkar, Director, ICAR-CIARI, Port Blair. All the scientists of the institute attended the meeting and presented the progress of ongoing projects. A total of 19 ongoing projects and 10 new institute-funded projects were discussed and reviewed during the meeting.

Study circle has been started under the Chairmanship of Director, ICAR-CIARI, Port Blair with a main objective to discuss various scientific issues such as discussion and refinement of research articles, presentation of research papers in the conference/seminar, presentation of latest scientific research and development by the scientists. Important documents of the Institute *viz*., annual report, Cabinet, 12 points, reply to parliament queries, along with publishing of research articles, technical bulletins, folders, books, farmer's data base were completed in time frame. The cell also maintains repository of RPFs of the Institute funded projects along with the annual report, bulletins, folders, books and other related publications for ready reference.

ICAR- CIARI Library

The current holding of ICAR-CIARI library includes of 8152 books, 510 Island publication, various journals, Hindi publication, technical books, institute publication and others reference material as well as collection of rare publication. The activities of library have been computerized using KOHA automation software and about 900 books have been upgraded the KOHA database. It has shared resource materials *viz*., Institute publication, leaflets, Price publication to Department of Environment and forest A&N Island and Coconut Development board A& N islands. The N. T. Singh Library conference hall of Library hosted Institute Meetings including IRC & RAC (62), Training Programmes (03), Institute Interview (03), Institute level Competitions (03) and Students Tour (02). Library Management committee also conducted exhibition of Agricultural books for School Students and aroung 560 students visited. CIARI Library Provided 30 days Library internship Training Programme for the Students of BLIS Students of Indira Gandhi National Open

University. 04 Students successfully Completed Library Internship course.

Official Language Cell activities

The Hindi Cell had conducted Hindi Pakhwada from 13th September to 30th September, 2024, wherein various competitions like extempore, essay writing, letter writing, noting and drafting, quiz competition and hindi typing were organized for all the employees of of ICAR CIARI to mobiles and motivate for maximum usage of Rajbhasha in research and administrative activities. The valedictory programme of Hindi Fortnight 2024 was concluded on 30.09.2024 at Dr. T. R. Dutta Conference Hall of ICAR-CIARI. On this occasion, one day seminar was organized on the topic" Rajbhasha Hindi is a symbol of cultural and social unity of the nation. On this auspicious occasion, Dr. Vyas Mani Tripathi, Professor and Head of Department, J.N.R.M., Sri Vijyapuram delivered a very energetic and inspiring guest lecture as Chief Guest. The winners of various competitions were felicitated with a cash prize by director and chief guest. Smti. G.V. Kantam, LDC and Smti. Champa Rani Das were awarded with an appreciation letter for maximum usage of Hindi for administrative work and providing invaluable support as and when required for Hindi cell and for its activities. One day workshop on the topic of "Application of Rajbhasha Hindi in administrative works" on 07.08.2024 at Dr. T. R. Dutta Conference Hall was orgnaised. On this occasion, Shri. Nirmal Kumar Dubey, Assistant Director & Head of Office, Regional Implementation Office (Eastern region), Kolkata delivered a lead lecture and A detailed lecture with power point presentation was presented by the Shri. Kanishk Bhukar, Administrative Officer on the topic "use of rajbhasha Hindi in administrative works while dealing of e-files and other software's".

Apart from this, Hindi cell submits Quarterly report in the prescribed proforma to council and online upload to Rajbhasha Vibhag website of Ministry of Home Affairs. The Quarterly meeting of the Official Language Implementation Commiteee conducts under the chairmanship of Director, ICAR-CIARI of our institute for effective and maximum usage of Hindi in our Institute. Hindi cell also involved to provide the basic translation and typing related support to all the division and sections of the Institute as and when required.

Plate 30. Workshop on 'Application of Rajbhasha Hindi in Administrative Works

Institute Technology Management Unit

Two technologies were commercialized, namely the Sex Determination Kit for Non-Ratite Birds and Dweep Tickure. Certification was granted for Dweep Carp Grower Feed and the Protocol of 2-7-10-15 Module of Oral Iron Supplementation for Controlling Iron Deficiency Anaemia (IDA) in Piglets. A total of nine ITMC

meetings were conducted with AGRINNOVATE INDIA LIMITED (AgIn), including interactions with entrepreneurs, price fixation on technologies, technology transfer, and public-private interaction meets. Patents were granted for five technologies, namely the Method of Determining the Sex of Non-Ratite Birds, A New and Safe Method of Blood Collection from Farm Pigs, An Acaricide Formulation for the Control of Ticks in Farm Animals, Cinnamon Bark Rubbing Tool, and Closed Water Circulatory System. A patent was filed for the Fly-Repellent Composition and Method of Preparation Thereof, along with five trademarks (Dweep, Vertigrow, Gau Maa Rakshak, Tikure, Han Greens), one copyright (Goat Housing with Slatted Flooring under Island Ecosystem), and five industrial design patents. Additionally, ITMU organized various IPR-related programs to promote innovation and intellectual property awareness.

Agricultural Knowledge Management Unit

The Agriculture Knowledge Management Unit (AKMU) is committed to advancing the application of ICT-based technologies and sharing information with all stakeholders in the agricultural and related sectors. The primary objective of the unit is to improve IT infrastructure at the institutional level. Currently, the unit operates a Local Area Network (LAN) that links 120 nodes with 120 computers, strategically distributed across various divisions and sections using optical fiber and CAT 6 cabling. To provide dependable internet access for staff to perform daily activities such as e-office operations, ERP tasks, and online portal access, a dedicated leased line with a capacity of 50 Mbps has been implemented. AKMU effectively presents and promotes a range of technologies, policies, and initiatives through its official website (https://ciari.icar.gov.in) and on widely used social media platforms, including Facebook (https://www.facebook.com/ICARCIARI/), Twitter (https://twitter.com/CIARIPortblair), and YouTube (https://www.youtube.com/@icar-ciari949).

Below are the key activities carried out by the Agriculture Knowledge Management Unit (AKMU) during this period.

- Updating of Institute website regularly, which is hosted at ICAR data centre (https://ciari.icar.gov.in).
- Maintained Desktop and other peripherals and upkeep Local Area network of entire campus.
- Procure, integrate and install various IT component and Software.
- Manage Audio/ Video presentations at Conference Hall, Auditorium and Director's Committee Room during workshop/ seminar/ lecture.
- Assistance provided to staff to work e-office, ERP, eHRMS, GeM, PFMS, Smart Performance Appraisal Report Recording Online Window (SPARROW).
- Updated research publication to Krishi Portal.
- Maintained Aadhaar Enabled Bio-metric Attendance System (AE-BAS).
- During this period one Computer Literacy program has been organized for the Skilled Supporting Staff at ICAR-CIARI on August 19, 2024. A total of 20 Skilled Supporting Staff participated in the program
- A Computer Literacy program was conducted

for the Skilled Supporting Staff at ICAR-CIARI on August 19, 2024. A total of 20 Skilled Supporting Staff participated in the program

Plate 31. Computer literacy program for Skilled Supporting Staff

Sports Activities

The sports contingent of ICAR-CIARI participated in the ICAR Inter-Zonal Sports Tournament - 2023 held at ICAR-CAZRI, Jodhpur, from October 14 to 17, 2024. Mrs. G.V. Kantam served as the Chief-De-Mission, while Mrs. Champa Rani Das served as the Team Manager. The team delivered an outstanding performance in the carrom (singles) event, with Mrs. Champa Rani Das securing the winner's position and Mrs. G.V. Kantam emerging as the runner-up. Dr. Eaknath B. Chakurkar, Director of ICAR-CIARI along with Dr. Jai Sunder, Chairman of the Sports Committee, and Dr. K. Saravanan, Member Secretary of the Sports Committee, congratulated and honoured

Plate 32. ICAR Inter-Zonal Sports Tournament at ICAR-CAZRI

the participants at ICAR-CIARI campus for their remarkable achievements and exemplary sportsmanship displayed during the tournament. Further, the Annual Sports - 2024 of ICAR-CIARI, Sri Vijaya Puram is being conducted with various indoor, outdoor and athletic events for the benefit of the employees.

Women's empowerment activities

Workshop on Sexual harassment at the workplace and AIDS control program at ICAR-CIARI, Sri Vijaya Puram

On December 9, 2024, ICAR-CIARI, Sri Vijaya Puram hosted a significant workshop focusing on the prevention, prohibition, and redressal of sexual harassment against women in the workplace, in alignment with the Prohibition of Sexual Harassment (POSH) Act of 2013. The workshop featured a guest lecture by Advocate Smti. Rinku Narayan from the District and Sessions Court of A&N Islands, who provided an in-depth overview of the history and implications of the POSH Act. Concurrently, Dr. Jahanara Yasmeen, Deputy Director (MS&IEC) of the A&N AIDS Control Society, raised awareness

about AIDS control, highlighting the intersection of health and safety in workplace environments. In his closing remarks, Dr. E.B. Chakurkar, Director of ICAR-CIARI, encouraged women to assertively voice their experiences regarding workplace harassment. The program concluded with a vote of thanks delivered by Shri Kanishk Bhukar, Administrative Officer at ICAR-CIARI, underscoring the institution's commitment to fostering a safe and respectful work environment.

Plate 33. Workshop on Sexual harassment at the workplace and AIDS control program

Swacch Bharat Abhiyan

On September 19, 2024, a successful Swachhata Run was held at the ICAR-CIARI, Sri Vijaya Puram campus, aligning with the objectives of the Swachh Bharat Mission. Dr. Abhilash warmly welcomed the Director of CIARI and a diverse group of participants, including scientific, administrative, technical, skilled, and contractual staff, who enthusiastically engaged in the event. The run commenced promptly at 10:00 AM from Zero Point, with participants completing a lap around the campus while pledging to uphold cleanliness standards in their workplaces and homes, and to reduce their reliance on single-use plastics. Additionally,

Plate 34. Swachch Bharat Abhiyaan

a "Waste to Wealth" workshop was organized to advocate sustainable waste management practices by transforming organic waste into valuable resources. In his address, Dr. Abhilash urged staff members to embrace composting in their gardens and decrease their dependence on chemical fertilizers, reinforcing the commitment to a cleaner and more sustainable environment.

PG Cell

Post Graduate Cell has coordinated academic programmes for 18 students pursuing B.Sc., M.Sc., B.Tech., B.E., M.Tech and Ph.D., to complete the part of degree programmes in terms of dissertation work /internship. They were trained in various fields such medicinal plants, Marine ecosystem and biodiversity, processing and value addition, isolation and characterization of probiotic cultures, molecular and genetic tools, Molecular Screening of Rice Ril Population For Blb Resistance, Acaricidal and Antimicrobial resistance. The duration of training/internship varied from 1 to 9 months.

Estate Section

The Estate Section of the Institute develops infrastructures to facilitate research activities for the Scientist's of the Institute. It also takes up the repair and maintenance of the Institute building to keep the building in good health. In addition to these works water supply and distribution to the residential and non-residential buildings of the Institute are also done by this Section. It also ensures uninterrupted power supply to the Central Lab and other office buildings of the Institute through our DG set when normal power supply from the Electricity department is cut.

The total value of the work executed in this year was Rs.82.27 including C/o new structures and repair and maintenance of Institute buildings. 10 KVA solar power generation system has been procured and installed in the Library building by which the dependenceof power supply from the Electricity Department , A&N Islands for this building and phase – I Administrative building have been eliminated. About 25 nos of solar sheet light have been installed in the different farms of the Institute, replacing old LED street lights. Kissanmela was organized in March 2024 in our Institute. For this mela a big pandal made for accommodating 800 farmers. Also 20 nos of stalls were made for displaying posters and exhibits. The garden area of the Phase – I building was face lifted by making pipe railing with stainless steel pipes. The window portion of the Central Lab building was covered with plastic mesh to prevent bird droppings on the wall and sides of the building. An aluminium partition with plain glass sheet has been made in the committee room to have face lift and arrest A/C leak in the Library building. A cattle crate has been fabricated and installed in the cattle shed. A decorative Footpath and cement concrete steps were made in the Sippighat farm under Eco Tourism model.

The old damaged cattle shed has been dismantled and in that place a modern cattle shed has been constructed for accommodating about 30 – 40 cattles. Major repair and painting work has been carried out on the outer side of the old Guest house for proper maintenance and facelift. The complete roofing sheet of the threshing shed at Bloomsdale farm has been replaced with new sheet. The shade net house constructed near sports ground has been repaired and painted to facilitate research activity. Minor repair works and a partition also done in pig shed no -1. The 3 nos of big existing cement concrete water tanks have been repaired for fresh waterfish culture. The filter media of the filter units installed at Garacharma farm has been replaced for filter water supply to non – residential buildings of the Institute. About 23 nos of different types of Institute quarters were repaired and painted as per the requirements of the residents.

Central Instrumentation Facility;

The centralized laboratory facility at CIARI is equipped with advanced and sophisticated instruments, supporting both conventional and modern research in agriculture and allied sciences. Key equipment includes a GC-MS, fluorescence microscope, -80°C deep freezer, -20°C deep freezer, rotary evaporator, cooling centrifuges, spectrophotometer, gel documentation system, mini protein apparatus,

and a lyophilizer. This year, the facility was further enhanced with the addition of new instruments such as a vertical gel electrophoresis system with blotting module, UV-VIS spectrophotometer, dry bath, fume hood, and a cooling centrifuge equipped with fixed-angle and swing-out rotors.

Round up of Institute Activities

Republic Day celebrations

ICAR-CIARI, Sri Vijaya Puram celebrated the 75th Republic Day with great enthusiasm. Dr. E.B. Chakurkar, Director, CIARI unfurled the tricolour and paid tribute to our great leaders. He acknowledged the impressive achievements of the staff of ICAR CIARI that have not only brought honor to our Institute but have also made significant contributions at both the national and island levels. Dr. E.B Chakurkar urged all staff to continue striving for excellence, highlighting our collective responsibility towards the advancement of agriculture and allied sectors in the A&N Islands and Minicoy, Lakshadweep. Celebrations also took place at Krishi Vigyan Kendras (KVK) and Regional Stations, Minicoy with the National Flag raised by the Scientist in charges.

Plate 35. Republic Day celebrations

Island Kisan Mela held at ICAR-CIARI

The Island Kisan Mela, focused on Agripreneurship Development in Islands, was successfully organized by ICAR-CIARI on March 20, 2024. The event saw active participation from around 500 farmers across the Andaman & Nicobar districts. Dr. Mani Chellapan commended the technological advancements of ICAR-CIARI, while Dr. Lal Ji Singh emphasized the vital role of women in agriculture. Additionally, Padma Smti. Kamachi Chellammal expressed gratitude to ICAR-CIARI and KVK for their support in her national recognition of natural farming practices.

Plate 36. Kisan Mela-2024

Workshop on Sustainable Plant Protection Strategies (SPPS- 2024)

The Andaman Science Association (ASA) and ICAR-CIARI jointly organized the SPPS-2024 workshop on sustainable plant protection strategies from March 21-22, 2024. Dr. N.K. Krishna Kumar, Ex-DDG of Horticulture Sciences, ICAR-New Delhi, inaugurated the event, while Shri. Vikram Singh, DANICS, Director of Agriculture, and Dr. Mani Chellapan, Dean, College of Agriculture, Kerala Agricultural

University, Thrissur graced the occasion as Guests of Honour. Notable speakers included Dr. T.K. Behera, Dr. N.K. Krishna Kumar, Dr. Mani Chellappan, Dr. Vinayaka Hegde, Dr. R. Selavarajan, and Dr. A.N. Shylesha. The workshop featured insightful discussions on various topics, attracting 114 participants from diverse backgrounds.

Plate 37. Workshop on Sustainable Plant Protection Strategies

Fish aggregating device (FAD) deployed at Minicoy, Lakshadweep

ICAR-Central Island Agricultural Research Institute's Regional Station at Minicoy successfully installed its first fish aggregating device (FAD) on 17 February 2024. This initiative, led by a team of scientists from CIARI, aims to enhance the livelihoods of the tribal fisher community by improving fish productivity and reducing search time during fishing. The FAD is strategically anchored 10.5 nautical miles offshore and is expected to ensure fish availability while promoting sustainability and safety for local fishermen.

Plate 38. Fish aggregating device (FAD) deployed at Minicoy, Lakshadweep

Celebration of World Veterinary Day

ICAR-CIARI, in collaboration with DAHVS, Andaman and Nicobar administration conducted an animal health camp in Ranganchang village, Boednabad Panchayat, in observance of World Veterinary Day. This year's theme, "Veterinarians are Essential Health Workers," underscores the vital role veterinarians play in both animal and public health. The camp included health check-ups, fertility evaluations, and mass deworming for over 100 animals. ICAR-CIARI has also provided farmers with essential mineral and vitamin supplements.

Dr. Himanshu Pathak, Secretary, DARE and DG, ICAR visits ICAR-CIARI

Dr. Himanshu Pathak, Secretary, DARE, and DG, ICAR, visited ICAR-CIARI, Sri Vijaya Puram, on 5th May 2024. During his visit to different research and farm units, he interacted with the scientists and technical staff and urged them to do more innovative research work with significant outcomes for the benefit of the farming community. Dr. E.B.Chakurkar, Director, ICAR-CIARI gave an overall presentation about the institute profile, achievements, and developments made by the institute. On the occasion, he felicitated Padmashree awardee Smti. K. Chellamel and a progressive farmer Shri. Chintaharan Biswas, whose mango has

been registered as Chinta Mango by PPVFRA, New Delhi. Dr. V.B. Patel, ADG (F&PC), and Dr. Pradeep De, Director, ATARI, Kolkata, were also present on the occasion. Various institute publications and a mobile application named NICMIS (Nicobar Coastal Management Information System) were also released by the Hon'ble Secretary, DARE and DG, ICAR, on the occasion.

Plate 39. Dr. Himanshu Pathak, Secretary, DARE & DG, ICAR's visit to ICAR-CIARI

Inauguration of Administrative -cum-Training Building KVK, Nimbudera

Dr. Himanshu Pathak, Secretary, DARE & Director-General, ICAR, New Delhi, inaugurated the Administrative-cum-Training Building of KVK, Nimbudera on 6th May 2024

Plate 40. Dr. Himanshu Pathak inaugurates KVK Nimbudera building

in the presence of Dr. V.B. Patel, Assistant Director General (Fruits & Plantation Crops), Dr. Pradip Dey, Director, ICAR-ATARI, Kolkata and Dr. E.B. Chakurkar, Director, ICAR-CIARI. DG also visited progressive farmers' fields and interacted with the Karen community at Webi village about the farming practices.

10th Research Advisory Council (RAC) meeting held at ICAR CIARI

The second meeting of the 10th Research Advisory Committee (RAC) at ICAR-CIARI, Sri Vijaya Puram, chaired by Dr. Anil Kumar Singh on 08 May 2024. Key discussions included strengthening the Minicoy Regional Station, impact analysis of technologies, and the Green Credit program. Specific recommendations were made for the Divisions of Horticulture and Crop Improvement, Animal Sciences, Natural Resource Management, and Fisheries Science, emphasizing research initiatives, resource management, and commercialization of technologies to be taken up as future research programs.

Plate 41. 10th RA C meeting

ICAR-CIARI and TIFAC, DST jointly organized a round table meeting on "Climate Resilient Technologies for Island Agriculture"

ICAR-Central Island Agricultural Research Institute, Sri Vijaya Puram, in collaboration with the Technology Innovation Forecasting and Assessment Council (TIFAC), DST, New Delhi, organized a Round Table Discussion on "Climate Resilient Agriculture Technologies for Islands" on 15 May 2024, at ICAR-CIARI. Prof. Pradeep Srivastava, Executive Director, TIFAC, was the Chief Guest, while Dr. Sammi Reddy, Director, ICAR-NIASM, Baramati and Dr. Gauranga Kar, Director, ICAR-CRIJAF, were the Guests of Honour. The program was coordinated by Dr. Gautam Goswamy, Scientist-G, TIFAC, and Dr. Jai Sunder, Head, Division of Animal Science under the supervision of Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI. The meeting was attended by expert speakers from different parts of the country whereas representatives from the development departments, BSI, and scientists of ICAR-CIARI participated in the meeting.

Plate 42. Round table meeting on "Climate Resilient Technologies for Island Agriculture"

World Environment Day celebrations at ICAR-CIARI

In celebration of World Environment Day, ICAR-CIARI, located in Sri Vijaya Puram, organized an impactful mass tree-planting initiative that engaged all staff members. The event successfully resulted in the planting of 750 tree seedlings across a substantial area of 7,000 m² on campus, featuring a diverse range of species including *Albizia lebbeck* Jackfruit, *Leucaena leucocephala, Gmelina arborea, Chakurmani*, and *Sesbania grandiflora*. Dr. E.B. Chakurkar, the Director of ICAR-CIARI, underscored the critical role that trees play in mitigating greenhouse gas emissions and enhancing carbon sequestration. He encouraged staff and their families to commit to planting at least one tree, emphasizing its significance for the prosperity of future generations, as well as for environmental sustainability. The initiative was adeptly coordinated by Dr. I. Jaisankar, Senior Scientist and Nodal Officer of the Swachh Bharat Abhiyan. Additionally, the KVK in Nicobar contributed to the World Environment Day

Plate 43. World Environment Day celebrations

celebrations by distributing over 500 saplings of various species, including Andaman Padauk, guava, lemon, jamun, tamarind, bael, passion fruit, and papaya, thereby furthering the cause of environmental stewardship.

10th International Yoga Day-2024 celebrations

ICAR-CIARI, Sri Vijaya Puram, along with its Regional Station in Minicoy, celebrated 10th International Yoga Day on June 21, 2024. Dr. E.B. Chakurkar, Director of ICAR-CIARI, highlighted the importance of yoga in daily life for maintaining health, prosperity and happiness. Shri. P.T. Mathew and Shri. Bikas Chandra Mondal, Yoga Demonstrators from Patanjali Yoga Centre in Prothrapur, Sri Vijaya Puram, demonstrated yoga to all participants.

Plate 44. International Yoga Day -2024

47th Foundation Day celebration

The 47th Foundation Day of ICAR-Central Island Agricultural Research Institute, Sri Vijaya Puram, was commemorated on June 24, 2024. This significant milestone serves as a reminder of the institute's ongoing commitment to agricultural research and development tailored to the unique challenges of island ecosystems. Dr. D.R. Singh, Vice Chancellor of Bihar Agricultural University, Sabour, Bihar, delivered the Foundation Day lecture on "Next-Gen Agriculture: ICAR-CIARI's Strategic Priorities for Growth" through virtual mode. He congratulated all the institute staff for their achievements and for reaching new heights. The Chief Guest, Dr. C. Sivaperuman, OIC of ZSI, Sri Vijaya Puram, A&N Island, praised the institute for its commitment to serving the islands, especially in areas such as breed registration, documentation, patents, and the development of new strategies. Moreover, Dr. Eaknath B. Chakurkar, Director of ICAR-CIARI, took the opportunity to acknowledge the strenuous efforts and dedication of the staff members.

Plate 45. 47th Foundation Day celebration

Observation of World Ocean Day 2024

ICAR-Krishi Vigyan Kendra, Nicobar observed World Ocean Day-2024 in hybrid mode aiming to raise awareness and foster scientific knowledge on the importance of healthy oceans for sustaining life on earth under the theme "Awaken New Depths". A total of 39 farmers participated in the programme. The Chief Guest, Dr. Pradip Dey, Director, ICAR-ATARI, Kolkata, highlighted threats such as ocean acidification, warming, and plastic pollution that endanger

marine life and food security, underscoring the critical need to conserve oceans as emphasized in Sustainable Development Goal 14 for sustaining life on Earth. Dr. Santosh Kumar, Head, ICAR-KVK, Nicobar accentuated the significance and backdrop of the day.

State-level workshop cum seminar on "Scope and challenges of Natural Farming organized in A & N Islands"

The ICAR-CIARI, Sri Vijaya Puram in collaboration with the Department of Agriculture, Andaman & Nicobar Administration, organized a State-Level Workshop on "Scope and Challenges of Natural Farming in A & N Islands" on 13 August 2024. The event was inaugurated by Mr. Keshav Chandra, IAS, Chief Secretary, A&N Administration, in the presence of Ms. Nandini Paliwal, IAS, Commissioner-cum-Secretary (Agriculture), Shri. B.S. Jaglan, Secretary (Agriculture), Dr. E.B. Chakurkar, Director, ICAR-CIARI, Shri. Ahishek Gulia, Director of Agriculture and Padmashri Smti. K. Chellamal. The Chief Secretary highlighted the benefits of natural farming, and Ms. Nandini Paliwal, IAS, suggested developing actionable points for its promotion. Dr. E.B. Chakurkar, Director, ICAR-CIARI emphasized nutritional security through natural farming. The workshop was attended by 120 farmers and officials from various line departments.

78th Independence Day celebration

ICAR-CIARI celebrated the 78th Independence Day with enthusiasm at its Garacharma campus, KVK South Andaman, KVK North and Middle Andaman, KVK Nicobar and the Regional Station in Minicoy, Lakshadweep. Dr. E.B. Chakurkar, Director, ICAR-CIARI, raised the National Flag and highlighted the institute's achievements, including granting nine patents, filing four new patents, and obtaining two copyrights and one trademark. He also mentioned the certification of six technologies, registration of three breeds, and submission of three technologies for commercialization. He also outlined the important infrastructure developments including a dairy shed, ornamental fish breeding unit, and fish aggregating device deployment in Minicoy, Lakshadweep. He also provided an overview of the research publication, noting that 56 papers have been published with

Plate 46. State-level workshop on 'Scope and Challenges of Natural Farming'

Plate 47. Independence day celebration

a NAAS rating of 6 or higher and encouraged the staff of ICAR CIARI to continue doing their good work.

Workshop and awareness programs on yoga and meditation

The Central Island Agricultural Research Institute Employee Welfare Association (CIARIEWA) of ICAR-CIARI, Sri Vijaya Puram, in collaboration with Prajapita Brahma Kumaris Ishwariya Vishwa Vidyalaya, organized a "Workshop on Rejuvenating Inner Strength" on 20 August 2024. Sister B.K. Sharmistha, a resource person from Rajayoga Centre, delivered sessions on meditation and inner strength for the wellbeing of the employees.

Plate 48. Workshop and awareness programs on yoga and meditation

Further, an awareness programme on 'Yogic, Ancient, and Traditional Science for Healthy Living was also held on 21 August 2024, with Shri. N. Sera Arasan from Sri Annai Aravind Healthcare delivering lectures on yoga, stress management, and disease prevention.

Hindi Fortnight celebrations at ICAR-CIARI Sri Vijaya Puram

The valedictory program of Hindi Fortnight 2024 was held on 30 September, 2024 at Dr. T. R. Dutta Conference Hall of ICAR-CIARI. On this occasion, a seminar was organized on the topic "Rajbhasha Hindi: A Symbol of Cultural and Social Unity of the Nation." Dr. Vyas Mani Tripathi, Professor and Head of the Department (Hindi), J.N.R.M., Sri Vijaya Puram, delivered a highly energetic and inspiring guest lecture as the Chief Guest. Dr. Eaknath B. Chakurkar, Director, ICAR-CIARI, in his address, urged all employees to carry out their work in Hindi with devotion and dedication, and encouraged them to spread and promote the use of Hindi with the same enthusiasm. The entire programme was coordinated by Shri K. Shyam Sundar Rao, In-Charge of the Hindi Cell, under the guidance of Dr. Eaknath B. Chakurkar, Director of ICAR-CIARI, Sri Vijaya Puram.

Plate 49. Hindi Fortnight celebrations

Dr. J.K. Jena, DDG (Fisheries), visited ICAR-CIARI, Sri Vijaya Puram

Dr. J.K. Jena, Deputy Director General (Fisheries), ICAR, New Delhi, visited the ICAR-Central Island Agricultural Research Institute (CIARI), Sri Vijaya Puram on 13th November 2024. During his visit, he interacted with fisheries scientists and all division heads of ICAR-CIARI.

Dr. Eaknath B. Chakurkar, Director of ICAR-CIARI, provided a brief overview of the institute's achievements and activities. Dr. K. Saravanan, Principal Investigator, gave a presentation on the progress of the second phase of the NSPAAD project. Dr. J.K Jena recommended exploring the inclusion of ICAR-CIARI in the All-India Network Project on ornamental fish. Additionally, he proposed conducting a feasibility study for seaweed farming in collaboration with CMFRI, Cochin. Dr. J K Jena also visited the Marine Hill Research Laboratory followed, and supervised ongoing activities, including seaweed farming, mud crab fattening, shrimp biofloc culture, and the marine ornamental fish unit.

Plate 50. Dr. J.K. Jena, DDG (Fisheries), visits ICAR-CIARI, Sri Vijaya Puram

Agriculture Education Day (AED) – 2024 celebrations

ICAR-CIARI celebrated "Agriculture Education Day" on December 3, 2024, in honor of the birth anniversary of Dr. Rajendra Prasad, the first President of India. ICAR-CIARI organized a series of events for school students from 02-03 December 2024. A total of 37 students from grades 5 to 8 participated in the painting competition on the theme "Showcase

Plate 51. Agricultural Education Day celebration

the Charm and Beauty of Rural Landscapes and Farming Life," representing twelve different schools. On the afternoon of 02, December 2024, a speech competition was held for students in grades 9 to 12, with 37 participants from different schools. On 03, December 2024, students from various schools visited the Garacharma campus to explore the research and development (R&D) facilities of ICAR-CIARI. During the valedictory program, Dr. Lal Ji Singh and Dr. E.B. Chakurkar emphasized agriculture's importance and encouraged students to consider careers in this diverse field.

KVK-CIARI, South Andaman organized an "Awareness cum demonstration program on CIFA-Brood-Vac vaccine in fish farming"

ICAR CIARI successfully conducted an Awareness cum Demonstration program on the CIFA-Brood-Vac vaccine for fish farming on December 4, 2024, at ICAR-CIARI, South Andaman in collaboration with ICAR CIFA, Odisha. The objective of the programme was to educate Island farmers and hatchery owners about the benefits of CIFA-Brood-Vac vaccine in fish farming. The Chief Guest, Ms. Jagtap

Kalyani Rajendra, applauded the efforts of CIARI in organizing the program and Dr. Eaknath B. Chakurkar, highlighted the way the vaccine will help and benefit the fish farming community of the Islands in disease management thereby enhancing their income. Dr Mrinal Samanta, Principal Scientist, ICAR-CIFA explained that the immunity-based vaccine is designed to enhance broadly acting innate immunity in fish spawns. The event, attended by key officials and 55 local fish farmers, aimed to educate participants on the vaccine's benefits for enhancing fish health and productivity

Plate 52. Awareness cum demonstration program on CIFA-Brood-Vac vaccine in fish farming

Conference on Organic/Natural Farming organized at ICAR-CIARI

Regional Centre of Organic and Natural Farming (RCONF), Bhubaneshwar in association with ICAR-CIARI, Sri Vijaya Puram, Krishi Vigyan Kendra (South Andaman) and Department of Agriculture, Andaman and Nicobar Administration organized ''One Day Regional

Plate 53. Conferencce on Organic/Natural farming

Conference on Organic/Natural Farming (PKVY & LRPs)'' on 19th December 2024 at ICAR CIARI Sri Vijaya Puram. The program was chaired by Dr. Apurva Sharma Director of Agriculture, Andaman and Nicobar Administration who emphasized the increase in the economic status of farmers through Organic/Natural Farming. Dr. E.B. Chakurkar Director CIARI mentioned the importance, health benefits, and need of Organic/Natural Farming in today's scenario. Dr. Jagat Singh Regional Director RCONF covered various aspects of Organic/Natural Farming which are principles, present status, and scope in the Andaman and Nicobar Islands. Dr. S K R Ingle Assistant Director RCONF explained about Participatory Guarantee System (PGS), Large Area Certification (LAC), and Paramparagat Krishi Vikas Yojana (PKVY). Dr. Y Ramakrishna Principal Scientist and Head KVK concluded the program with a vote of thanks. A total of 104 farmers and farm women embarked on the success of the conference.

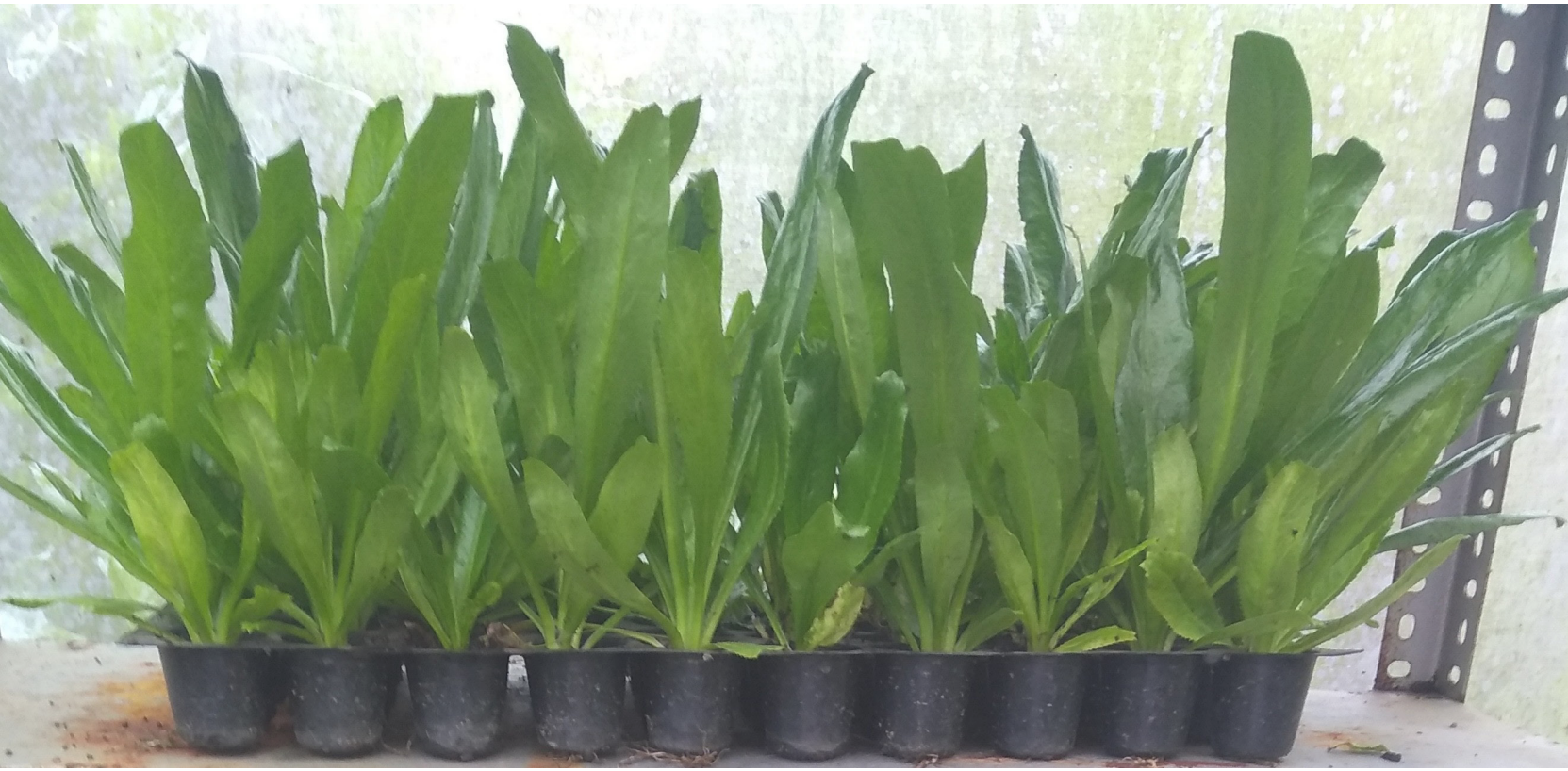
Awards And Recognition

Name of Person	Award	Awarding Agency
K. Saravanan	Dr. C.V. Kulkarni Best Young Scientist Award-2023	ICAR-CIFE, Mumbai on 14.06.2024
	Young Scientist Award-2024	Society of Fisheries and Life Sciences, College of Fisheries, Mangaluru, Karnataka on 19thNovember 2024
	Appreciation Certificate	Chairman, Tribal Council, Harminder Bay
K. Saravanan J. Praveenraj Chittaranjan Raul	Best Working Lab "Molecular Biology Laboratory of Fisheries Science Division" for the year 2023	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
Ajit Arun Waman	Invited Expert	Meeting on the Strategies for promotion of Cinnamon at National Level organized by Directorate of Arecanut and Spices Development, Kozhikode, Kerala during 23/01/2024
	Editor	Current Agriculture Research Journal (Enviro Research Publishers), Journal of the Andaman Science Association (ASA), Institute Newsletter, Institute Annual Report- 2023
	Peer Reviewer	Forest Science and Technology (Taylor and Francis), The Indian Journal of Agricultural Sciences (ICAR), Indian Journal of Horticulture (IAHS), Journal of Spices and Aromatic Crops (ISS)
Ajit Arun Waman Pooja Bohra	Appreciation Certificate for the Most Efficient Experimental Unit of the Institute - Horticultural Plants Propagation Unit for the year 2023	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
Pooja Bohra	Peer Reviewer	Frontiers in Horticulture (Frontiers), Journal of Horticultural Sciences (SPH), National Academy Science Letters(Springer Nature), Scientific Reports (Springer Nature) and the Indian Journal of Agricultural Sciences (ICAR)

Name of Person	Award	Awarding Agency
J. Praveenraj K. Saravanan R. Kiruba Sankar	Award for Commercialization of Technology on "Dweep Larval Rearing Technology for Fancy Guppy Fish" for the year 2023	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
J. Praveenraj	Felicitation as an invited resource person	National Workshop on Advances in Fish Systematics: Morphological and Molecular Approaches organized by ZSI, Hyderabad in association with ICAR NBFGR, held at Hyderabad on 18-19 January 2024
	Felicitation as an external fish expert	Freshwater Fish Red Listing Workshop IUCN, organized by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (GIZ) and ICAR-DCFR at Guwahati from 27-29th March 2024
Gladston Y. Ajina S.M. team ICAR-CIARI, RS, Minicoy	Best research farm award – Experimental Farm Regional Station Minicoy, Lakshadweep	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
	Recognized for displaying activities at exhibition stall	Coco Fest Kavaratti during November 2024
Prabhu P.	Best Oral Presentation First prize	Indian Horticulture Summit-Cum-International Conference-2024-Society for Horticultural Research and Development
Talaviya Harshangkumar	Best Oral Presentation Award	National Seminar, jointly organized by Medicinal and Aromatic Plants Association of India & ICAR-DMAPR
P. Perumal P. A. Bala Jai Sunder	Appreciation certificate for Best Experimental Unit-Modern Dairy Unit	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands

Name of Person	Award	Awarding Agency
P. Perumal	Royal Fellow Award-2024	International Organization for Academic and Scientific Development, Assam, India
	Incredible Professionals of India-24	Education Expo TV, Mumbai, Maharashtra, India
R.R Alyethodi	PG Faculty	ICAR-IVRI, Izatnagar, Bareilly, UP
	Reviewer	Biological Rhythm Research, Indian Journal for Animal Sciences
	Micro observer for the legislative assembly election 2024	Andaman and Nicobar Administration
Sharath S. Yeligar	First Prize, Extempore, Hindi Pakhwada	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
	Appreciation Certificate for New Initiation for new initiatives	ICAR-CIARI, Sri Vijaya Puram, Andaman and Nicobar Islands
Raj Narayan	ISHRD Fellow 2023	Indian Society of Horticultural Research & Development during Progressive Horticulture National Symposium - 2024 held during 17-19 October 2024 at HNB Central University Srinagar (UK).
	Co- Chair of a Session	Progressive Horticulture National Symposium - 2024 on Horticulture in Himalayas held during 17-19 October 2024 at HNB Central University Srinagar (UK)
	Invited lecture	Progressive Horticulture National Symposium - 2024 on Horticulture in Himalayas held during 17-19 October 2024 at HNB Central University Srinagar (UK).
	Peer Reviewer	African Journal of Agricultural Research (AJAR)
	Keynote Speaker	Plenary session of International Conference “Aushadh Manakam-2024,” on Ayurvedic Drug Standardization: Challenges & Solutions held at Dr. SRRAU, Jodhpur (Raj.) during 5-7 December 2024.

Name of Person	Award	Awarding Agency
Arun Kumar De Perumal Ponraj T. Sujatha Jai Sunder Debasis Bhattacharya Eaknath B. Chakurkar	Technology Certificate for2-7-10-15 module of oral iron supplementation for control of iron deficiency anaemia (IDA) in piglets	ICAR, New Delhi
Arun Kumar De	Peer Reviewer	Animals, Tropical Animal Health and Production, Theriogenology, Antibiotics, Genes, Indian Journal of Animal Sciences
	Outstanding Reviewer Award-2024	Animals
	Appreciation Certificate	Chairman, Tribal Council, Harminder Bay
	Appreciation Certificate	Chairman, Tribal Council, Kamorta
	Micro observer for the legislative assembly election 2024	Andaman and Nicobar Administration
I. Jaisankar	Tribal Council, Kamorta Islands	Certificate of Appreciation from Chairman, Tribal Council, Kamorta Islands
	First Captain, Kakana Village, Nancowrie Islands	Certificate of Appreciation from First Captain, Kakana Village, Nancowrie Islands



Ongoing Research Projects

External funded

Sl. No.	Title	PI/CO-PIs	Budget (lakhs)	Funding Agency
1.	National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) in Andaman and Nicobar Islands (Second phase) (2022-2025)	**K. Saravanan** J. Praveenraj R. Kiruba Sankar	53.70	Department of Fisheries, Govt. of India
2.	Augmenting livelihood, resilience and knowledge generation through coastal fisheries information hub for Nicobari tribes of Car Nicobar Island. (2021-2025)	**R. Kiruba Sankar** D. Karunakaran Sirisha Adamala K. Saravanan J. Praveenraj Gladston Y. Ajina S.M.	158.0	Department of Science & Technology, New Delhi
3	CSS (MIDH) NHM Project on Spices (2022- Continuing)	**Ajit Arun Waman**	9.63	Directorate of Arecanut and Spices Development, Kozhikode, Kerala
4	Standardization of agro-techniques and nursery protocol for *Centratherum anthelminticum* (L.) Kuntze ex Gamble.(2023-2025)	**Ajit Arun Waman** Jishin Prakash T.S. M. Akashlal	9.10	Central Council for Research in Ayurvedic Sciences, Ministry of Ayush, Govt. of India, New Delhi
5	Integrated Agromet Advisory Services for A&N Islands (2008-2024)	**T. Subramani** T.P. Swarnam S.K. Zamir Ahmed Jai sunder P.K. Singh	75.0	India Meteorological Department, Pune
6	Monitoring of pesticide residues at national level (2017- Continuing)	**Talaviya H. Kumar**	10.10	Ministry of Agriculture and Farmer Welfare, Govt. of Indi
7	Gramin Krishi Mausam Seva (2024-2026)	**Abhilash** T. Subramani	23.0	IMD, Ministry of earth Science, Govt. of India, New Delhi

Sl. No.	Title	PI/CO-PIs	Budget (lakhs)	Funding Agency
8	State Specific Action Plan (SSAP) for Water Sector (2019-2024)	**T. Subramani** Sirisha Adamala B.K. Nanda P.A. Bala I. Jaisankar Y. Gladston	20.01	Andaman & Nicobar State Water & Sanitation Mission, Sri Vijaya Puram
9	Development and Standardization of DUS Characteristics Procedures for Noni (*Morind acitrifolia*L.) (2013-2024)	**I. Jaisankar**	39.50	Protection of Plant Varieties&Farmers Rights Authority (PPV & FRA), Govt. of India, New Delhi
10	Bio-prospecting of *Pandanus* sp. (Kewda) of Andaman and Nicobar Islands for its medicinal properties. (2021-2024)	**I. Jaisankar** B. A. Jerard A. Velmurugan M. Rajkumar R. Jaya Kumaravaradan	32.52	National Medicinal Plants Board, Ministry of Ayush, Govt. of India, New Delhi
11	Consultancy Project on 'Preparation of State Specific Action Plan (SSAP) for Water Sector, Andaman and Nicobar Islands. (2019-2024)	**T. Subramani** Sirisha Adamala B.K. Nanda P.A. Bala I. Jaisankar Y. Gladston	20.01	Andaman & Nicobar State Water &Sanitation Mission, Sri Vijaya Puram
12	Establishment of Biotech Kisan hub (2019-2023)	**Jai Sunder** T. Sujatha D. Bhattacharya A. K. De S.K. Zamir Ahmed R.Jayakumara Varadan Z. George A. K. O. Rateesh	134.23	Department of Biotechnology, Govt. of India
13	Study on the status of minerals profile in cattle sera, its correlation with infertility and production and development of area specific mineral mixture to augment productivity. (2020-2023)	**Jai Sunder** T. Sujatha P. A. Bala	23.00	Rashtriya Krishi Vikas Yojana(RKVY), Andaman &Nicobar Islands

Sl. No.	Title	PI/CO-PIs	Budget (lakhs)	Funding Agency
14	Control of in refugia and in house invasive flies of livestock in organized and unorganized herds of South Andaman District. (2022-2024)	**D. Bhattacharya** Jai Sunder A. K. De P. Perumal T.Sujatha	11.02	(National Bank for Agriculture & Rural Development) NABARD, Sri Vijaya Puram
15	Standardization of protocol for genetic improvement of dairy cattle in Andaman and Nicobar Islands, and its linkage to the farmer's income (2022-2024)	**A. K. De** **Ashish Kumar**	11.03	(National Bank for Agriculture & Rural Development) NABARD, Sri Vijaya Puram
16	Promotion of indigenous Kadaknath chicken as backyard poultry farming in South Andaman (2022-2024)	**K. Muniswamy** T. Sujatha P. Perumal A. K. De Z. George D. Bhattacharya	10.99	(National Bank for Agriculture & Rural Development) NABARD, Sri Vijaya Puram
17	Augmentation of fertility through controlled breeding programme and artificial insemination in Goat of South Andaman (2022-2024)	**P. Perumal** A. K. De R. R. Alyethodi Jai Sunder P. A. Bala	11.03	(National Bank for Agriculture & Rural Development) NABARD, Sri Vijaya Puram
18	Economic Empowerment and nutritional security of women farmers in Andaman & Nicobar Islands through organic mushroom cultivation (2021-2024)	**N. Bommayasamy** Nitu Sindhu	29.04	Department of Science & Technology
19	Effective rainwater harvesting and utilization through lined tank technology (2021-2024)	**B.K. Nanda** Y. Ramakrishna N. Bommayasamy Pooja kapoor	10.38	(National Bank for Agriculture & Rural Development) NABARD, Sri Vijaya Puram
20	Standardization of protocol for genetic improvement of dairy cattle in Andaman and Nicobar Islands, and its linkage to the farmer's income (2022-2024)	**Arun Kumar De** Ashish Kumar	11.03	

ICAR funded

Sl. No.	Title	PI/ Co-PIs	Budget (Lakhs)
1	All India Network Project on Mariculture (2018-2025)	**R. Kiruba Sankar** J. Praveenraj K. Saravanan Chittaranjan Raul Gladston Y. Ajina SM	60.00
2	All India Network Project on Antimicrobial Resistance (AMR) in Fisheries and Livestock (Fisheries component) (2024-2026)	**K. Saravanan** J. Praveenraj Chittaranjan Raul	10.00
3	All India Network Project on Antimicrobial Resistance (AMR) in Fisheries and Livestock (Animal component) (2024-2026)	**Jai Sunder** D. Bhattacharya	10.00
4	National Extension Programme (2017-Continuing)	**P.K.Singh** Y. Ramakrishna	-
5	AICRP on Seeds (Crop)(2006- Continuing)	**P.K. Singh**	42.50
5 6	AICRP on Vegetables (2005- Continuing)	**P.K. Singh**	1.00
7	AICRP Rice (2008- Continuing)	**P. K. Singh**	-
8	AICRP Sesame & Niger (2023- Continuing)	**Prabhu P.**	0.60
9	AICRP on Palms (2015- Continuing)	**Ajit Arun Waman**	4.00
10	AICRP on Tuber crops (2010-Continuing)	**I. Jaisankar**	9.00
11	AICRP on Integrated farming system (2015- Continuing)	**T.Subramani** I. Jaisankar P. Perumal R. Kiruba Sankar Ajit A. Waman	06.99
12	National Animal Disease Control Programme on Foot and Mouth Disease (2022-2025)	**Jai Sunder** A. K. De D. Bhattacharya	8.00
13	National Animal Disease Epidemiology Network (2022-2025)	**Jai Sunder** D. Bhattacharya T. Sujatha	4.00
14	AICRP on Goat Improvement (2014- Continuing)	**Jai Sunder** R.R. Alyethodiand P. Perumal	22.00
15	Poultry Seed Project (2014- Continuing)	**T. Sujatha**	10.00

Sl. No.	Title	PI/ Co-PIs	Budget (Lakhs)
16	AICRP on Pig (2014- Continuing)	**A.K. De** **D. Bhattacharya** **P. Perumal** **Jai Sunder** **P.A. Bala**	**80.45**
17	Out scaling of natural farming through Krishi Vigyan Kendras (2022-2025)	**Y Ramakrishna** **N. Bommayasamy** B.K. Nanda Pooja Kapoor	10.65
18	National Innovation on climate resilient agriculture (2011-2025)	**Y Ramakrishna** N. Bommayasamy B.K. Nanda Pooja Kapoor	8.20

Institute funded

Sl. No.	Title	PI/ Co-PIs	Budget (Lakhs)
	Fisheries Science Division		
1	Mapping the brackish water resources of South Andaman foraquaculture site suitability using GIS approach (2022-2025)	**R. Kiruba Sankar** K. Saravanan Sirisha Adamala J. Praveenraj	20.0
2	Standardisation of high stocking density carp seed rearing in biofloc system.(2024-2025)	**Chittaranjan Raul** J. Praveenraj	37.1
3	Application of Artificial Intelligence and Internet of things in Agriculture for efficient management. (2024-2027)	**D. Karunakaran** Pooja Bohra P. Perumal Abhilash Chittaranjan Raul	55.0
4	Deciphering the *in-vitro* bioactive potential of selected seaweedspecies of Andaman Islands and evaluation of its immunomodulatory effect on fish (2022-2025)	**K. Saravanan** J. Praveenraj R. Kiruba-Sankar	39.0
5	Development of control & treatment measures for the management of parasitic diseases in freshwater fishes. (2023-2026)	**J. Praveenraj** Chittaranjan Raul Ajit Arun Waman	38.0
6	Development of Island-based information management system for decision making in agriculture. (2022-2026)	**D Karunakaran**	35.0
7	Exploration of fishery, biology and market potential of tuna resources of Minicoy Islands. (2022-2025)	**Gladston Y.** Ajina S.M, V.M Abdul Gafoor Chittaranjan Raul	84.50
8	Integrated Farming System (IFS) for enhancing sustainable Livelihood of rural tribal community of Minicoy Islands. (2022-2025)	**Ajina S.M** Gladston Y V.M. Abdul Gafoor E. B. Chakurkar	85.50
	Horticulture Crop Improvement and Protection		
9	Harnessing variability of multi-parent advance generation intercross(MAGIC) population of rice for genetic improvement (2022-2026)	**P.K. Singh** Y. Ramakrishna Pooja Kapoor	24.00
10	Introduction of sesame and safflower oilseed crops to Island conditions: Evaluating performance in the Andaman and Nicobar Islands". (2024-2027)	**P. Prabhu** P.K. Singh Abhilash	43.0

Sl. No.	Title	PI/ Co-PIs	Budget (Lakhs)
11	Collection, Conservation and Characterization of Cucurbitaceous germplasm for sustainable agriculture in the Andaman and Nicobar Islands (2024-2027)	**P. Prabhu** I. Jaisankar	36.0
12	Identification and characterization of superior germplasm of cinnamon, tejpat and long pepper under Bay Islands condition. (2021-2026)	**Ajit Arun Waman** Pooja Bohra	49.25
13	Conservation, bioprospection and utilization of selected underutilized fruit species of Bay Islands (2021-2026)	**Pooja Bohra** Ajit Arun Waman	58.24
Natural Resource Management			
15	Evaluation of Andaman Padauk (*Pterocarpus dalbergioides*) based sequential cropping system. (2022-2025)	**I. Jaisankar** B. A. Jerard T.P.Swarnam Jayakumara Varadan R. T. Subramani	31.50
16	Determining suitable cropping window and varieties in rice-maize cropping system under Island ecosystem.(2024-2027)	**Abhilash** T. Subramani P. K. Singh Subhash Nataraja Pillai	33.48
17	Synthesis of silver nanoparticles using *panchamrit*. Its characterization and evaluation of tir antibacterial activities against *Aeromonas hydrophila*ans *E.Coli.* (2024-2027)	**Talaviya H. Kumar** Jai Sunder Ajit Arun Waman Praveenraj	41.1
18	Feasibility of natural farming under tropical island ecosystem (2024-2027)	**T. Subramani** Y. Ramakrishna Talaviya H. Kumar	49.5
19	Organic farming studies for sustaining productivity of Island cropping systems (2018-2024)	**T. Subramani** Y. Ramakrishna	64.00
Animal Science Division			
20	Impact assessment of CIARI technologies on Andaman and Nicobar Islands Farmers (2024-2027)	**S. Sharath Yeligar** Y. Ramakrishna V. Damodaran, Santosh Kumar	33.32
21	Reproductive performance of cattle and goat in modern and traditional housing models in Andaman and Nicobar Islands (2024-2027)	**P. Perumal** Abhilash Sharath S. Yeligar	40.99

Sl. No.	Title	PI/ Co-PIs	Budget (Lakhs)
22	Evaluation of traditional knowledge of plants in the management of *Rhipicephalus microplus* in cattle and goat. (2022-2025)	**D. Bhattacharya** T. Sujatha Jai Sunder Arun Kr. De P. Perumal Ajit Arun Waman	25.00
23	Molecular epidemiology and vaccine development for caseous lymphadenitis in goat (2024-2027)	**A. K. De** Jai Sunder D. Bhattacharya	19.5
24	Nutrient intake and digestibility of the Andaman local and Nicobari pigs in intensive system of rearing. (2021-2024)	**P. A. Bala** Arun Kr. De P. Perumal	15.00
25	Tree fodder resources of A & N islands for its nutrient analysis and digestibility in livestock.(2023-2028)	**P. A. Bala** I. Jaisankar T. Subramani	28.2
26	Sorting of X and Y bearing spermatozoa in Rabbit Model (2023-2025)	**R.R.Alyethodi** P. Perumal	10.00
27	Evaluation of Serum levels of ERBB2, FGFR1, MAP3K19, GDF9, and IGF1R as goat fecundity biomarkers (2023-2026)	**R.R.Alyethodi** K. Muniswamy	10.00
28	Studies on the prevalence of antimicrobial resistance in bacteria of zoonotic importance in food chain and environment (2023-2026)	**Jai Sunder** A. K. De T. Sujatha D. Bhattacharya	7.50
29	Exploring the transcript variants and expression profile of germ line markers Vasa and Dazl genes in Goat.(2023-2026)	**K. Muniswamy** R. R. Alyethodi P. Perumal	21.00
30	Mitigation of heat stress of endemic poultry breeds of Andaman and Nicobar Islands under seasonal and climate change scenario (2022-2026)	**T. Sujatha** D. Bhattacharya Nivedita	15.5 1
31	Epidemiology and vaccine development of Caseous lymphadenitis in goats (2024-2027)	**Arun Kumar De** Jai Sunder D. Bhattacharya	19.5

Publications

Research Articles

Bohra, P., Waman, A.A. and Devi, R.K. (2024). Variations in horticultural characteristics in *Garcinia gummi-gutta* (L.) N. Robson: a cash crop of the humid tropics of India. *Genetic Resources and Crop Evolution*, https://doi.org/10.1007/s10722-024-02133-w (NAAS Score: 8.00)

Gupta, S., Bohra, P., Waman, A.A. and Budhwar, S. (2024). Storage Studies in Culinary Paste Prepared from Underutilized Medicinal Spice, Mango Ginger (*Curcuma mangga* Val. et Zijp.). *Current Agriculture Research Journal*, 12(3), (NAAS Score: 4.98)

Halder, N., Sunder, J., De, A.K., Bhattacharya, D. and Joardar, S.N. (2024). Probiotics in poultry: a comprehensive review. *The Journal of Basic and Applied Zoology*, 85(23),https://doi.org/10.1186/s41936-024-00379-5.

Jaisankar, I., Pradheep, K. and Prabhu, P. (2024). Exploring the potential of *Macaranganicobarica*: A sustainable alternative to plastic plates in the Andaman and Nicobar Islands. *International Journal of Agricultural Sciences*, 20(2), 427-430.DOI:10.15740/HAS/IJAS/20.2/427-430. (NAAS Score: 4.98)

Jaisankar, I., Prabhu, P., Abhilash, Jerard, B.A., Subramani, T., Chakurkar, E.B. and Arthi, N. (2024). Growth and Yield performance of *Pandanus amaryllifolius* Roxb. Accessions under Andaman Padauk plantation in Andaman and Nicobar Islands, India. *Journal of the Andaman Science Association*, 29(1), 93-100.

Jaisankar, I., Varadan, R.J., Blessy, G.M., Asokan, H.N., Mosses M.E. and Prabu, S.L. (2024). Proximate and micronutrient content of fruit, pulp and seed of *Pandanus* species. *Indian Forester*, 150(6), 531-537. DOI: 10.36808/if/2024/v150i6/169993. (NAAS Score: 4.98)

Kiruba-Sankar, R. , Shyam S. Salim, Sreepriya Prakasan, R.P. Deepitha, Harsha Haridas, K. Sarvanan, Zachariah George, S. Pushpalata, R. Raihana and Harashit Kumar roy., 2024. Livelihood assessment of women seafood vendors during pandemic restrictions in Andaman and Nicobar Archipelago, India, *Indian Journal of Fisheries,* 71(4); 124-130 https://doi.org/10.21077/ (NAAS Score: 6.5)

Kiruba-Sankar, R. and Jessica Barman., 2024. The benefits and challenges of citizen science for coastal wetland management in the Andaman and Nicobar archipelago. *Environmental Sustainability*,7,31-51. https://doi.org/10.1007/s42398-023-00296-3(NAAS Equivalent Score: 9.0)

Kiruba-Sankar, R., Haridas, H.,Saravanan, K., Deepitha, R., Sreepriya, P., Praveenraj, J. (2024). Livelihood assessment of women seafood vendors during pandemic

restrictions in Andaman and Nicobar archipelago, India. 71(4); 124-130 *Indian Journal of Fisheries* https://doi.org/10.21077/ (NAAS Equivalent Score: 6.5)

Kumar, K.V., Swathi, M., Bokade, P.P., Bharath, V., Kumari, S., Sunder, J., Hemadri, D., Shome, B.R. and Balamurugan, V. (2024). Emerging and changing pattern in prevalence ofanti-leptospiral antibodies against different serogroups in livestock in Andaman-Islands ecosystem. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences,* 94, 977-983. https://doi.org/10.1007/s40011-024-01589-1

Praveenraj, J., Uma, A., Saravanan, K., Ahilan, B.,Gopalakannan, A.,Manikandavelu, D., Kiruba-Sankar, R. and Kumar, G. (2024). Characterization of *Piscinoodinium* sp. associated with epizootics and mortality in non-native and endemic freshwater fish of the Andaman Islands, India. *Diseases of Aquatic Organisms*, 160, 19-24. (NAAS Score: 7.40).

Praveenraj, J., Roy, S., Seth, J.K., Kumari, R.M., Saravanan, K. and Kiruba-Sankar, R. (2024). Infestation of Isopod Parasites *Renocilabijui* (Crustacea: Isopoda: Cymothoidae) in Two New Host Fish Species from Andaman. *National Academy Science Letters*, https://doi.org/10.1007/s40009-024-01451-y (NAAS Score: 7.10).

Praveenraj, J., Saravanan, K., Srinath, Uma, A. and Kiruba-Sankar, R. (2024). Molecular characterization of lymphocystis disease virus in Indian glass fish: first report from the Andaman Islands. *Archives of Virology.* https://doi.org/10.1007/s00705-024-06074-8 (NAAS Score: 8.70).

Alyethodi, R.R.,Sirohi, A.S., Karthik, S., Tyagi, S., Perumal, P., Singh, U., Sharma, A., Muniswamy, K., Sunder, J. andChakurkar, E.B. (2024). Antioxidant properties of extracellular polysaccharide substances (EPS) from *Colwelliapsychrerythraea* strain 34H and its probable implications in bull semen cryopreservation. *Cryobiology*,117, 105141. https://doi.org/10.1016/j.cryobiol.2024.105141. (NAAS Score: 8.70).

Alyethodi, R.R.,Sirohi, A.S., Karthik, S., Tyagi, S.,Singh, U., Chaturvedi, S., Sharma, A., Muniswamy, K., Sunder, J. andChakurkar, E.B. (2024). Gene set enrichment analysis and cytoscape visualization of important freezability mechanisms in bull semen. *Cryobiology*, 117, 105143. https://doi.org/10.1016/j.cryobiol.2024.105143 (NAAS Score: 8.70).

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Sunder, J., De, A.K., Sujatha, T., Chakraborty, G., Mayuri, S.C., Bhattacharya, D.,Alyethodi, R.R. and Chakurkar,

E.B. (2024). Isolation and molecular characterization of *Corynebacterium pseudotuberculosis* from goats in Andaman and Nicobar Islands, India. *Microbiology Research*, 15, 2274–2285. (NAAS equivalent Score: 8.10)

Swarnam, T.P., Velmurugan, A., Jaisankar, I., Pandey, S.K., Panwar, A.S. and Ravisankar, N. (2024). The role of traditional knowledge in climate change adaptation among the Nicobarese of Central Nicobar Islands, India. *Indian Journal of Traditional Knowledge*, 23(1), 6-15. (NAAS Score: 6.80)

Swarnam, T.P., Velmurugan, A., Subramani, T., Ravisankar, N., Subash, N., Pawar, A.S.,Perumal, P., Jaisankar, I. and Dam Roy, S. (2024). Climate smart crop-livestock integrated farming as a sustainable agricultural strategy for humid tropical islands. *InternationalJournal of Agricultural Sustainability*, 22(1). https://doi.org/10.1080/14735903.2023.2298189. (NAAS Score: 9.40)

Senthamil, Pandian, C., Balamurugan, T. C., Perumal, P., Sivakumar, S. A., Sivakumar, P. and Reddy, T. J. (2024). *In vitro* gas production profile of selected stovers and cowpea hay (C-151) with fecal sample as an inoculum source. *Agricultural Mechanization in Asia, Africa and Latin America*. 55(12), 19669-19675.(NAAS Rating: 6.30)

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Waman, A.A., Bohra, P., Devi, R.K., Lokesha, A.N.andShivashankara,K.S.(2024).Stem of Woody Pepper (*Piper pendulispicum* C. DC) as a source of phenolic acids and piperine. *Indian Journal of Plant Genetic Resources*, 37(2), 294-300. https://doi.org/10.61949/0976-1926.2024.v37i02.12 (NAAS Score: 5.17)

Waman, A.A., Bohra, P., Maheswarappa, H.P., Jerard, B.A. and Sumitha, S. (2024). Culantro (*Eryngium foetidum* L.): A Profitable Intercrop in Arecanut Plantations for Diversification of Island Agriculture. *National Academy Science Letters,* https://doi.org/10.1007/s40009-024-01499-w (NAAS Score: 7.10)

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Zachariah, George., Nandi, P. R., Chakurkar, E. B., Perumal, P., De, A. K., Batabyal, S., Jai Sunder, Alyethodi, R. R., Sawhney S. and Mandal, D. (2024). Assessment of sexual maturity and testicular morphometrics in males of Andamani pigs under tropical humid island ecosystem of Andaman and Nicobar Islands. Assessment of sexual maturity and testicular morphometrics in males of Andamani pigs under tropical humid island ecosystem of Andaman and Nicobar Islands. *Journal of the Andaman Science Association*. 29(2), 172-180. (NAAS Rating: 4.15)

Popular / Technical Articles

Agricultural Drought Management in Andaman & Nicobar Islands. CIARI/ Folder/06/2024 (16/04/2024). Abhilash, T. Subramani, S. K. Zamir Ahmed, P. K. Singh, T. Sujatha, P. A. Bala, P. Perumal, Y. Ramakrishna, V. Damodaran, Santosh Kumar, T. K. Biswas (2024), Agricultural Drought Management in Andaman & Nicobar Islands. CIARI/Folder/06/2024.

Ajit Arun Waman and Pooja Bohra (2024). Can cinnamon harvesting be a new agri-start up? *Spice India* 37(3): 10-11.

Augustine, Jerard, B., Jaisankar, I. and Damodaran, V. (2024). Home scale Virgin Coconut il production. *Indian coconut Journal,* 66(7): 18-21.

Sunder, J., Saravanan, K. and Praveenraj, J. (2024). Antimicrobial Resistance (AMR) in Livestock and Fisheries. (Accessed on 22.11.2024). published in Andaman Chronicle

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Books, Book Chapters, Folders, Bulletins, Training Manuals, Proceedings, Monograph, Policy document

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Bohra, P., Waman, A.A., and E.B. Chakurkar (2024). Compendium of lectures of the workshop on sustainable plant protection strategies for Andaman and Nicobar Islands held during March 21-22, 2024 at ICAR-CIARI, Port Blair, pp. 1-78.

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Central Island Agricultural Research Institute, Port Blair, Andaman and Nicobar Islands, pp. 1- 54.

Snehil Gupta, Arun Kumar De, P. Perumal, T. Sujatha, Surbhi Gupta, and D. Bhattacharya. In Book: Neglected Zoonoses And Antimicrobial Resistance. ISBN: 978-0-443-16062-2. Cysticercosis: Matter of concern. 2024. Publisher: Mara Conner Published by Elsevier. Pg no: 55 -70.

E.B. Chakurkar, T. Sujatha, Jai Sunder. 2024. Technology Descriptors. Institute Technology Management Unit (ITMU), ICAR-Central Island Agricultural Research Institute, Port Blai,pp 103. ISBN : 978-81-957460-8-8

Manual

Jai Sunder, P. Perumal, R. R. Alyethodi, P. A. Bala, T. Sujatha, K. Muniswamy, A. K. De, D. Bhattacharya and E. B. Chakurkar (2024). Scientific Goat Farming, ICAR-CIARI, Sri Vijaya Puram, pp. 1-47.

Plant Germplasm Registered with ICAR-NBPGR, New Delhi

Name of the crop	Name of variety/ Germplasm	IC No./ INGR/year of registration	Special characters	Contributors
Pandanus amaryllifolius Roxb.	Acc. 3 Malacca; JAVJ22 Pandan	0646223/ INGR24069 /2024	The unique high foliage producing Pandan germplasm	Jaisankar I. Jerard, B.A. Pradheep K. E.B. Chakurkar T. Subramani.
Macaranga nicobarica	JPJ/18-032	0626370/ INGR24083/ 2024	Unique large sized leaf genotype	Jaisankar I. Jerard, B.A. Pradheep K. Nissar V.A.M. John K.J.

NBPGR Gene bank IC numbers for plant germplasm

Crop	Scientific name	IC number	Contributors
Cinnamon	*Cinnamomum verum*	IC653472, IC653473, IC653474, IC653475, IC653476, IC653477, IC653478, IC653479, IC653480, IC653481, IC653482, IC653483, IC653484, IC653485, IC653486, IC653487, IC653488, IC653489, IC653490, IC653491, IC653492, IC653493, IC653494, IC653495	Ajit Arun Waman Pooja Bohra
Tejpat	*Cinnamomum tamala*	IC653496, IC653497, IC653498, IC653499, IC653500, IC653501	

Crop	Scientific name	IC number	Contributors
Taro	*Colocasia esculenta*	IC653033, IC653034, IC653035, IC653036, IC653037, IC653038, IC653039, IC653040, IC653041, IC653042, IC653043, IC653044, IC653045, IC653046, IC653047, IC653048, IC653049, IC653050, IC653051	B.A. Jerard V. Damodaran I. Jaisankar M. Sankaran

GenBank Accession numbers

Bacteria and origin	Target gene	Accession number	Authors
E. coli (goat)	*blaTEM-Type*	PP498842	Jai Sunder I. Samanta T. Sujatha A.K. De D.Bhattacharya S. Bandyopadhyay A. Mukherjee
E. coli (pig)	*blaTEM-Type*	PP498843	
*E. coli (*cattle)	*blaTEM-Type*	PP498844	
Salmonella (goat)	*blaTEM-Type*	PP498845	
Salmonella (pig)	*blaTEM-Type*	PP498846	
Salmonella (cattle)	*blaTEM-Type*	PP498847	
K. pneumoniae (goat)	*blaTEM-Type*	PP498848	
K. pneumoniae (pig)	*blaTEM-Type*	PP498849	
E. coli (pig)	*blaCTX-M Type*	PP654857	
E. coli (cattle)	*blaCTX-M Type*	PP654858	
K. pneumoniae (pig)	*blaCTX-M Type*	PP654859	
K. pneumoniae (cat-tle)	*blaCTX-M Type*	PP654860	
Salmonella (goat)	*blaCTX-M Type*	PP654861	
Salmonella (goat)	*blaCTX-M Type*	PP654862	
K. pneumoniae (cat-tle)	*blaSHV-Type*	PP579927	
K. pneumoniae (goat)	*blaSHV-Type*	PP579924	
K. pneumoniae (goat)	*blaSHV-Type*	PP579925	
K. pneumoniae (pig)	*blaSHV-Type*	PP579926	
E. coli (goat)	*blaAmpc*	PP449024	
E. coli (cattle)	*blaAmpc*	PP449025	
Salmonella (goat)	*blaAmpc*	PP449026	
Salmonella (pig)	*blaAmpc*	PP449027	
Salmonella (cattle)	*blaAmpc*	PP449028	
K. pneumoniae (goat)	*blaAmpc*	PP449029	
K. pneumoniae (pig)	*blaAmpc*	PP449030	
K. pneumoniae (cat-tle)	*blaAmpc*	PP449031	

Bacteria and origin	Target gene	Accession number	Authors
E. coli (goat)	*sdi*	PP336432	Jai Sunder I. Samanta T. Sujatha A.K. De D.Bhattacharya S. Bandyopadhyay A. Mukherjee
E. coli (pig)	*sdi*	PP336433	
*E. coli (*cattle)	*sdi*	PP336434	
Salmonella (goat)	*sdi*	PP336435	
Salmonella (pig)	*sdi*	PP336436	
Salmonella (cattle)	*sdi*	PP336437	
K. pneumoniae (goat)	*sdi*	PP336438	
K. pneumoniae (pig)	*sdi*	PP336439	
K. pneumoniae (cat-tle)	*sdi*	PP336440	
E. coli (goat)	*CsgA*	PP317124	
E. coli (pig)	*CsgA*	PP317125	
*E. coli (*cattle)	*CsgA*	PP317126	
Salmonella (goat)	*CsgA*	PP317127	
Salmonella (pig)	*CsgA*	PP317128	
Salmonella (cattle)	*CsgA*	PP317129	
K. pneumoniae (goat)	*CsgA*	PP317130	
K. pneumoniae (pig)	*CsgA*	PP317131	
Corynebacterium pseudotuberculosis	*16S rRNA*	PP348281	A.K. De Jai Sunder D.Bhattacharya T.Sujatha
Corynebacterium pseudotuberculosis	*rpoB*	PP355999 PP356000	

Any other

Kiruba-Sankar, R., Saravanan, K., Praveenraj, J., Eswaran, Y. and Soratur, A. (2024). Release of a Hawksbill turtle caught live in a ghost net - an outcome of citizen science initiatives at Car Nicobar, Andaman and Nicobar archipelago. *Indian Ocean Turtle Newsletter*, No. 40, pp. 8-10.

Participation of scientist in conferences/ seminars/ symposia/ meetings

Scientist	Programme	Organizer	Date
I. Jaisankar	International Webinar on 'Functional Phenomics for Improved Climate Resilience in Tropical Agriculture'	ICAR-CTCRI, Thiruvananthapuram	04/01/2024
I. Jaisankar	Meeting of UT of A&N Islands Expert Appraisal committee (UTEAC)	UT Administration, Port Blair	12/01/2024
J. Praveenraj	Advances in fish systematics: morphological and molecular approaches	ZSI, Kolkata	18/01/2024 to 19/01/2024
I. Jaisankar	Project review meeting of the project on Regeneration and molecular characterization of Andaman Padauk (*Pterocarpus dalbergioides*)	DBT, New Delhi	23/01/2024
T. Subramani	Annual group meeting of AICRP-Integrated Farming System	ICAR-IIFSR, Modipuram	29/01/2024 to 31/01/2024
Prabhu P.	3rdIndian Horticulture Summit-cum-International Conference-2024	RARI, Jaipur	01/02/2024 to 03/02/2024
P. K. Singh	Scientific Advisory Committee (SAC) Meeting of KrishiVigyan Kendra of ICAR-CIARI, Port Blair	ATARI, Kolkata	10/02/2024
T. Subramani	National Conference on "Nurturing Agricultural Advancement and Sustainability 2024	Society of Agriculture Research and Social Development (New Delhi)	10/02/2024 to 11/02/2024
T. Sujatha	SRIJAN: Empowering ZTMCs/ ITMUs of ICAR Institutes' during	ZTMU, ICAR, New Delhi	13/02/2024 to 15/02/2024

Scientist	Programme	Organizer	Date
P. K. Singh	60th Technical Committee meeting of HVADA	Directorate of Agriculture, Haddo, Port Blair	14/02/2024
	Institute Germplasm Identification Committee (IGIC	ICAR-CIARI, Port Blair	19/02/2024
	42nd Annual Group Meeting of AICRP (VC)	ANDUA&T, Ayodhya	22/02/2024 to 24/02/2024
Ajit Arun Waman	National Horticulture Fair-2024	Society for Promotion of Horticulture and ICAR-IIHR, Bengaluru	05/03/2024 to 07/03/2024
P.K. Singh	Meeting for Fixation of scale of finance for 2024-25	Directorate of Agriculture, Haddo, Port Blair	12/03/2024
R.R.Alyethodi	21st Annual Review Meeting (ARM) of AICRP on Goat Improvement	ICAR-CIRG, Makhdoom	18/03/2024
T. Sujatha, Abhilash I. Jaisankar Ajit Arun Waman Prabhu P. K. Saravanan	Workshop on Sustainable plant protection strategies for Andaman & Nicobar Islands (SPPS 2024)	Andaman Science Association& ICAR-CIARI, Port Blair	21/03/2024 to 22/03/2024
T. Subramani	Review meeting of State Specific Action Plan on Water in A & N Islands	National Water Mission, New Delhi	26./03/2024
J. Praveenraj	IUCN Freshwater Fish Red Listing Workshop (Virtual)	IUCN, Switzerland	27/03/2024
I. Jaisankar	Quality Planting Material Production Project Review Meeting	ICAR-CAFRI, Jhansi	17/04/2024
Prabhu P.	39th Annual Group Meeting of AICRP Seeds (Crops)	UAS, Bengaluru	02/05/2024 to 03/05/2024
Arun Kumar De	Annual Review meeting (2022-23) for AICRP on Pig from	ICAR-NRC on Pig, Guwahati	24/04/2024 to 26/04/2024

Scientist	Programme	Organizer	Date
P.K. Singh R.R.Alyethodi Jai Sunder Prabhu P. Pooja Bohra Ajit Arun Waman	Round Table Discussion on Climate Resilient Agriculture Technologies for Islands	DST-TIFAC, New Delhi & ICAR-CIARI, Port Blair	15/05/2024
K. Saravanan Jai Sunder	Launch Workshop of All India Network Programme on Antimicrobial Resistance (AINP-AMR) for Fisheries and Livestock	ICAR-NBFGR, Lucknow	22/05/2024
T. Subramani	State Level Steering Committee meeting (SSAP project) meeting	Secretariat, UT Administration	24/05/2024
Ajit Arun Waman	Annual Review Meeting of CSS-MIDH (NHM) Project	Sher-e-Kashmir University of Agricultural Science and Technology, Shalimar, Srinagar	09/06/2024 to 10.06.2024
Dr. Arun Kumar De	International Web Conference on innovative and current advances in agriculture and allied sciences	ICAAS	15/06/2024 to 20/06/2024
Jai Sunder	Annual Review Meeting of FMD centres	ICAR-NIFMD, Bhubaneswar	18/06/2024 to 19/06/2024
P.K. Singh	Regional Advisory Group Meeting for final sizing Unit Cost for various activities under agriculture and allied activities for the year 2024-25	NABARD, RO, Port Blair	19/06/2024
I. Jaisankar	24th Annual Group meeting of AICRP on Tuber Crops	NAU,Navsari, Gujarat	25/06/2024 to 27/06/2024
K. Saravanan	Meeting for third party evaluation of Scheduled Tribe Component (STC/ TSP)	Horticulture SMD, ICAR	27/06/2024
Jai Sunder	Annual review meeting of NADEN Project	ICAR-NIVEDI, Bengaluru	08/07/2024
Jai Sunder K. Saravanan	Virtual training programme on “Use of FAO Assessment Tool for Laboratories and AMR Surveillance Systems (FAO-ATLASS)”	Food and Agriculture Organization (FAO)	19/07/2024

Scientist	Programme	Organizer	Date
R.R Alyethodi	"*Cryo2024*"- International conference on "Engineering Cryobiology for Life and Sustainability" (Virtual)	Society for Cryobiology, Washington DC	23/07/2024 to 25/07/2024
Ajit Arun Waman	Van Mahotsav programme	BSI, ANRC, Port Blair	26/07/2024
D. Karunakaran Abhilash	1st International Conference on "Computational Intelligence for Security, Communication and Sustainable Development	Dr. B. R. Ambedkar Institute of Technology, Port Blair	05/08/2024 to 06/08/2024
Talaviya H.	16th annual workshop of DA&FW sponsored, Monitoring of Pesticide Residues at National Level (MPRNL) project	AINP on Pesticide Residues ICAR- IARI, New Delhi	08/08/2024
Jai Sunder P.K. Singh Prabhu P.	State-level workshop-cum-seminar on 'Scope and challenges of Natural Farming	Department of Agriculture, A&N Administration & ICAR-CIARI, Sri VIjaya Puram	13/08/2024
Ajit Arun Waman	33rd Annual review meeting of AICRP on Palms Project	Bihar Agricultural University, Sabour	21/08/2024 to 23/08/2024
R. Kiruba Sankar	Annual review meeting of the DST-funded project on the development of STI hub in Car Nicobar	ICAR - CMFRI and DST	31/08/2024
K. Saravanan	Virtual demonstration programme for WHONET software	ICAR-NBFGR, Lucknow	12/09/2024
Arun Kumar De	Annual Review meeting (2023-24) for AICRP on Pig from	ICAR-CCARI, Goa	19/09/2024 to 20/09/2024
Ajit Arun Waman P.K. Singh	Editor's workshop on 'Enabling a Research Ecosystem' (Virtual)	Elsevier Publications	24/09/2024
Ajit Arun Waman	61st meeting of Technical Committee of High Value Agriculture Development Agency (HVADA)	Directorate of Agriculture, Sri Vijaya Puram	27/09/2024
P.K. Singh	Virtualworkshop of IARI-SAUs/ ICAR Institutes Collaborative National Extension Programme and IARI-VOs Partnership Programme	ICAR-IARI, New Delhi	07/10/2024

Scientist	Programme	Organizer	Date
R.R.Alyethodi	22nd Annual Review Meeting of AICRP on Goat Improvement	CSK Himachal Pradesh Agricultural University, Palampur (HP)	15/10/2024 to 16/10/2024
J. Praveenraj	Antimicrobial Susceptibility Testing and WHONET software for data management of Antimicrobial Resistance (AMR)	ICAR-NBFGR, Lucknow	15/10/2024 to 17/10/2024
Talaviya H.	National Seminar on Medicinal and Aromatic Plants of Health and Wealth	Medicinal and Aromatic Plants Association of India & ICAR-DMAPR, Anand	22/10/2024 to 23/10/2024
K. Saravanan	Review meeting of National Surveillance Programme for Aquatic Animal Diseases project	DDG (Fisheries), ICAR HQ, New Delhi	13/11/2024
R. KirubaSankar	Investment meet on fisheries and aquaculture sector in Andaman and Nicobar Islands.	Department of Fisheries, GoI	14/11/2024
T. Subramani	Global Soil Conference 2024, NASC, New Delhi	Indian Society of Soil Science, New Delhi	19/11/2024 to 22/11/2024
Gladston Y. Ajina S.M. Prabhu P. R.R. Alyethodi	National virtual IP awareness programme. Lab to Market: Leveraging IP	ICAR-CIARI, Sri Vijaya Puram	25/11/2024
Jai Sunder	Coordination meeting on AIDS control	Andaman& Nicobar AIDS Control Society, A & N Islands	29/11/2024
Abhilash	Biennial Workshop of "All India Co-ordinated Research Project on Integrated Farming Systems (AICRP-IFS)"	Punjab Agricultural University, Ludhiana.	02/12/2024 to 05/12/2024
Raj Narayan	International Conference "Aushadh Manakam-2024," on Ayurvedic Drug Standardization: Challenges & Solutions	Dr. SRRAU, Jodhpur	05/12/2024 to 07/12/2024
Dr. Arun Kumar De	Online: International Conference in Global Research Initiatives for Sustainable Agriculture & Allied Sciences	SKNAU-RARI, Rajasthan	10/12/2024 to 12/12/2024

Scientist	Programme	Organizer	Date
I. Jaisankar	AICRP on Tuber crops QRT meeting at ICAR- CTCRI, Regional Station, Bubhaneshwar	ICAR-Central Tuber Crops Research Institute, Sreekariyam, Thiruvananthapuram, Kerala	16/12/2024 to 17/12/2024

HRD (Training attended)

Category: Scientific staff

Sl. No	Scientist & Designation	Program	Organizer	Date	Mode
1.	P. K. Singh Pr. Scientist & Head	Training on Recent Advances in Data Analysis and Applications	ICAR-IASRI, New Delhi	16/01/2024 to 22/01/2024	Offline
2.	J.Praveenraj Scientist (SS)	Training on Advances in fish systematics: morphological and molecular approaches	ZSI, Kolkata	18/01/2024 to 19/01/2024	Offline
3.	Talaviya H.K. Scientist	Training on Laboratory Quality Management System & Internet Audit as per IS/ISO/ISE 17025;2017	BIS-NITS, Noida, UP	09/07/2024 to 12/07/2024	Offline
4.	K. Saravanan Senior Scientist	Training on Use of FAO Assessment Tool for Laboratories and AMR Surveillance Systems (FAO-ATLASS)	Food and Agriculture Organization (FAO)	19/07/2024	Online
5.	Abhilash Scientist	Training on Remote Sensing and GIS Applications in Agricultural Water Management	Indian Institute of Remote Sensing-Indian Space Research Organization, Department of Space, Dehradun	21/09/2024 to 18/09/2024	Offline
6.	Gladston Y. Scientist (SS)	Training on Ecosystem modeling and ecosystem service analysis in coastal ecology	ICAR-Central Coastal Agricultural Research Institute-Goa	14/10/2024 to 18/09/2024	Online
7.	Ajina S M, Scientist (SS)		ICAR-Central Coastal Agricultural Research Institute-Goa	14/10/2024 to 18/09/2024	Online

Sl. No	Scientist & Designation	Program	Organizer	Date	Mode
8.	J.Praveenraj Scientist (SS)	Training on Antimicrobial Susceptibility Testing and WHONET software for data management of Antimicrobial Resistance (AMR)	ICAR-NBFGR, Lucknow	15/10/2024 to 17/10/2024	Offline
9.	Jai Sunder Pr. Scientist & Head		ICAR-NBFGR, Lucknow in collaboration with FAO		Offline
10.	K.Saravanan Senior Scientist	Demonstration programme for WHONET software	ICAR-NBFGR, Lucknow	12/11/2024	Online
11.	V. Damodaran Sr. Scientist & Head	Training on Management Development Program for Newly Recruited Sr. Scientists & Heads of KVKs	ICAR-NAARM, Hyderabad	27/11/2024 to 31/12/2024	Offline
12.	Santosh Kumar Sr. Scientist & Head	Training on Management Development Program for Newly Recruited Sr. Scientists & Heads of KVKs	ICAR-NAARM, Hyderabad		Offline

Category: Technical Staff

Sl. No	Name	Programme	Organizer	Date	Mode
1.	Asma Bibi	Training on E-Goverence tools and its applications in ICAR	ICAR-Indian Agricultural Statistics Research Institute, Pusa, New Delhi	08/02/2024 to 14/02/2024	Online
2.	Er. Manoj Kumar	International agriculture certificate course-cum-training program on Prime Minister & Ministry Of Agriculture & Farmers' Welfare Sponsored Agriculture Scheme & Indian Agriculture Vision- 2050	Hindustan Agricultural Research Welfare Society	01/04/2024 to 30/04/2024	Hybrid

Sl. No	Name	Programme	Organizer	Date	Mode
3.	Naga Venkat Laxmi Nutan Roy Alex Praveen Bala Abbu Bakkar T. Ravi Shivani Kumari Brajesh Kumar Abhishek Kumar Ujjawal Kumar	Scientific management practices to enhance rural poultry & native duck production	ICAR-CIARI, Sri Vijaya Puram	07/07/2024 to 30/04/2024	Offline
3.	Deep Kumar Mukherjee Naga Venkat Laxmi Nutan Roy Shivani Kumari Brajesh Kumar Abhishek Kumar Shri. Ujjawal Kumar	Scientific nursery techniques for tropical spices	ICAR-CIARI, Sri Vijaya Puram	09/09/2024 to 11/09/2024	Offline

Category: SSS

Sl. No	Name	Program	Organizer	Date	Mode
1.	Y. Vijay Rao G. Soren Mahadev Mondal BVB Swamy Thirupathi Rao N. Chokkalingam Kashinathan C.H Sampat Rao Jettu Lohar GDPT Rao	Training on computer literacy	AKMU-ICAR-CIARI, Sri Vijaya Puram	19/08/2024 to 23/08/2024	Offline
2.	Zakir Hussain N. Gopinathan Pebiynus Minj D. Thanga Pandiammal Surender Singh	Training on Scientific nursery techniques for tropical spices	ICAR-CIARI, Sri Vijaya Puram	09/09/2024 to 11/09/2024	Offline

Training and capacity building programme conducted

a) Training to stakeholders

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
1	Training program on freshwater ornamental fish culture for entrepreneurship development	10/01/2024 to 12/01/2024	8/12/20	Farmers	ICAR-CIARI	J. Praveenraj K. Saravanan R.K. Sankar
2	Three days exposure visit cum training programme on 'Quality Seed and Planting Material in Agri-horticultural Crops for Nicobarese Tribal Farmers	07/02/2024 to 09/02/2024	7/4/11	Tribal Farmers	ICAR-CIARI	P.K Singh, Pooja Bohra Ajit A Waman
3	Three days training programme on Appropriate cultivation and postharvest practices for producing quality spices in the plantation crops based cropping systems'	19/02/2024 to 21/02/2024	13/5/18	Tribal Farmers	ICAR-CIARI	Ajit A. Waman Santosh K. Pooja Bohra P.K. Singh

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
4	Awareness training on integrated farming and input distribution under STC at Kavartti, Amini and Kadmat	19/02/2024 to 24/02/2024	48/33/81	Tribal Participants	KVK Kavaratti, DoF Amini, DoF Kadmat.	Ajina S.M. Gladston Y. S.K. Zamir Ahmed E B Chakurkar
5	Training program on freshwater ornamental fish culture for entrepreneurship development for Nicobarese youth	23/02/2024 to 25/02.2024	20/29/49	Students	ICAR-CIARI	J. Praveenraj K. Saravanan R. Kiruba Sankar D Karunakaran Chittaranjan Raul
6	Awareness training on Responsible fisheries and input distribution under STC	22/02/2024 to 24/02/2024	48/35/83	Tribal Participants	KVK Kavaratti, DoF Amini, DoF Kadmat	Ajina S.M. Gladston Y. S.K. Zamir Ahmed E B Chakurkar
7	Orientation training program on Exposure and knowledge development in the Island fisheries sector for the staff of the Department of Fisheries, Kerala	26/02/2024 to 28/02/2024	2/3/5	Officials from the Department of Fisheries, Kerala	ICAR-CIARI	K. Saravanan, J. Praveenraj D. Karunakaran, R. Kiruba Sankar

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
8	Awareness on world intellectual property day, 2024, IP & SDGs: Building our common future with innovation and creativity	26/04/2024	55/0/55	Scientist	ICAR-CIARI	T. Sujatha
9	Round table discussion on "Climate Resilient Agriculture technologies for islands	15/05/2024	58/0/58	Scientists and farmers	ICAR-CIARI	
10	Controlled breeding programme and artificial insemination in goat	20/05/2024 to 24/05/2024	13/12/25	Goat farmers	Birdline, South Andaman	P. Perumal R. R. Alyethodi S.S. Yeligar Jai Sunder
11	Management of paddy crop in rainfed lowland conditions	15/07/2024	20/4/24	Farmers and KVK Official	ICAR-KVK, N&M Andaman	P.K. Singh, V. Damodaran Y. Ramakrishna Rakesh Dawar Shyam S Rao
12	Management of paddy crop for seed production in Islands	18/07/2024	20/4/24	Farmers	Keralapuram North Andaman	
13	Controlled breeding programme and artificial insemination in goat	23/07/2024 to 27/07/2024	15/10/25	Goat farmers	New Bimlitan, South Andaman	P. Perumal, R.R. Alyethodi S.S. Yeligar Jai Sunder

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
14	Sensitization programme on livelihood augmentation through diversification of fishing technologies & Input Distribution under STC at Minicoy	29/07/2024 to 31/07/2024	22/1/23	Fishermen population	ICAR-CIARI, RS Minicoy	Gladston Y. Ajina S.M. S. Hassan R. Kiruba Sankar
15	Technology know how Training programme for technical staff	07.08.2024 to 09.08.2024	09/0/09	Technical staff		T. Sujatha R.Kiruba Sankar
16	Computer Literacy for Skilled Supporting Staff	19/08/2024 to 23/08/2024	21/1/22	Skilled Supporting Staff	ICAR-CIARI	D. Karunakaran Asma Bibi
17	Scientific Nursery Techniques in Tropical Spice	09/09/2024 to 11/09/2024	11/19/30	Institute staff, farmers and educated youth	ICAR-CIARI	Ajit A Waman Pooja Bohra
18	Skill Development Training on Scientific backyard poultry farming for rural livelihood	24/09/2024 to 28/09/2024	50/50/100	Poultry and Goat farmers	ICAR-KVK, N&M Andaman	T. Sujatha V. Damodaran Subam D. Yatharth S. Rakesh Dawar S.S. Yeligar

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
19	Scientific Cultivation of Sesame: A Potential Oilseed Crop for Island Conditions	16/10/2024	15/1/16	Farmers and KVK Official	ICAR-KVK, N&M Andaman	P.K Singh Prabhu P. V. Damodaran Rakesh Dawar Shyam S. Rao
20	Scientific Cultivation of Sesame: A Potential Oilseed Crop for Island Conditions	19/10/2024	24/3/27	Farmers	Keralapuram North Andaman	
21	Job training of Technician on Poultry management including incubator and hatchery operation	11/10/2024 to 21/10/2024	3/3/6	Technical staff	ICAR-CIARI	T. Sujatha
22	Customized training on Scientific goat farming	ICAR-CIARI Sri Vijaya Puram	4/3/7	Progressive farmers and educated Youth/ Entrepreneurs	ICAR-CIARI	Jai Sunder R.R Alyethodi P. Perumal, P.A. Bala
23	Organic Tuber Crops Cultivation and Value Addition for Sustainability	21/10/2024 to 23/10/2024	15/20/35	Farmers	Shantipur, Swadesh Nagar	I. Jaisankar, V. Damodaran Yatharth S. Subam D. Rakesh Dawar

Sl. No	Training	Date	Participants M/F/T	Type of Participants	Venue	Coordinators
24	National Intellectual Property Festival: Nurturing ideas to Innovation; Lab to Market: Leveraging IP under National IPR Awarness Mission (NIPAM 2.0)	25.11.2024	103/0/103	Scientists, students and staff of CIARI	ICAR-CIARI	T. Sujatha Nitin Tewari, CSIR-Chemical Laboratory
25	Awareness programme on technology demonstration on the eve of Agriculture Education Day	3.12.2024	240/0/240	Students	ICAR-CIARI	T. Sujatha Karunakaran
26	Virtual Meeting on Intellectual Property rights and their role in development	03.12.2024	6/0/6	All Scientists	ICAR-CIARI	T. Sujatha ZTMU, IIVR, Varanasi
27	Customized Training Programme on Scientific Goat farming	02/12/2024 to 06/12/2024	3/4/7	Goat farmers	ICAR-CIARI, Sri Vijaya Puram	P. Perumal R.R. Alyethodi Jai Sunder
28	Scientific livestock and poultry production	19/12/2024 to 20/12/2024	80/66/146	Farmers	Webi, bakultala, karmatang	A.K. De P. Perumal
29	Scientific Pig Farming for Rural Livelihoods and Food Security in A & N Islands	18/12/2024 to 21/12/2024	95/108/203	Farmers	North and Middle Andaman	

Total Beneficiaries: 1458 (Male 1028 & Female 430)

b) Field day

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
1	Tuber Crops Diversity Fair	08/02/2024 to 09/02/2024	59/29/81	ICAR-KVK, South Andaman	I. Jaisankar T. Subraman Y. Ramakrishna Tamai Paul
2	Field day on Sequential cropping system for improving productivity and livelihood security	23/02/2024	17/13/30	ICAR-CIARI	
3	Technology Demonstration on Herbal Acaricide	01/03/2024	27/21/48	Nimbudera	Jai Sunder R.R. Alyethodi P. Perumal
4	Field Demonstration on the use of FAMACHA card in general health management of goats	01/03/2024	27/21/48	Nimbudera	
5	Technology Demonstration on Herbal Acaricide	02/03/2024	25/8/33	Baratang	
6	Field Demonstration on the use of FAMACHA card in general health management of goats	02/03/2024	25/8/33	Baratang	
7	Controlled breeding programme and artificial insemination in goat	10/06/2024	12/13/25	New Wandoor	P. Perumal RR. Alyethodi S.S. Yeligar Jai Sunder
8	Controlled breeding programme and artificial insemination in goat	11/06/2024	10/15/25	Indira Nagar	
9	Field day on Tuber crops diversity and Scientific Tuber crops cultivation for improving the food security	20/11/2024	16/10/26	ICAR-CIARI	I. Jaisankar T. Subraman, Y. Ramakrishna Sushma Mohit Tamai Paul
10	Controlled breeding programme and artificial insemination in goat	30/11/2024	20/05/25	Baratang	P. Perumal P.A. Bala

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
11	Field Day-Pearl Millet Cultivation under coconut plantation	30/12/2024	26/05/31	ICAR-CIARI RS Minicoy	Gladston Y. Ajina S.M. S. Hassan Arif M.I. S.K. Zamir Ahmed E.B. Chakurkar
12	Field day on "Scientific Pig production"	03/02/2024	17/20/37	Chauldari, South Andaman	Arun Kumar De
13	Field day on "Castration of piglets"	06/03/2024	11/16/27	Guptapara, South Andaman	
14	Field day on "Castration of piglets"	07/03/2024	8/10/18	Wandoor, South Andaman	

Total Beneficiaries: 505 (Male 300 & Female 202)

c) Interaction Meet

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
1	Fisher Interaction meet on fish aggregating device	10/02/2024	24/0/24	ICAR-CIARI, RS Minicoy	Gladston Y. Ajina S.M. S. Hassan S.K. Zamir Ahmed
2	Fisher Scientist Interaction meet	29/11/2024	7/0/7	ICAR-CIARI, RS Minicoy	

Total Beneficiaries: 31 (Male 31 & Female 00)

d) Field Demonstration

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
1	Demonstration on pheromone traps	19/02/2024 to 24/02/ 2024	48/33/81	Kavaratti, Kadmat and Amini Islands	Gladston Y. Ajina S.M. S. Hassan Arif M.I. S.K. Zamir Ahmed E.B. Chakurkar

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
2	Demonstration cum input distribution to promote small-scale fishing activities of tribal fishers	21/05/2024	7/7/14	Harminder Bay, Little Andaman	K. Saravanan J. Praveenraj R.K. Sankar
3	Demonstration IFS system	24/08/2024	25/10/35	RS Minicoy	Gladston Y. Ajina S.M. S. Hassan Arif M.I. S.K. Zamir Ahmed E.B. Chakurkar
4	Awareness cum demonstration programme on the use of CIFA-Brood-Vac vaccine in fish farming	04/12/2024	40/30/70	ICAR-CIARI, Sri Vijaya Puram	Mrinal Samanta Y. Ramakrishna K. Saravanan J. Praveenraj Chittaranjan Raul Pooja Kapoor Sushma Thanmai Paul
5	Controlled breeding programme and artificial insemination in goat	10/12/2024	10/15/25	Shaheed Dweep	P. Perumal P.A. Bala
6	Controlled breeding programme and artificial insemination in goat	19/12/2024	30/30/60	Bakultala, N and M Andaman	P. Perumal A.K. De
7	Controlled breeding programme and artificial insemination in goat	20/12/2024	50/36/86	Karmatang, N and M Andaman	P. Perumal A.K. De
8	Controlled breeding programme and artificial insemination in goat	21/12/2024	30/18/48	Nimbudera , N and M Andaman	
9	Field demonstration on “Demorning of livestock”	28/02/2024	25/46/71	Kamorta, Nicobar	A.K. De
10	Field Demonstration on “Oral iron supplementation in piglets to control IDA”	29/02/2024	20/45/45	Chota Enaka, Nicobar	
11	Field Demonstration ‘Iron supplementation for control of IDA in piglets’	25/11/2024	45/60/105	Harbinder bay	

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
12	Field Demonstration on 'Probiotics supplementation for combating weaning stress in piglets'	23/08/2024	18/7/25	Car Nicobar	A.K. De P.A. Bala

Total Beneficiaries: 685 (Male 348 & Female 337)

e) Workshop

Sl. No	Title	Date	Participants M/F/T	Type of participants	Venue	Coordinators
1	Workshop on NICMIS an ICT tool for the Nicobarese youths	24/02/2024	20/14/34	Nicobarese youths	ICAR-CIARI	R. Kiruba Sankar K. Saravanan, J. Praveenraj D. Karunakaran Chittaranjan Raul
2	Workshop on 'Sustainable Plant Protection Strategies for Andaman and Nicobar Islands (SPPS-2024)'	21/03/2024 to 22/03/2024	114/0/114	Officials from line departments, farmers and researchers	ICAR-CIARI	Pooja Bohra P.K.Singh E.B. Chakurkar
3	Workshop on Rejuvenating Inner Strength	20/08/2024	40/20/60	All the staff of ICAR-CIARI	ICAR-CIARI	D. Bhattacharya K. Saravanan Shyam S Rao Prakash Mondal

Total Beneficiaries: 208 (Male 174 & Female 34)

f) Webinar/Seminar/Meetings

Sl. No	Title	Date	Participants M/F/T	Type of participants	Venue	Coordinators
1	Mangrove Drive, at Minicoy, Lakshadweep	05/06/2024	14/01/15	Scientific team of ICAR-CIARI RS Minicoy	Marsh land of Minicoy Islands	Gladston Y. Ajina S.M. S. Hassan Arif M.I. S.K. Zamir Ahmed E.B. Chakurkar
2	Plantation drive	05/06/2024	14/02/16	Scientific team of ICAR-CIARI RS Minicoy	Experimental farming	
3	10th International Day of Yoga	21/06/2024	30/11/41	Employees of ICAR-CIARI	ICAR-CIARI	P.K. Singh K. Saravanan Shyam Rao A.K. Tripathi Alex P. Barla P. Simhachalam

Total Beneficiaries: 72 (Male 58 & Female 14)

g) Awareness campaigns

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
1	Agromet Advisory Services for Planning Agricultural Activities	20/02/2024	17/8/25	South Andaman	Abhilash, T. Harshan K. T. Subramani
2	Capacity Building programe on Scientific Goat Farming	01/03/2024	27/21/48	Nimbudera	P. Perumal RR. Alyethodi Jai Sunder
3	Capacity Building programe on Scientific Goat Farming	02/03/2024	25/8/33	Baratang	
4	Biological and Immnunoloical control of flies in Livestock cum distribution of immnologial kits for licestck	05/03/2024	10/6/16	ICAR-KVK, South Andaman	T. Sujatha D. Bhattacharya Jai Sunder
5	Awareness and promotion of weather based Agromet Advisories	19/03/2024 to 20/03/2024	150/60/210	Nicobar	Abhilash T. Subramani Santosh Kumar T.K. Biswas

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
6	Weather based planning for farm and fish management during monsoon season	17/05/2024	20/7/27	Shaheed Dweep, South Andaman	Abhilash Chittaranjan Raul T.K. Biswas
7	Awareness Programme on National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)	20/05/2024	27/0/27	R.K. Pur, Little Andaman	R. Kiruba Sankar K. Saravanan J. Praveenraj
8	International Yoga Day 2024	21/06/2024	14/2/16	RS Minicoy	Gladston Y. Ajina S.M.
9	Awareness Programme on National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)	19/07/2024	16/04/20	Shoal Bay, South Andaman	R. Kiruba Sankar K. Saravanan, J. Praveenraj Chittaranjan Raul
10	Awareness Programme on Yogic, Ancient and Traditional Science for Healthy Living - Prevention of Diseases, Stress and Pain Management	21/08/2024	40/20/60	ICAR-CIARI, Sri Vijaya Puram	D. Bhattacharya K. Saravanan Shyam S Rao Prakash Mondal
11	Prevention and Control of Foot & Mouth Disease in Livestock	13/09/2024	25/10/35	Calicut Village, South Andaman	Jai Sunder A.K. De D. Bhattacharya T. Sujatha R.R. Alyethodi
12	Awareness on “Scientific goat farming”	10/09/2024	14/11/25	Rangachang	Jai Sunder A.K. De D. Bhattacharya T. Sujatha R.R. Alyethodi K. Muniswamy
13	Awareness on FMD	13/09/2024	10/8/18	Calicut Village	Jai Sunder, R R Alyethodi
14	Awareness on Goat farming	17/09/2024	25/0/25	Rangachang	Jai Sunder R.R. Alyethodi
15	Awareness programme on Bioprospection of native horticultural crops of the islands	28/10/2024	24/52/76	ICAR-CIARI	Ajit A. Waman

Sl. No	Title	Date	Participants M/F/T	Venue	Coordinators
16	Vigilance Awareness week -2024	28/10/2024 to 03/11/2024	100/95/195	ICAR-CIARI & Chouldhari village	T. Sujatha Kanishk Bhukar S.S. Yeligar Prabhu P. Y. Ramakrishna, Shyam S. Rao
17	Awareness Programme on National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)	29/10/2024	13/06/19	Collinpur, South Andaman	R. Kiruba Sankar K. Saravanan J. Praveenraj Chittaranjan Raul
18	Awareness Programme on Antimicrobial Resistance (AMR) in the context of One Health	22/11/2024	20/14/34	Wandoor, South Andaman	Jai Sunder, K. Saravanan, J. Praveenraj Y. Ramakrishna
19	Awareness campaign on Rashtriya Jantatiya Divas and World Fisheries Day 2024	22/11/2024 to 23/11/2024	28/2/30	Car Nicobar	R. Kiruba Sankar Tasneem Kauser Lucinda Meshack
20	Parthenium Awareness Program	26/11/2024	60/44/104	Harminder bay, South Andaman	T. Harshan K. T. Subramani
21	Awareness programme on “Conservation of Indigenous livestock breeds”	19/12/2024	38/30/68	Bakultala, North and Middle Andaman	A.K. De

Total Beneficiaries: 1008 (Male 640 & Female 368)

h) Livestock health Camp

Sl. No	No. Of animals	Date	Venue	Coordinators
1	37	01/03/2024	Pilpillo, Nicobar	A.K. De
2	11	19/10/2024	Indira Nagar	P. Perumal Parag Deori
3	15	24/10/2024	Calicut and New Bimlitan	P. Perumal Baljit Kaur
4	16	02/11/2024	Manglutone	P. Perumal Parag Deori
5	10	28/11/2024	Rangachang	P. Perumal T.P. Swapna
6	25	11/12/2024	Shaheed Dweep	P. Perumal Subhash B. Palve
7	25	19/12/2024	Rangat	P. Perumal Satish Kumar
9	34	19.12.2024	Aamkung, Rangat	A.K. De P. Perumal
9	25	20/12/2024	Karmatang	P. Perumal Sujatha Hegde
10	25	20/12/2024	Nimbudera	P. Perumal

i) Exposure visit Students /Farmers

Sl. No	Programme	Participants M/F/T	Date	Coordinators
1	Exposure visit on fisheries and allied activities at ICAR-CIARI for M.Sc. students with faculty from Pondicherry University, Brookshabad Campus	21/10/31	16/10/2024	J. Praveernaj K. Saravanan, R. Kiruba Sankar D. Bhattacharya
2	Exposure Visit for Kendra Vidyalaya No. 2 school students, Minnie Bay	75/50/125	28/10/2024	D. Karunakaran
3	Exposure Visit for PM Shri Government Senior Secondary School	240/0/240	22/11/2024	D. Karunakaran S.S. Yeligar
4	Exposure Visit to Integrated Farming System	160/70/230	25/11/2024	T. Subramani, T. Harshangkumar Abhilash

Sl. No	Programme	Participants M/F/T	Date	Coordinators
5	Exposure Visit to Agro meteorological Observatory	89/66/155	03/12/2024	Abhilash T. Harshangkumar T. Subramani
6	Exposure visits of JNRM students to agro-tourism unit by JNRM students	22/50/72	28/11/2024	J. Praveenraj
7	Agricultural Education Day.	50/0/50	03/12/2024	D. Karunakaran
8	Awareness Program on Marine Fauna (Students)	130/0/130	Jul-Aug 2024	R. Kiruba Sankar K. Saravanan J. Praveenraj D. Karunakaran
9	Awareness on Citizen Science Initiatives (Students)	130/0/130	Jul-Aug 2024	
10	Demonstration on NICMIS Android App (Students)	130/0/130	Jul-Aug 2024	
11	Induction Program on Sea Safety Gears (Students)	130/0/130	Jul-Aug 2024	
12	Study Tour (Students)	130/0/130	Jul-Aug 2024	
13	Coastal Fisheries Information Hub Visits (Students)	130/0/130	Jul-Aug 2024	
14	Science Projects (Students)	130/0/130	Jul-Aug 2024	
15	Awareness Program on Marine Fauna (Fishermen)	20/0/20	Jul-Aug 2024	
16	Awareness on Citizen Science Initiatives (Fishermen)	20/0/20	Jul-Aug 2024	
17	Demonstration on NICMIS Android App (Fishermen)	20/0/20	Jul-Aug 2024	
18	Awarness Program on Tribal Heritage Janjati Gaurav Diwas & Fisheries Day (Fishermen)	27/2/29	21-23 Nov 2024	

Total Beneficiaries: 1902 (Male 1654 & Female 248)

j) Radio Talks /Advisory

Title	Date of broadcast	Expert
Tamil Programme: Ethno Veterinary Medicinal Practices	20/10/2024	T Sujatha
Kinsan Vani/Krishi paramarsh (Frequency-684KHz/100.9MHz)	Tuesday, Thursday and Saturday	Agro advisory weekly twice and IBF from ICAR-CIARI

Title	Date of broadcast	Expert
Krishi Jagath/ Krishi paramarsh (Frequency-684KHz/100.9MHz)	Monday, Wednesday and Friday	Agro advisory weekly twice and IBF from ICAR-CIARI

k) Doordarshan Interview

Title	Date of broadcast	Expert
Ethno Veterinary Medicinal Practices	18/01/2024	T. Sujatha
Clean milk production	16/05/2024	A. K. De
Animal genetic resources of Andaman and Nicobar Islands	06/06/2024	A. K. De
Pig rearing: a boon to island farmers	05/09/2024	
Good Agricultural Practices for Island Agriculture	22/08/2024	T. Harshangkumar
Strategies to make foot and mouth disease Mukt Islands	12/09/2024	Jai Sunder
Shrimp culture in biofloc system	25/09/2024	Chittaranjan Raul
Entrepreneurship development through rural poultry production	03/10/2024	T. Sujatha
Rabbit Farming in Andaman and Nicobar Islands	10/10/2024	R.R. Alyethodi
Information and Communication Technology and AI Applications in Agriculture and Related Sectors	17/10/2024	D. Karunakaran
Anti-microbial resistance and one health	07/11/2024	Jai Sunder
Crop Planning for post monsoon season in Andaman and Nicobar Islands	28/11/2024	Abhilash
Tamil programme : Ethno Veterinary Medicinal Practices	03/12/2024	T. Sujatha
Techniques for Moisture Management in Agricultural Crops	05/12/2024	T. Harshangkumar
Entrepreneurship development in goat farming	12/12/2024	Jai Sunder

l) Students guided

Name of the Scientist	Name of the student	Degree/ University	Period
Ajit A. Waman	Shrutika S	M.Sc. (Biotechnology), GITAM University, Vizag	3 months
Pooja Bohra	Neha Kumari Uraon	M.Sc. (Biotechnology), GITAM University, Vizag	3 months

m) Newspaper advisories

Title	Newspaper	Date of publication	Expert
Agro Advisory Bulletin from ICAR-CIARI	Daily Telegram	26/04/2024	Abhilash T. Subramani Jai Sundar P.K. Singh Zamir Ahmad Y. Ramakrishna Santosh Kumar V. Damodaran E.B. Chakurkar
	Daily Telegram	27/04/2024	
	Dweep Samachar	15/05/2024	
	The Daily Telegram	30/05/2024	

Krishi Vigyan Kendras

ICAR-CIARI-KVK, South Andaman

Training

Discipline	No. of Training	Male	Female	Total
Horticulture	1	9	5	14
Plant Protection	2	5	20	25
Home Science	6	3	133	136
Total	9	17	158	175

Front Line Demonstration (FLD) and On Farm Trials (OFT)

Discipline	No. of FLD	No. of OFT
Horticulture	1	-
Home Science	2	2
Total	3	2

ICAR-CIARI-KVK, North and Middle Andaman

Training

Discipline	No. of Training	Male	Female	Total
Agronomy	04	103	47	150
Horticulture	03	55	35	90
Animal Science	01	51	26	77
Fisheries	02	45	25	70
Agril. Engg.	02	40	08	48
Home Science	03	15	63	78
Total	15	309	204	513

Front Line Demonstration (FLD) and On Farm Trials (OFT)

Discipline	No. of FLD	No. of OFT
Agronomy	02	01
Horticulture	01	01
Agril. Engg.	02	03
Total	05	05

ICAR- CIARI-KVK Nicobar

Training

Discipline	No. of Training	Male	Female	Total
Agronomy	2	40	40	80
Horticulture	4	63	47	110
Animal Science	3	107	43	150
Fisheries	1	55	9	64
Agril. Engg.	1	15	15	30
Social Science	2	45	30	75
Total	13	325	184	509

Front Line Demonstration (FLD) and On Farm Trials (OFT)

Discipline	No. of FLD	No. of OFT
Agronomy	3	1
Horticulture	22	2
Agril. Engg.	3	2
Home Science	3	2
Total	05	07

Plate 54. Glimpses of activities

Moments to cherish

Impression of delegates

Dr. Himanshu Pathak, Secretary of DARE and Director General of ICAR, praised the institute's recent developments and new initiatives, congratulating the staff on their achievements and wishing them future success. Pradip Dey, Director of ICAR-ATARI, Kolkata, expressed admiration for the institute's accomplishments and dynamic leadership under Dr. Eaknath B. Chakurkar, congratulating the team on their excellent work and teamwork.

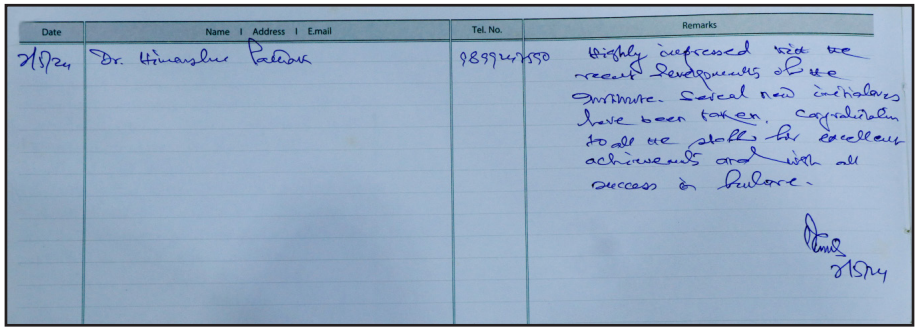

Plate 55. Impression of Secretary, DARE, DG, ICAR

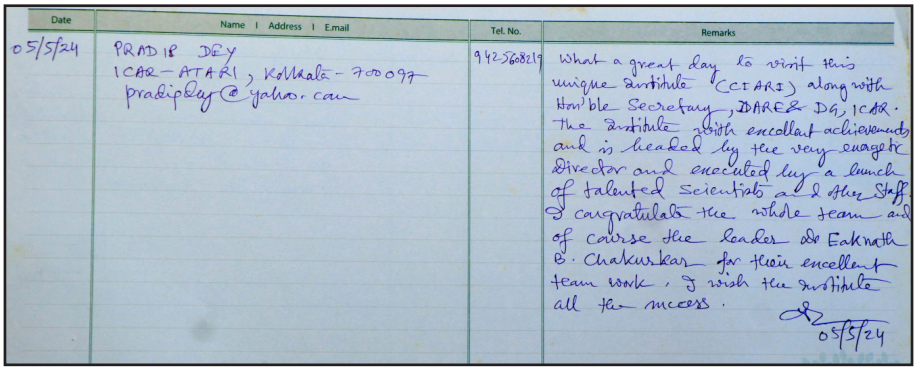

Plate 56. Impression of Director, ICAR-ATARI

Linkage and Collaboration with Other Departments

ICAR-CIARI has developed developed reseach and academic linkages and signed MOU with following institute and universities-

S No.	Certificate No	Name of the University	Date of signing	Tenure
1	AA-144567	West Bengal University of Animal & Fishery Sciences, West Bengal,	28/05/2018	05 Years
2	26 AB 82888	Bidhan Chandra Krishi Viswavidyalaya, West Bengal	20/07/2018	05 Years
3	AA-470650	Tamil Nadu Dr. J. Jayalalithaa Fisheries University	28/10/2018	05 Years
4	K-102907	Odisha University of Agriculture and technology, Bhubaneshwar	26/11/2018	05 Years
5	AN00790274355953T	Tamil Nadu Veterinary and Animal Sciences University	30/10/2021	05 Years
6	IN-AN00992990654611U	Acharya N.G. Ranga Agricultural University, Andhra Pradesh	07/01/2022	05 Years
7	IN-AN01136348805330U	Kerala Agricultural University, Kerala	28/03/2022	05 Years
8	IN-AN01289857647129U	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli.	08/05/2022	05 Years
9	IN-AN001367544636632U	Dr. Y. S. R. Horticultural University, Andhra Pradesh	18/06/2022	05 Years
10	IN-AN022057631063164V	Bishop Heber College (Autonomous), Tamil Nadu	27/02/2022	05 Years
11	IN-AN02439423531455V	CCRAS- Central Council for Research in Ayurvedic Sciences-Regional Ayurveda Research Institute, Port Blair	31/10/2023	05 Years
12	IN-AN02456204512496V	Tamil Nadu Agriculture University, Tamil Nadu,	03/07/2024	05 Years
13	IN-AN02769945206841W	CSIR- Central Institute of Medical and Aromatic Plants, Lucknow	06/06/2024	05 Years

Personnel

Director Dr. Eaknath Bhanudasrao Chakurkar

HEAD / INCHARGE DIVISIONS / SECTION/ KVK

Head, Division of Animal Science	:	Dr. Jai Sunder
Head, Division of Horticulture and Forestry	:	Dr. Raj Narayan w.e.f 29th July, 2024
Head (I/c), Division of Natural Resource Management	:	Dr. T. Subramani
Head (I/c), Division of Fisheries Science	:	Dr. R. Kirubasankar
Head (I/c) Field crop Improvement and protection Section		Dr. Pankaj Kumar Singh
Senior Scientist & Head, KVK (South Andaman)	:	Dr. Y. Ramakrishna
Senior Scientist & Head, KVK (Nicobar)	:	Dr. Santosh Kumar
Senior Scientist & Head, KVK (North & Middle Andaman)	:	Dr. V. Damodaran
Administrative Officer	:	Shri. Kanisk Bhukar
Finance & Accounts Officer	:	Shri. G. Prasanth
Incharge, Priority setting, Monitoring & Evaluation Cell	:	Dr. Jai Sunder
Incharge, AKMU	:	Shri. D. Karunakaran
Incharge, Library	:	Dr. T. Sujatha
Incharge, Central Instrumentation Facility	:	Dr. Rafeeque Rahman Alyethodi upto 04th September, 2024 Dr. D. Bhattacharya w.e.f. 05th September, 2024
Incharge, Estate Section	:	Er. M. Arul Selvam
Incharge, Guest House	:	Shri. A.K. Tripathi
Incharge, Housekeeping		
Incharge, Security Officer	:	Shri. P. Karupaiah
Farm Coordinator, Garacharma	:	Dr. T. Subramani
Farm Coordinator, Sippigaht Farm	:	Dr. Ajit Arun Waman
Farm Coordinator, Bloomsdale Farm	:	Dr. P.K. Singh
Farm Coordinator, Marine Hill	:	Dr. R. Kirubasankar
Incharge, ITMU	:	Dr. T. Sujatha
Incharge PG Cell	:	Dr. T. Sujatha
Hindi Cell I/c	:	Shri. Shyam Sunder Rao
Nodal Officer, Regional Centre, Minicoy	:	Dr. R. Kirubasankar
Incharge, Regional Station, Minicoy	:	Dr. Y. Gladston
Farm Superintendent (Garacharma/Sippighat/ Bloomsdale Farm)	:	Shri. A.K. Tripathi

Farm Manager, Garacharma Farm Manager, Sippighat	:	Shri. A.K. Tripathi
Farm Manager, Bloomsdale Farm	:	Shri. Shyam Sunder Rao
Vigilance Officer	:	Dr. T. Sujatha
Nodal Officer, HRD	:	Dr. R. Kirubasankar
Central Public Information Officer	:	Dr. Rafeeque Rehman Alyethodi
Nodal Officer online ARMS	:	Dr. Jai Sunder
Nodal Officer, ASRB Online Exam ,ERP, E-office & Krishi Portal, Biometric, Social Media	:	Shri. D. Karunakaran
Nodal Officer, Swachh Bharat Abhiyan	:	Dr. I. Jaisankar
Nodal Officer, STC	:	Dr. K. Saravanan
Nodal Officer E-HRMS	:	Shri. Kanishk Bhukar

Division of Horticulture and Crop Improvement Division

- Dr. Raj Narayan, Pr. Scientist (Vegetable Science) & Head
- Dr. Ajit Arun Waman, Sr. Scientist (Spices, Plantation Crops, Medicinal and Aromatic Plants)
- Dr. Pooja Bohra, Sr. Scientist(Fruit Science)

Division of Natural Resource Management

- Dr. T. Subramani, Sr.Scientist (Agronomy) and Head (I/c)
- Dr. I. Jaisankar, Sr. Scientist (Agroforestry)
- Dr.Abhilash, Scientist (Agricultural Meteorology)
- Dr. TalaviyaHarshangkumar, Scientist (Agricultural Chemicals)

Division of Animal Science

- Dr. Jai Sunder, Pr. Scientist (Veterinary Microbiology) & Head
- Dr. D. Bhattacharya, Pr. Scientist (Vet. Parasitology)
- Dr. T. Sujatha, Pr.Scientist (Poultry Science)
- Dr. P.A.Bala, Pr.Scientist (Animal Nutrition)
- Dr. A.K. De, Sr. Scientist (Animal Biotechnology)
- Dr. P. Perumal, Sr. Scientist (Animal Reproduction & Gynaecology)
- Dr. K. Muniswamy, Scientist (Animal Biotechnology)
- Dr. Rafeeque Rahman Alyethodi (Animal Genetics & Breeding)
- Dr. Sharath S. Yeligar, Scientist (Agricutlural Economics)

Division of Fisheries Science

- Dr. R. Kirubasankar, Sr. Scientist (Fish & Fisheries Science) & Head(I/c)
- Dr. K. Saravanan, Sr. Scientist (Fish Health)
- Mr. D. Karunakaran, Scientist (Computer Application in Agriculture)
- Mr. J. Praveenraj, Scientist (Fish Health)
- Mr. Gladston Y., Scientist (Fisheries Resource Management)
- Mrs. Ajina S.M., Scientist (Fisheries Resource Management)
- Dr. Chittaranjan Raul, Scientist (Aquaculture)

Filed Crops Improvement and Protection Section

- Dr. P.K. Singh, Pr. Scientist (Plant Genetics & Breeding) & Head (I/c)
- Dr. Prabhu P., Scientist (Economic Botany & Plant Genetic Resources)

Krishi Vigyan Kendra, Port Blair

- Dr. Y. Ramakrishna, (Agronomy) Pr. Scientist & Head
- Dr. Zachariah George, Subject Matter Specialist (Animal Science)
- Dr. Pooja Kapoor, Subject Matter Specialist (Home Science)
- Miss. Sushma, SMS (Spices, Plantation Crops, Medicinal and Aromatic Plants)
- Dr. Mohit, SMS (Plant pathology)

Krishi Vigyan Kendra, North & Middle Andaman

- Dr. V. Damodaran, (Agronomy) Sr. Scientist & Head
- Er. Manoj Kumar, Subject Matter Specialist, (Agricultural Engineering)
- Mr. Yatharth Sharma. SMS (Home Science)
- Mr. Subam Debroy, SMS (Aquaculture)
- Mr. Rakesh Dawar, SMS (Agronomy)

Krishi Vigyan Kendra, Nicobar

- Dr. Santhosh Kumar, (Horticulture), Pr. Scientist & Head
- Dr. Akshay, SMS (Fruit Science)
- Mr. Deepo Meena, SMS (AS & PE)
- Mr. Ajmal SMS (Agricultural Economics)
- Mr. Sanketh. G.D, SMS (Agronomy)

Promotion/ transfer/ retirement/ obituary

Appointment

- Shri. Kanishk Bukar, Administrative Officer joined on 22nd April, 2024
- Shri. G. Prasanth, FAO joined on 22nd April, 2024
- Mr. Abhishek Kumar, (T-1) joined on 25th April, 2024
- Smti. Savita Kumari, (T-1) joined on 29th April, 2024
- Mr. Ujjwal Kumar, (T-1) joined on 30th April, 2024
- Mr. Brajesh Kumar, (T-1) joined on 30th April, 2024
- Shri. Akshay SMS (Fruit Science) joined on 14th June, 2024
- Smti. Teena, STO (T-6) joined on 25th June, 2024
- Shri. Mohit, SMS (plant pathology) joined on 26th June, 2024
- Ms. Sushma, SMS (Spices, Plantation Medicinal and Aromatic Plants) joined ay ICAR-CIARI-KVK, Sippighat on June 28, 2024
- Shri. Deepoo Meena, SMS (Agricultural Structures and Process Engineering) at ICAR-CIARI-KVK, Nicobar on June 28, 2024
- Shri. Ajmal. S, SMS (Agricultural Economics), ICAR-CIARI-KVK, Nicobar on July 3 , 2024
- Shri. Yatharth Sharma, SMS (Home Science) joined ICAR-CIARI on July 5, 202
- Shri. Subam Debroy , SMS (Aquaculture) joined at ICAR-CIARI-KVK, N & M Andaman, on July 8, 2024
- Shri. Sanketh GD, SMS (Agronomy) joined ICAR-CIARI on July 8, 2024
- Shri. Rakesh Dawar, SMS (Agronomy), ICAR-CIARI-KVK, N&M Andaman on July 9, 2024,
- Dr. Raj Narayan, Principal Scientist joined ICAR-CIARI on July 29, 2024

Promotion

- Shri. Ramen Barman, SSS to T1 joined on 18th April, 2024
- Shri. Karpaya, Assistant to AAO on 06th November, 2024
- Shri. Prakash Mondal, Assistant to AAO on 06th November, 2024

Transfer

- Shri. Sombir, T1 transferred to ICAR-KVK, Hardoi.
- Shri. Kishore Tele, Technical Officer transferred to ICAR- National Institute of Secondary Agriculture, Namkum, Ranchi on 31st December, 2024.

Technical Resignation

- Abhishek Chitranashi, Senior Technical Officer

Retirement

- Shri. A. Babu Swamy, TO on 31st May, 2024.
- Shri. Dr. S. K. Zamir Ahmed, Pr. Scientist on 30th June, 2024.
- Smt. Ashima Saha, AAO on 31st October, 2024
- Shri. R. Dharma Rao, SSS on 31st December, 2024

Weather Conditions at Sri Vijaya Puram, Andaman & Nicobar Islands: an Overview

Based on data recorded at the agro-meteorological observatory of ICAR-Central Island Agricultural Research Institute (ICAR-CIARI), Sri Vijaya Puram, the cumulative rainfall for the year 2024 (01 January to 31 December) was 3620.20 mm, accumulated over 155 rainy days. The rainfall events were categorized as follows: 14 days of very light rainfall, 76 days of light rainfall, 50 days of moderate rainfall, 11 days of heavy rainfall, and 4 days of very heavy rainfall. The highest monthly rainfall of 767.2 mm was observed in June, while March recorded no rainfall. The mean annual temperature for the year was 27.55°C, with mean maximum and minimum temperatures of 31.8°C and 23.3°C, respectively. May saw the highest mean monthly temperature at 36.0°C, while January recorded the lowest mean monthly temperature of 19.0°C. These climatic parameters reflect the diverse rainfall distribution and temperature variations throughout the year, as illustrated in the figure below.

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PUBLISHED SIMULTANEOUSLY FROM KOLKATA,SILIGURI,GANGTOK,GUWAHATI AND SRI VIJAYA PURAM (PORT BLAIR)
PAGES 8 SRI VIJAYA PURAM • WEDNESDAY • DECEMBER 11, 2024

Workshop on Sexual harassment at workplace

SRI VIJAYA PURAM, DEC 10/--/ Women cell of ICAR- CIARI, Sri Vijaya Puram organized workshop for conducting awareness on Sexual harassment of women at workplace (prevention, prohibition and redressal) as per POCH Act 2013 on 9th December 2024. The POSH Act mandates all organizations, both private and public, to establish Internal Committees (ICs) for handling sexual harassment complaints. ICAR-CIARI under the banner of its Internal (women) Complaint Committee (ICC) conducted sensitization programme on prohibition of sexual harassment. The guest talk was delivered by Advocate Smti. Rinku Narayan, District and Session Court, A&N Islands. She detailed the history and background of the POCH act. She explained about VISHAKA guidelines and importance of ICC to address sexual harassment cases. She also narrated about various forms of sexual harassment and how to lodge such type of complaints.

Dr.T.Sujatha, Principal Scientist & Chairman, Internal (women) Complaint Committee, ICAR-CIARI informed that ICC at ICAR-CIARI has not hav complaints. Simultaneous AIDS control was given Yasmeen, Deputy Director AIDS Control Society. D Director, ICAR-CIARI urg to raise voice while suc harassment happens at w advised for self-managem to prevent the sexual workplaces. The program with vote of thanks Bhukar, Administrative Officer and organizing secretary of the programme.

ANDAMAN CHRONICLE
THE DAILY DIARY OF THE ISLANDS.

ICAR-CIARI Conducts Agriculture Education Day (AED) – 2024

Denis Giles — 05 December 2024

CAR-CIARI celebrated "Agriculture Education Day" on December 3, 2024, in honor of r. Rajendra Prasad, the first President of India. In line with this celebration, ICAR- f events for school students from December 2 to December 3, 2024. A total of 37 9 participated in painting competition on the theme "Showcase the Charm and ; and Farming Life," representing 12 different schools. The participating institutions ra Zilla Parishad Vidyalaya Port Mout, Khalsa Public School, Vivekananda Kendra hool, Middle Point, Government Girls Senior Secondary School, Navy Children ernational School, and Saraswati Shishu Mandir Senior Secondary School, along nment Demonstration Multipurpose School, and Nirmala Senior Secondary

2, 2024, a speech competition was held for students in grades 9 to 12, with 37 , including St. Mary's School, Vivekananda Kendra Vidyalaya, Navy Children Government Model Senior Secondary School, Government Senior Secondary School Port Mout, Rabindra Bangla Vidyalaya, Vivekananda Kendra Zilla Parishad Vidyalaya Port Mout, Kamaraj English Medium School, and Government Girls Senior Secondary School.

Secretary, DARE & Director General, ICAR, New Delhi urges farmers to embrace scientific farming to boost income

Mayabunder, May 7 Dr. Himanshu Pathak, Secretary, DARE & Director General, ICAR, New Delhi urged the farmers to seize the available opportunities and

He remarked that KVK will showcase innovative techniques to enhance production and increase income. He said, with knowledge and expertise,

varieties with new ones developed by scientists, as the improved varieties yield four times more.

Dr. V.B. Patel, ADG (F&PC)

importance of KVK providing various training programs to farmers in Agriculture, Animal Science, Fisheries, and other related fields to highlighted the

(Contd. on last page)

ANDAMAN SHEEKHA
True Mirror of Andaman and Nicobar Islands

Training on ICT Applications in Agriculture and Allied Sectors and live viewing of the first episode of Krishi Choupal at ICAR-KVK CIAR Nicobar

DECEMBER 9, 2024 BY SANJIB — LEAVE A COMMENT

Sri Vijaya Puram, Dec 09: A one-day training programme on "Introduction to ICT Applications in Agriculture and Allied Sectors" was successfully conducted at ICAR-KVK Nicobar, CIARI. The training aimed to enhance participants' understanding of ICT tools and their applications in agriculture to improve productivity and efficiency. Twenty five participants from Car Nicobar attended the training. The event emphasized the role of ICT in bridging the gap between farmers and scientific knowledge. Participants were introduced to various digital platforms and tools that assist decision-making, resource management, and access to market information. A key feature of the program was the live viewing of the first episode of "Krishi Choupal," an initiative by the Department of Agriculture and Farmers Welfare, and the Department of Agricultural Research and Education, in collaboration with Doordarshan and All India Radio. The "Krishi Choupal" series aims to provide farmers with a unique platform for technology dissemination through recorded farmer-scientist interactions. The episode featured discussions on innovative practices, challenges faced by farmers, and solutions offered by agricultural experts. The training focused on the integration of ICT in extension services and the role of initiatives like "Krishi Choupal" in strengthening knowledge transfer. Participants expressed enthusiasm for adopting ICT tools and appreciated the collaborative approach to solving field-level challenges. The programme concluded with an interactive session, where farmers shared their feedback and sought clarifications on ICT applications. The initiative reaffirmed ICAR-KVK Nicobar's commitment to empowering farmers with technology-driven solutions. The technical sessions were coordinated by Dr. Santosh Kumar, Senior Scientist & Head, ICAR-KVK Nicobar and led by subject matter specialists Mr. Deepoo Meena, Mr. Ajmal S., Mr. Sanketh G.D., and Dr. Akshay. The training was organized under the guidance of Dr. Eaknath B. Chakurkar, Director of ICAR-CIARI, Sri Vijaya Puram.

ANDAMAN CHRONICLE
THE DAILY DIARY OF THE ISLANDS.

ICAR-CIARI Conducts Exposure visit cum Training Programme on "Quality Seed and Planting Material in Agri-horticultural Crops for Nicobarese Tribal Farmers

Denis Giles — 16 February 2024

The Daily Telegram
...the Largest Circulating Daily of the Isla
153 Port Blair, Thursday, June 06, 2024 Web: dt.andaman.gov.in

Mass tree planting drive organised to celebrate World Environment Day

Port Blair, June 5
World Environment Day is observed worldwide on June 5 to encourage awareness and action for environmental protection. The theme for World Environment Day 2024 was 'Land restoration, desertification, and drought resilience,' highlighting the urgent and existential concerns. The current environmental crisis serves as a collective warning we must heed. As part of World Environment Day, ICAR-Central Island Agricultural Research Institute (CIARI), Port Blair organized a mass planting of seedlings involving all staff members. A total of 750 seedlings, including species such as Albizia lebbeck, Jackfruit, Leucaena leucocephala, Gmelina arborea, greenhouse Chakurmeni, and G grandis

over an area of 7000 m² in plant at least one tree for the campus. All staff members participated in this green initiative, aimed developing a sustainable year-round production model and restoring the degraded land available on the campus. The Director, ICAR-CIARI, emphasized the importance of trees in

future generations, actively supporting both livelihood and environmental sustainability. The institute will continue planting activities throughout June and July, focusing on several multi-purpose tree species. The program was coordinated by Dr. Jaisankar, Senior Sc

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SSUE NO 9 PAGES 8 PORT BLAIR • SATURDAY • MAY 18, 2024

ICAR-CIARI, TIFAC, DST conduct round table meeting o "Climate Resilient Technologies for Island Agriculture"

PORT BLAIR, MAY 17/--/ ICAR-Central Island Agricultural Research Institute (CIARI), Port Blair, in collaboration with the Technology Innovation Forecasting and Assessment Council (TIFAC), DST, New Delhi, organized a Round Table Discussion on "Climate Resilient Agriculture Technologies for Islands" on 15th May, 2024, at ICAR-CIARI, Port Blair. Agriculture in islands is particularly vulnerable to climate vagaries such as rising

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THE DAILY DIARY OF THE ISLANDS.

CIARI Organises Conference on Organic/Natural Farming

Denis Giles — 20 December 2024

ICAR-Certified Technology - 2024

2-7-10-15 module of oral iron supplementation for control of iron deficiency anaemia (IDA) in piglets: Protocol

Dweep Carp Grower Feed

ICAR-Central Island Agricultural Research Institute

Sri Vijaya Puram -744105

Andaman & Nicobar Islands, India