वार्षिक प्रतिवेदन
Annual Report
2019

भा.कृ.अनु.प. - केन्द्रीय कृषिरत महिला संस्थान
(भारतीय कृषि अनुसंधान परिषद)
भुवनेश्वर - 751 003, ओडीशा, भारत
ICAR- CENTRAL INSTITUTE FOR WOMEN IN AGRICULTURE
(Indian Council of Agricultural Research)
Bhubaneswar - 751 003, Odisha, India

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Preface

In the agricultural sector, women participate in various agro-production systems that govern the nature and extent of their involvement. There is significant heterogeneity across regions, states, locations and context in the role of rural women and their participation in agricultural and other economic activities. Most significant agricultural activities undertaken by women include farming, horticultural crop production, post harvest management, management of livestock, fisheries and homestead resources. Data on role profile indicates that joint participation of rural women with men was higher than independent participation of women in most activities. Agricultural development cannot take place without fullest consideration from family life, general education of women, improvement of home conditions, nutrition, housing, sanitation, personal health, clothing and cultural arts. Therefore, attention should be given to these areas and the researchers and policy makers should sensitize themselves for the development and wellbeing of women in agriculture.

The ICAR-Central Institute for Women in Agriculture (ICAR-CIWA), Bhubaneswar was recognised as 'Best Women Empowerment Institute in Asia Award-2019' for excellence in agriculture and allied activities by Global Education & Economic Development Forum (GEEDF), New Delhi. The Institute, is first of its kind in the world that is exclusively devoted for undertaking research on gender issues in agriculture and allied fields, gender-equitable agricultural policies/ programmes and gender-sensitive agricultural-sector responses and co-ordinating research on Home Science through its AICRP centres spread across 12 states in India. The Institute carries out action research programmes in various aspects related to women in agriculture. These activities are carried out through in-house, inter-institutional, network or collaborative and coordinated modes of research. During 2019, the Institute implemented seventeen institutional research projects, six externally funded projects (DSIR/ IRRI/ Mahindra & Mahindra/ ICAR), AICRP on Ergonomics and Safety in Agriculture (ESA) and AICRP on Home Science focusing on nutritional security, livelihood enhancement, technological empowerment and entrepreneurship development of farm women. For ensuring gender sensitization among various stakeholders, a gender sensitization lab is conceptualized. The gender knowledge system (GKS) in agriculture portal (http://www.icar-ciwa.org.in/gks) was strengthened by adding latest publications and statistics related to women in agriculture. A web based dynamic database was developed for generating data tables related to state wise gender work participation in agriculture.

Low cost terafil water filter and smokeless chulhas were introduced among the the identified farm families in Semala village, Umarkote, Odisha to improve women's health condition involved in household chores. Considering efficient spatial and temporal utilization of interspaces in mango orchards, suitable intercrops were raised in the mango orchards of Harekrushnapur and Baskitala villages of Mayurbhanj, Odisha in a participatory action mode to cater to the financial and nutritional requirements of 55 farm families. Female agriculture work participation (as percent of population) were worked out for all the 640 districts of India and thematic maps were generated using QGIS3.10. Thematic map for female agriculture work participation was overlaid with 15 agro-climatic regions (ACR) for analysing the spatial distribution of female agricultural workers across different ACR. Fifty farm women each from 3 districts viz., Cuttack, Jagatsinghpur and Puri were imparted training on complete package of practices in dairy farming. Proper feeding and management of goat and timely vaccination enabled the farm women to reduce the mortality of kids from 20 percent to 5 percent.

Two model prototypes of disc ridger based on the anthropometry and strength of farm women were developed and tested for operational parameters *viz.,* width of ridge and height of ridge. Designing and development of Gender Sensitive Agri-Nutri (GSAN) farming system model was undertaken in Sankilo and Tentalpur villages of Nischintakoili block, Cuttack, Odisha. A gender sensitive model for doubling farmers' income by addressing gender concerns and technological gaps was also evolved during the period. Management of homestead aquaculture ponds were scientifically demonstrated following water quality management and supplementary feeding. Trainings on water quality testing and trellis system development for growing vegetables on the pond bunds were imparted to the beneficiaries with homestead ponds. In the first season, an average production of 298.2 kg of IMC was obtained from 0.17 ha water area with an average weight at harvest of 742 gm. A net profit of Rs.20,560/- was realized during the season. A poultry production model was also developed to address the livelihood and nutrition of farm family.

Under the IRRI-CIWA collaborative project, 8 producer groups processed and marketed aromatic rice through Chitri Dora farmers producer company. With the partnership of ICAR-CIWA-PRADAN -Mahindra & Mahindra Ltd., combination of carefully sequenced supports were given to reduce the women's drudgery issues in paddy, ragi (millet) and vegetables based farm operations for the increase of work efficiency and income of farm women. Under DSIR funded project, perceived occupational needs of fisherwomen were studied through survey of 200 fisherwomen selected from 20 different SHG groups from

Astaranga and Puri Sadar Blocks of Puri District, Odisha, in which credit was noted as the most important need by 100 percent women. Under AICRP on Ergonomics and Safety in Agriculture, a multipurpose harvesting bag for easy loading and unloading was designed and developed. A cost-effective power operated groundnut stripper cum decorticator was developed, which is affordable to farm women, marginal and small-scale farmers. A survey of participating 100 farm women from dairy, horticulture and farm implements sectors was conducted on their role performance, needs, perceptions to understand the women and gender issues in selected agro-based industries under extramural research project of ICAR.

The All India Coordinated Research Project (AICRP) on Home Science, which has been proposed as AICRP on Women in Agriculture is operating in 13 Centres in 12 States. Under the Project (AICRP), a total of 362 foods from different food groups having low Glycemic Index for the management of diabetes was prepared. The products of high fibre multigrain mix was formulated for management of over nutrition/ obesity and region specific Nutri-dense Ready to Use Mix was developed for management of under nutrition. Two MoUs were signed and a mobile app on diet on diabetic persons was developed by AAU, Jorhat. An effort was made to design and develop products for various end uses using locally available underutilized fibres. Products of the eco-based fabric were designed, developed and evaluated for functional performance. A patent on "Biodegradable mesta composite pots for nurseries" invented by UAS, Dharwad has been filed and published. Fifty one (51) improved technologies have been recommended for farm women to address drudgery issues in eleven production systems. Twenty one (21) technologies were developed for reduction of drudgery of women workers in the selected enterprises. A package on "Reproductive health care for psychological wellbeing of married women" was developed. A mobile app on parenting was developed by UAS, Dharwad Centre.

The year 2019 witnessed momentous achievements through various research outcomes, inter-institutional HRD programmes, IRRI-CIWA, CIWA-Mahindra, CIWA-State Govt. collaborative activities, celebration of important days in addition to the regular research and outreach activities. A two-days workshop for finalization of research projects of proposed AICRP on Women in Agriculture and collaborative research projects of the Institute was organized at ICAR-CIWA, Bhubaneswar during 30-31 August, 2019. A ten days ICAR sponsored short course on "Gender gaps and interventions to address gender issues in agriculture" was organized from 17-26 September, 2019. The Institute conducted four days trainers' training programme on "Promoting technological and economic empowerment of women farmers through gender friendly farming techniques" sponsored by ATMA, Valsad, Gujarat from 14-17 October, 2019. A series of 2 days training programmes were conducted at ICAR-CIWA under CAT programme sponsored by NABARD on "Capacity Building of Farm Women". A three months internship programme was imparted for 11 students of B. Tech. Agriculture Engineering from Centurion University of Technology and Management, Paralakhemundi, Ganjam, Odisha in Fish Processing Technology (5 students) and Farm Machinery and Power (6 students), from 1 July to 30 September, 2019.

The Institute celebrated/ observed important National Days/ Weeks such as Vigilance Awareness Week, *Rashtriya Ekta Diwas,* Agricultural Education Day, Women in Agriculture Day, World Soil Health Day, *Kisan Divas, Swachhta Hi Sewa, Swachhta Pakhwada,* National Productivity Week, National Science Day, International Women's Day, Voter Awareness Forum, International Day of Yoga, Parthenium Awareness Week, Mahila Kisan Diwas, World Food Day, Constitution Day and Citizens' Duties' Campaign, Hindi Pakhwada and Foundation Day. The other national programmes such as Mera Gaon Mera Gaurav (MGMG) and Scheduled Castes Sub Plan (SCSP) were also implemented focussing on technology dissemination, capacity building of beneficiaries, input support and technology showcasing through exposure visits for the socio-economic empowerment of women in agriculture.

ICAR-CIWA is the only institution under Indian Council of Agricultural Research (ICAR) to address gender concerns in agriculture for enhancing the productivity and sustainability in agriculture. In order to demonstrate the output and utilities of gender research, strong partnerships with ICAR institutions, KVKs, SAUs, development agencies, NGOs and international organizations were worked out.

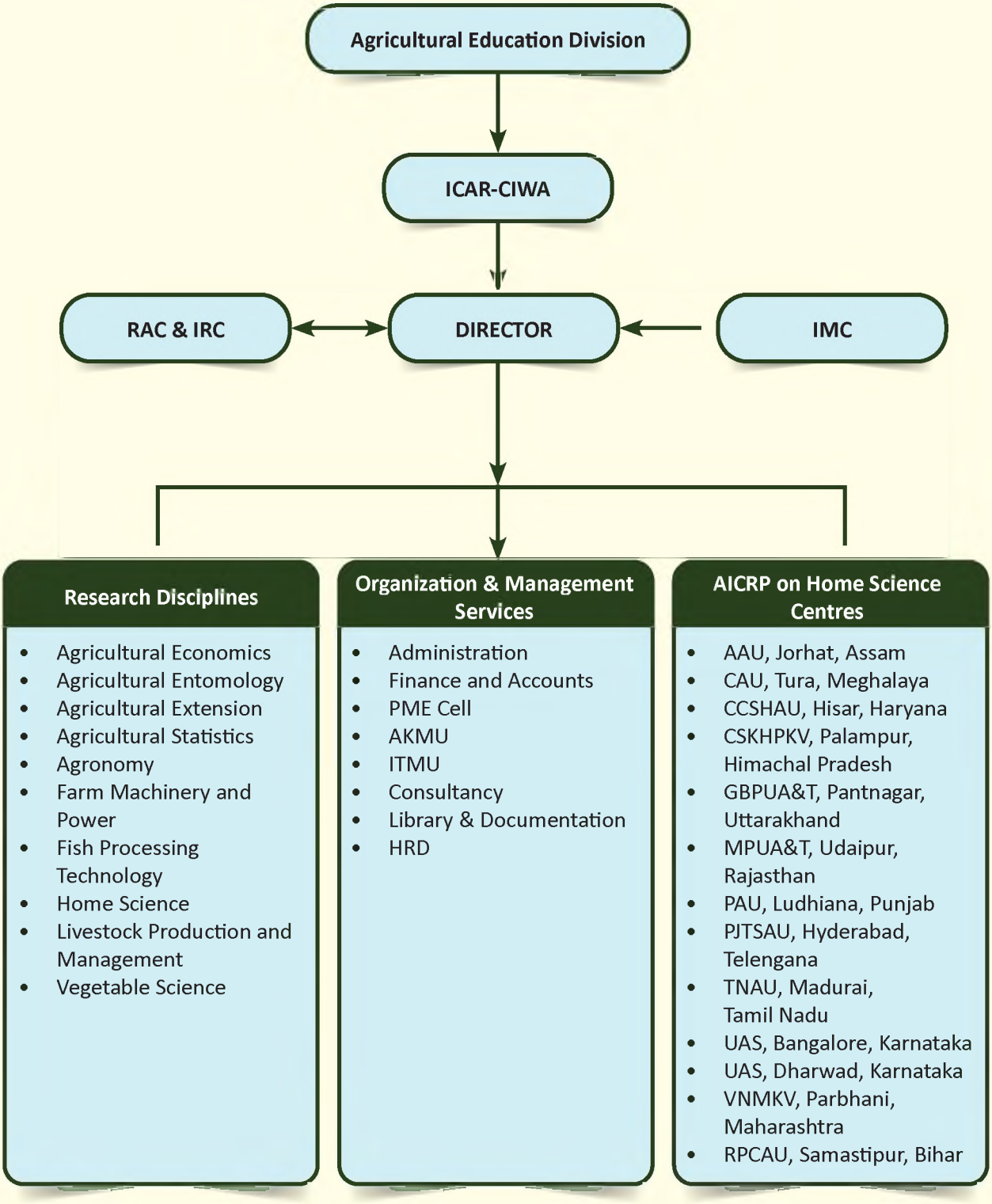
The Institute is highly indebted to Dr. T. Mohapatra, Director General, ICAR and Secretary, DARE, Dr. R.C. Agrawal, Deputy Director General (Ag. Education) and Dr. N. S. Rathore, former Deputy Director General (Ag. Education), ICAR for their able guidance and encouragements received for carrying out the research, extension and other development programmes of the Institute. Sincere thanks are due to Dr. P. S. Pandey, ADG (EP&HS), ICAR for his constant guidance and support. I take this opportunity to express my gratitude to the Editorial Team, all the Staff of the Institute, AICRP on Home Science and AICRP on ESA for their whole hearted support and cooperation in bringing out this Annual Report. I believe that this document will be useful for all the stakeholders, including farmwomen, researchers, policy makers, development functionaries and students interested in gender mainstreaming in agriculture.

S Srivastava.

ICAR-CIWA
Bhubaneswar

(S. K. Srivastava)
Director

Organogram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UAS, Bangalore, Karnataka
UAS, Dharwad, Karnataka
VNMKV, Parbhani, Maharashtra
RPCAU, Samastipur, Bihar

कार्यकारी सारांश

भा.कृ.अनु.प.- केन्द्रीय कृषिरत महिला संस्थान (ICAR-CIWA) दुनिया में अपनी तरह का पहला संस्थान है जो विशेष रूप से कृषि में लिंग संबंधी अनुसंधान के लिए समर्पित है। ICAR-CIWA के पास कृषि और संबद्ध क्षेत्रों में लैंगिक मुद्दों, लिंग-समतामूलक कृषि नीतियों / कार्यक्रमों और लिंग-संवेदनशील कृषि-क्षेत्र प्रक्रियाओ और भारत के 12 राज्यों में फैले इसके AICRP केंद्रों के माध्यम से समन्वय अनुसंधान का एक अधिदेश है। अपने अधिदेश के माध्यम से काम करते हुए, संस्थान के पास लिंग अनुसंधान के लिए एक प्रमुख केंद्र के रूप में उभरने, कृषि उत्पादकता और स्थिरता का एहसास करने के लिए कृषि में लिंग मुख्यधारा और महिला सशक्तीकरण के लिए एक उत्प्रेरक के रूप में कार्य करने की दृष्टि है। संस्थान की प्राथमिक गतिविधियों में आजीविका विश्लेषण के लिए कार्यप्रणाली का मानकीकरण और कृषिरत महिलाओं के लिए भेद्यता ढांचा विकसित करना, आजीविका सुरक्षा के लिए तकनीकी हस्तक्षेप, महिलाओं का कौशल और उद्यमिता विकास, कृषिरत महिलाओं के लिए परिचालनात्मक कठिन परिश्रम का प्रबंधन, भोजन और पोषक परिवारों की सुरक्षा जिसमें पानी, स्वास्थ्य और स्वच्छता शामिल है। वर्ष 2019 के दौरान, संस्थान ने सत्रह संस्थागत अनुसंधान परियोजनाओं और छह बाह्य वित्तपोषित परियोजनाओं को लागू किया। संस्थान की मुख्य शोध उपलब्धियों को यहाँ संक्षेप में प्रस्तुत किया गया है।

संस्थान ने कृषि कार्य भागीदारी और कुपोषण परिदृश्य, ग्रामीण महिलाओं की फोटो गैलरी, दैनिक गतिविधि घड़ी, कठिन परिश्रम में कमी लाना, महिला केंद्रित सरकार की पहल, प्रौद्योगिकियों में महिलाओं के योगदान को उजागर करने के लिए प्रौद्योगिकी हब और लिंग संवेदीकरण माइक्रो-लैब विकसित करने की पहल की है। प्रस्तावित हब में प्रदर्शन के लिए "वॉयस ऑफ वूमेन" के माध्यम से, सफलता की कहानियां तैयार की गई हैं। आगंतुकों की लिंग संवेदनशीलता के पूर्व और बाद के मूल्यांकन के लिए एक प्रश्नावली विकसित की गई है। देश के विभिन्न हिस्सों से एकत्र की गई 600 तकनीकों में से 58 तकनीकों को कृषि शक्ति और मशीनरी के तहत बहुसंख्यक तकनीकों (24) के साथ तैयार की गई चेकलिस्ट के माध्यम से खेत की महिलाओं के लिए उपयुक्त पाया गया। जेंडर सेंसिटिव एग्री-न्यूट्री (जीएसएएन) फार्मिंग सिस्टम मॉडल की रचना और विकास निश्चिन्तकोइली ब्लॉक, कटक, ओडिशा के सांकिलो और टेंटलपुर गांवों में किया गया था। चार पहचान किए गए प्रतिमान (फसल-आधारित, बागवानी-आधारित, पशु-आधारित और उद्यम-आधारित मॉड्यूल) और उनके साक्षात्कार से अनुसूची के माध्यम से भाग लेने वाली खेत की महिलाओं (120) का तलचिन्ह सर्वेक्षण, उनके प्रोफाइल, आहार स्वरुप, भागीदारी और लाभ पर आधारित थी। यह महिलाओं और लैंगिक मुद्दों को समझने के लिए किया गया। यह देखा जा सकता है कि ज्यादातर समस्याएं राज्य के विभागों से संबंधित थीं, इसलिए, यह सुझाव दिया जाता है कि सरकार द्वारा खेत की महिलाओं की समस्याओं और मुद्दों को हल करने के लिए आवश्यक नीतिगत उपाय किए जा सकते हैं। किसानों की आय दोगुनी करने के लिए लिंग संवेदनशील मॉडल विकसित करने के उद्देश्य से तकनीकी और विकास संबंधी अंतराल का विश्लेषण विशेषज्ञों द्वारा किया गया था और तार्किक तकनीकी प्रतिमान तैयार किए गए थे। आवश्यकता आधारित मॉड्यूल को प्रशिक्षण, प्रदर्शनों, क्षमता निर्माण कार्यक्रमों, इनपुट समर्थन और सलाहकार सेवाओं के माध्यम से प्रदर्शित किया गया, जिसमें 125 कृषि परिवारों को शामिल करने वाले 16 कार्यक्रमों के माध्यम से उच्च उपज वाली किस्मों और संकरों को बढ़ावा दिया गया। कृषि में राज्यवार लिंग कार्य भागीदारी से संबंधित डेटा तालिका बनाने के लिए एक वेब आधारित डायनामिक डेटाबेस विकसित किया गया था। जेंडर नॉलेज सिस्टम प्रौद्योगिकी प्रारूप को डेटा संग्रह और संकलन की प्रक्रिया को आसान बनाने के लिए भा.कृ.अनु.प. के प्रौद्योगिकी डेटाबेस में लिंग घटक को शामिल करने के लिए कृषि टीम के साथ साझा किया गया था। कृषि पोर्टल पर AICRP (गृह विज्ञान) के प्रकाशन को डालने के लिए ऑनलाइन डेटा प्रविष्टि और डेटाबेस प्लेटफॉर्म बनाया गया था।

नबरंगपुर, उमरकोट ब्लॉक के सेमला गाँव के किसान परिवारों के प्रोटीन की खपत को बढ़ाने के लिए पोषण संबंधी हस्तक्षेप किये गये, धान की खेती के बाद उपलब्ध अवशेषों की नमी को भुनाने के लिए काले चने की उच्च उपज वाली किस्म पीयू 31 की खेती शुरू करते हुए धान के साथ पैरा खेती के रूप में कराया गया। फसल हस्तक्षेप का जीर्ण एनर्जी की कमी पर सकारात्मक प्रभाव पड़ा, जहां इसने क्रमशः महिलाओं और पुरुषों में 4.53 प्रतिशत और 6.59 प्रतिशत की कमी दिखाई। घरेलू कामों में शामिल महिलाओं की स्वास्थ्य स्थिति को बेहतर बनाने के लिए, टेरफिल वाटर फिल्टर और धुआं रहित चूल्हा भी वितरित किए गए। आकांक्षी जिले मयूरभंज के 2 गांवों में 55 कृषक परिवारों की वित्तीय और पोषण संबंधी आवश्यकताओं को पूरा करने के लिए आम के बागों के लिए उपयुक्त विभिन्न अंतर फसल का प्रदर्शन किया गया है। एक स्थायी आजीविका सूचकांक विकसित किया गया था जिसमें अंतर फसल के रूप में अनानास को उच्चतम स्कोर (86.6) मिला था। पर्यावरण संरक्षण, निबेश पुनराब्रुति, रोजगार सृजन और आय बढ़ाने के मामले में अनानास सबसे अच्छा अंतर फसल साबित हुआ।

दुग्ध उत्पादकों की सहकारिता की स्थापना के प्रभाव को समझने के लिए, खलगांव दुग्ध उत्पादक सहकारी समिति (एमपीसीएस) का चयन किया गया और इसकी गतिविधियों का विश्लेषण और प्रतिचित्रण किया गया। खलगांव एमपीसीएस में कुल 161 सदस्य हैं, जिनमें केवल 10 महिलाएँ हैं। समिति ने 2.37 लाख लीटर दूध (2018-19) एकत्र करके अपने सदस्यों के लिए रु.6.76 लाख का राजस्व उत्पन्न किया। औसतन सदस्यों ने प्रति माह 5082/- कमाए। औसत दूध की कीमत रु.26.48 प्रति लीटर थी। दूध देनें बाली क्रॉसब्रेड गायों में खनिज मिश्रण की महत्वपूर्ण पूरकता के प्रभाव का आकलन करने के लिए एक क्षेत्र अध्ययन किया गया था और इसके परिणामस्वरूप उल्लेखनीय वृद्धि की क्षमता के साथ दूध की उपज में 14.5 प्रतिशत सुधार हुआ। खनिज पूरक समूह में क्रमशः फीड कॉस्ट और फीड दक्षता पर शुद्ध मुनाफे में 21 और 12 प्रतिशत का सुधार हुआ। इसी तरह का अध्ययन बकरियों में किया गया था, जिसके परिणामस्वरूप गर्भावस्था के दौरान सेवाओं की संख्या में सुधार हुआ, पोस्ट पार्टिएंट जटिलताओं में मुख्य रूप से गर्भपात (30%), खनिज

मिश्रण पूरक समूह में प्लेसेंटा और डिस्टोकीया (10%) का प्रतिधारण कम हुआ। सभी 640 जिलों के लिए महिला कृषि कार्य भागीदारी (जनसंख्या का प्रतिशत रूप) की गणना की गई और QGIS3.10 का उपयोग करके विषयगत मानचित्र तैयार किए गए। महिला कृषि कार्य सहभागिता के विषयगत मानचित्र को 15 कृषि-जलवायु क्षेत्रों (ACR) के साथ अलग-अलग क्षेत्रों में महिला कृषि श्रमिकों के स्थानिक वितरण का विश्लेषण करने के लिए निर्धारित किया गया था। होमस्टेड जलीय कृषि में लिंग की भूमिकाओं और जरूरतों का विश्लेषण और सामाजिक स्वीकृति, समकक्ष/ परिवार के सदस्यों का समर्थन, भारतीय मेजर कार्प के साथ छोटे देशी मछलियों के पॉलीकल्चर पर तकनीकी ज्ञान, गुणवत्ता के बीज की समय पर उपलब्धता और ऋण की उपलब्धता को सबसे अधिक माना जाता था। सभी महिला किसानों द्वारा महत्वपूर्ण छोटी देसी मछलियों के साथ भारतीय प्रमुख कार्प के पॉलीकल्चर में, आईएमसी का 298.2 किलोग्राम का औसत उत्पादन 0.17 हेक्टेयर जल क्षेत्र (जो कि परियोजना से पहले लगभग 80 किलोग्राम-130 किलोग्राम/0.17 हेक्टेयर था और 20,560/- रुपये का शुद्ध लाभ प्राप्त हुआ था) पर प्राप्त किया गया था। औसतन 174 किग्रा सब्जियों को तालाबों और तालाबों के चारों ओर ट्रेलिस सिस्टम से 6,419 रुपये की मासिक आय के साथ काटा गया था। मछलियों के परिणामस्वरूप 200-750 ग्राम/15 दिन की कटाई हुई जो पूरी तरह से घरेलू खपत के लिए उपयोग की गई थी। वनराज मुर्गों के उत्पादन प्रदर्शन पर पूरक आहार के प्रभाव का अध्ययन देखने के लिए एक अध्ययन किया गया था। 16-40 सप्ताह की आयु के दौरान 35 ग्राम/पक्षी/दिन की अनुपूरक भक्षण से अंडे का उत्पादन और अंडे का आकार काफी अधिक हो गया। फ़ीड लागत की गणना रु.20/- किग्रा होने पर, शुद्ध लाभ प्रति लाभार्थी पूरक आहार के कारण रु.1,790 अधिक था। पुरी जिले, ओडिशा के नीमापाड़ा ब्लॉक के चनपराड़ा और परींचापाड़ा गांवों में 40 फार्म परिवारों के एक समूह के साथ काम करने के माध्यम से आय बढ़ाने और कृषि परिवारों की पोषण सुरक्षा में सुधार के लिए एक पारिवारिक पोल्ट्री उत्पादन मॉडल विकसित किया गया था।

भा.कृ.अनु.प. और अन्य राष्ट्रीय संस्थानों द्वारा विकसित मछली प्रसंस्करण से संबंधित मौजूदा तकनीकों का दस्तावेजीकरण किया गया था और मछली प्रसंस्करण में उपलब्ध परिष्कृत प्रौद्योगिकियों के माध्यम से समाधान का परीक्षण करते हुए लिंग आधारित कठिन परिश्रम प्रवृत्त गतिविधियों का भी मूल्यांकन किया गया था। मछली प्रसंस्करण (एन=120) में शामिल महिलाओं को पानी के स्रोत की कमी, प्रौद्योगिकी की उच्च लागत, ऋण प्राप्त करने की लंबी और बोझिल प्रक्रिया और आधुनिक मछली प्रसंस्करण प्रौद्योगिकियों को अपनाने में उनके प्रमुख बाधाओं के रूप में विशेष बाजारों की कमी है। महिलाओं द्वारा अनुभव किए जाने वाले कठिन परिश्रम का मूल्यांकन 5 अंक के पैमाने पर किया गया था, जिसमें मछली के विपणन के दौरान कठिन परिश्रम अनुभव का उच्चतम स्कोर (28.01) था। कृषि महिलाओं की कृषि और बल के आधार पर डिस्क रेजर के दो मॉडल प्रतिरूप विकसित और परीक्षण किए गए थे। प्रतिरूप II, जो ऊंचाई (8-10 सेमी) और चौड़ाई (23-25 सेमी) के संबंध में स्वीकार्य लकीरें बनाने वाले टूल को संचालित करने के लिए पुश मोड में केवल एक व्यक्ति को साथ रखता है। माध्यमिक कृषि के माध्यम से आदिवासी खेत की महिलाओं की आजीविका में सुधार के रूप में, गंजाम जिले की आदिवासी महिलाओं को रागी, आम, टमाटर और काजू के प्रसंस्करण में तकनीकी हस्तक्षेप किया गया और लघु उद्यम स्थापित करने के लिए एक योजनाबद्ध मॉडल विकसित किया गया।

IRRI-CIWA सहयोगी परियोजना के तहत, 8 उत्पादक समूहों ने ओडिशा के कोरापुट जिले में चितरी डोरा किसान उत्पादक कंपनी के माध्यम से 1000 महिला किसानों को संसाधित और सुगंधित चावल का विपणन किया। ओडिशा के पुरी के सत्यबादी ब्लॉक में धान बीज के सुरक्षित भंडारण के लिए महिला किसानों को लगभग 500 IRRI सुपर बैग भी वितरित किए गए। ICAR-CIWA और महिंद्रा एंड महिंद्रा की सहयोगी परियोजना के तहत, मयूरभंज और कोरापुट के दो जिलों में 42 गांवों में क्लस्टर या ग्राम स्तर के संगठन द्वारा कस्टम हायरिंग केंद्र स्थापित किया गया था। संसाधन किसानों के माध्यम से ऑन-फार्म कौशल प्रदर्शन, क्लस्टर स्तर पर रिफ्रेशर प्रशिक्षण, वैज्ञानिकों के साथ संबाद सत्र, एक्सपोज़र भ्रमण और सेवा केंद्रों के साथ संपर्क ICAR-CIWA द्वारा प्रदान किया गया। 360 महिलाओं किसानों को कठिन परिश्रम कम करने वाले यन्त्र किट वितरित किए गए और प्रभावशीलता का भी अध्ययन किया गया। डीएसआईआर द्वारा वित्त पोषित परियोजना के तहत "मछली के लिए मूल्य जोड़ना: ओडिशा की ग्रामीण महिलाओं के लिए एक संभावित आजीविका विकल्प, ओडिशा के 150 शहरी उपभोक्ताओं का एक सर्वेक्षण करके मूल्य वर्धित उत्पादों (वीएपी) पर उपभोक्ता धारणा का अध्ययन किया गया। तीस प्रतिशत उपभोक्ताओं ने कहा कि अगर वे चिकन / शाकाहारी उत्पादों की तुलना में कीमतों में उपलब्ध हैं तो वे मछली के वीएपी उत्पाद खरीदने को तैयार होंगे। ओडिशा के पुरी जिले के अस्तरंग और पुरी सदर ब्लॉक से 20 अलग-अलग एसएचजी समूहों से चुने गए 200 मछुआरों के सर्वेक्षण के माध्यम से मछुआरों की अनुमानित व्यावसायिक आवश्यकताओं का अध्ययन किया गया था, जिसमें 100 प्रतिशत महिलाओं के लिए सबसे महत्वपूर्ण जरूरत के रूप में क्रेडिट को नोट किया गया था। एर्गोनॉमिक्स एंड सेफ्टी ऑन एग्रीकल्चर में AICRP के तहत, नव विकसित फ़सल बैग के लिए एक पूर्व और पश्च धारणा अध्ययन, शारीरिक परीक्षण और पोस्टुरल विश्लेषण किया गया था। प्रदर्शन के मूल्यांकन और महिलाओं के अनुकूल बिजली संचालित मूंगफली छिलने वाले यंत्र के आर्थिक विश्लेषण में उत्पादन क्षमता 12.12 किग्रा / घंटा, रुपये की विपठुन लागत में कमी दिखाई गई। मैनुअल स्ट्रिपर की तुलना में 0.37 / किग्रा और उपकरण की लागत में मौजूदा डिकोक्टर की तुलना में है जो केवल एक ऑपरेशन करता है (50 प्रतिशत की कमी)। कृषि महिलाओं के बीच मशीनीकरण के स्तर का आकलन करने के लिए एक प्रश्नावली विकसित की गई थी। एक्स्ट्रामुरल शोध योजोना के तहत "इंस्टूमेंटेशन मोड में इंस्टीट्यूट-इंडस्ट्री-स्टेकहोल्डर्स लिंकेज के माध्यम से लिंग संवेदी उद्यमिता का विकास", तीन प्रमुख क्षेत्रों अर्थात बागवानी, डेयरी और इंस्टीट्यूट-इंडस्ट्री-महिला किसानों की स्थापना के लिए फार्म और कृषि उपकरणों की पहचान की गई है। भा.कृ.अनु.प. के बाह्य अनुसंधान परियोजना के तहत चयनित कृषि आधारित उद्योगों में महिलाओं और लिंग संबंधी मुद्दों को समझने के लिए प्रत्येक क्षेत्र में 100 क्षेत्रों की महिलाओं की भागीदारी, उनकी भूमिका, जरूरतों, धारणाओं पर सर्वेक्षण किया गया।

गृह विज्ञान पर अखिल भारतीय समन्वित अनुसंधान परियोजना (एआईसीआरपी) के तहत अनुसंधान परियोजनाओं को ग्रामीण घरों के पारिवारिक जीवन में गुणात्मक परिवर्तन लाने के लिए सूक्ष्म और स्थूल पारिस्थितिकी प्रणालियों के भीतर पांच घटकों के तहत किया गया था। कम

ग्लाइसेमिक इंडेक्स (जीआई) वाले विभिन्न खाद्य समूहों के कुल 362 खाद्य पदार्थों का दस्तावेजीकरण किया गया था और मधुमेह के प्रबंधन के लिए कम जीआई खाद्य पदार्थों पर एक डेटाबेस तैयार किया गया था, जो सामान्य स्तर के भीतर रक्त शर्करा के स्तर को बनाए रखने और पूर्व में वापस लाने में प्रभावी पाए गए थे । उच्च पोषण/मोटापे के प्रबंधन के लिए स्थानीय रूप से उपलब्ध कार्यात्मक खाद्य सामग्री से उच्च फाइबर मल्टीग्रेन मिक्स के उत्पाद तैयार किए गए हैं। उच्च कैलोरी, उच्च प्रोटीन और माइक्रोन्यूट्रिएंट रिच सुविधा मिश्रण पर ध्यान देने के साथ मिश्रण का उपयोग करने के लिए तैयार क्षेत्र विशिष्ट पोषक तत्व घने पोषण के प्रबंधन के लिए स्थानीय रूप से उपलब्ध खाद्य प्रणालियों से विकसित किया गया था। प्रायोगिक समूह के शरीर के वजन को बढ़ाने के लिए पोषण संबंधी खाद्य मिक्स उत्पाद पाए गए। उच्च फाइबर खाद्य मिश्रण के व्यावसायीकरण के लिए दो समझौता ज्ञापनों पर हस्ताक्षर किए गए। मधुमेह व्यक्तियों के लिए आहार पर एक मोबाइल ऐप AAU, जोरहाट केंद्र द्वारा विकसित किया गया था।

कपड़ा घटक (टेक्सटाइल कंपोनेंट) के तहत स्थानीय स्तर पर उपलब्ध कम उपयोग किया गया फाईबर का उपयोग करके विभिन्न अंत उपयोगों के लिए उत्पादों के डिजाइन और विकसित करने का प्रयास किया गया था। इको बेस्ड फैब्रिक के उत्पाद जैसे कि खेल के लिए कपड़े और गैजेट्स, हाईजीन उत्पाद डिजाइन किए गए, विकसित किए गए और कार्यात्मक प्रदर्शन का मूल्यांकन किया और पाया कि उपचारित कपड़ों का पहनने वालों पर कोई प्रतिकूल प्रभाव नहीं पड़ता है। यूएएस, धारवाड़ पर एआईसीआरपी द्वारा आविष्कार "नर्सरीज़ के लिए बायोडिग्रेडेबल मेस्टा कम्पोजिट पॉट्स" पर एक पेटेंट दायर और प्रकाशित किया गया है। कृषि और संबद्ध क्षेत्रों में आईसीटी के संवर्धित उपयोग के लिए फार्म महिला ज्ञान समूहों (एफडब्ल्यूकेजी) को बढ़ावा देने पर एक अध्ययन किया गया है और इन गतिविधियों में आईसीटी उपकरणों के उपयोग को बढ़ाने के लिए, क्षमता निर्माण कार्यक्रमों का आयोजन किया गया, हस्तक्षेप पैकेजों को मान्य किया गया और उनकी प्रभावशीलता का परीक्षण किया गया। । जलवायु परिवर्तन के प्रभावों के कारण खेत महिलाओं द्वारा सामना की जाने वाली बाधाओं के आधार पर विभिन्न क्षेत्र विशिष्ट जलवायु हस्तक्षेप प्रदान किए गए थे।

कृषिरत महिलाओं के कार्य में कठिन परिश्रम की विशेषता कम करने और विभिन्न उत्पादन प्रणालियों में लिंग अनुकूल प्रौद्योगिकियों को बढ़ावा देने के लिए क्षेत्र परीक्षण किए गए थे। 11 उत्पादन प्रणालियों में कृषि महिलाओं के लिए 51 उन्नत तकनीकों की सिफारिश की गई है जो उत्पादन और दक्षता को बढ़ा सकती हैं और कठिन परिश्रम को कम कर सकती हैं। एर्गोनोमिक मूल्यांकन विभिन्न चयनित कृषि उद्यमों में किया है, जहां महिलाओं की भागीदारी महत्वपूर्ण थी। चयनित उद्यमों में महिला श्रमिकों के परिश्रम को कम करने के लिये इक्कीस (21) तकनीकों का विकास किया गया। "विवाहित महिलाओं की मनोवैज्ञानिक कल्याण के लिए प्रजनन स्वास्थ्य देखभाल" पर एक पैकेज विकसित किया गया था। ग्रामीण परिवारों के लिए पेरेंटिंग इंडेक्स (पीआईआरएफ) के निर्माण के लिए, इंडेक्स बनाने के लिए विश्लेषण किए गए विभिन्न मापदंडों पर विचार करके 6428 परिवारों से डेटा एकत्र किया गया था। बच्चों के विकासात्मक परिणामों पर पेरेंटिंग प्रथाओं के प्रभाव का भी आकलन किया गया। यूएएस, धारवाड़ केंद्र द्वारा पेरेंटिंग पर एक मोबाइल ऐप भी विकसित किया गया था।

अन्य गतिविधियों के अलावा, संस्थान ने "लिंग अंतराल और कृषि में लैंगिक मुद्दों के समाधान के लिए हस्तक्षेप" पर दस दिनों का भा.कृ.अनु.प. द्वारा प्रायोजित लघु पाठ्यक्रम भी आयोजित किया; CUTM, परलाखेमुंडी, ओडिशा की बी.टेक छात्रों के लिए तीन महीने का इंटर्नशिप प्रोग्राम और ATMA, वलसाड, गुजरात द्वारा प्रायोजित चार दिनों के प्रशिक्षकों के प्रशिक्षण कार्यक्रम आयोजित किया। संस्थान द्वारा विकसित प्रौद्योगिकी को लोकप्रिय बनाने के लिए संस्थान ने देश भर में विभिन्न प्रदर्शनियों में भाग लिया है। संस्थान ने अंतर्राष्ट्रीय योग दिवस, पार्थेनियम जागरूकता सप्ताह, महिला किसान दिवस, विश्व खाद्य दिवस, संविधान दिवस और नागरिक कर्तव्य अभियान, कृषि शिक्षा दिवस, कृषि दिवस में महिलाएँ और हिंदी पखवाड़ा मनाया और पूर्वी क्षेत्र के लिए खेल प्रतियोगिता में भाग लिया। विस्तार कार्यक्रमों के एक हिस्से के रूप में, संस्थान ने मेरा गाँव मेरा गौरव, अनुसूची जाति सब योजोना प्रोग्राम और स्वच्छ भारत अभियान, अपने गोद लिए गाँवों में आकांक्षी जिला योजना विकास का आयोजन किया। संस्थान ने कई कौशल आधारित प्रशिक्षण, क्षमता निर्माण कार्यक्रम आयोजित किए। 2243 किसानों (1942 महिलाओं और 301 पुरुषों) को लाभान्वित करने वाली और कृषि में महिलाओं को सशक्त बनाने के लिए कार्यशालाएं, एक्सपोजर भ्रमण और संबाद SCSP कार्यक्रमों के हिस्से के रूप में, 591 अनूसुचित जाती महिला लाभार्थियों को उन्नत किस्मों के बीज, कृषि उपकरण और मछली पकड़ने के जाल जैसे सामान भी वितरित किए गए।

इस वर्ष में संस्थान से 16 शोध पत्र, छह लोकप्रिय लेख, एक तकनीकी बुलेटिन, दो संकलन और एक फ़ोल्डर प्रकाशित हुए हैं। गृह विज्ञान पर AICRP के तहत, देश भर के 13 केंद्रों से 101 शोध लेख प्रकाशित किए गए थे। संस्थान के दो वैज्ञानिकों को नेपाल के काठमांडू में आयोजित सार्क की विशेषज्ञ बैठक और क्षेत्रीय सम्मेलन में भाग लेने के लिए प्रतिनियुक्त किया गया था। ICAR-CIWA को वैश्विक शिक्षा और आर्थिक विकास मंच द्वारा एशिया क्षेत्र (भारत) में कृषि और संबद्ध गतिविधियों में उत्कृष्टता के लिए बेस्ट वीमेन एम्पावरमेंट इंस्टीट्यूट इन एशिया अवार्ड-2019 के रूप में मान्यता दी गई। संस्थान ने भा.कृ.अनु.प. अनुसंधान डेटा प्रबंधन दिशानिर्देशों को लगातार कार्यान्वित करने और 2013-18 के लिए अपने सभी प्रकाशनों और प्रौद्योगिकियों को कृषि पोर्टल में अपलोड करने के लिए प्रशंसा प्रमाण पत्र प्राप्त किया है।

Executive Summary

ICAR-Central Institute for Women in Agriculture (ICAR-CIWA) is an institution first of its kind in the world that is exclusively devoted to gender related research in agriculture. ICAR-CIWA has a mandate of undertaking research on gender issues in agriculture and allied fields, gender-equitable agricultural policies/ programmes and gender-sensitive agricultural-sector responses and co-ordinating research on Home Science through its AICRP centres spread across 12 states in India. Working through its mandate, the Institute has the vision to emerge as a leading centre for gender research and serve as a catalyst for gender mainstreaming and women empowerment in agriculture to realize enhanced productivity and sustainability of agriculture. The Institute's primary activities include standardization of methodologies for livelihood analysis and developing vulnerability framework for farm women, technological interventions for livelihood security, skill and entrepreneurship development of women, management of operational drudgery for farm women and striving for food and nutritional security of farm families including water, health and sanitation. During the year 2019, the Institute implemented seventeen institutional research projects and eight externally funded projects. The salient research achievements of the Institute is summarised here.

The Institute has taken an initiative to develop the technology hub and gender sensitization micro-lab in order to highlight the contribution of women in agriculture work participation and malnutrition scenario, photo gallery of rural women, daily activity clock, women centric government initiatives, technologies in drudgery reduction and success stories through "Voice of Women". A questionnaire for pre and post evaluation of gender sensitiveness of visitors has been developed. Fifty eight technologies out of 600 technologies collected from different parts of the country were found suitable for farm women through the checklist prepared with the majority number of technologies (24) under farm power and machinery. Designing and development of Gender Sensitive Agri-Nutri (GSAN) farming system model was undertaken in Sankilo and Tentalpur villages of Nischintakoili block, Cuttack, Odisha. Bench mark survey of participating farm women (120) on their profile, dietary pattern, involvement and benefit from four identified modules (crop-based, horticulture-based, animal-husbandry based and enterprise-based modules) and gender relation through interview schedule was carried out to understand the women and gender issues. It could be observed that most of the problems were related to state departments, hence, it is suggested that necessary policy measures may be taken up by the government to address the farm women's problems and issues. With an aim to develop gender sensitive model for doubling farmers' income, technological and developmental gaps were analysed by experts and logical technological modules were designed. The need based modules were demonstrated through training, demonstrations, capacity building programmes, input support and advisory services, promoting high yielding varieties and hybrids through 16 programmes covering 125 farm families. A web based dynamic database was developed for generating data tables related to state wise gender work participation in agriculture. The Gender Knowledge System technology format was shared with Krishi team for incorporation of gender component into the technology database of ICAR to ease the process of data collection and compilation. Online data entry and database platform was created for uploading publication of AICRP (Home Science) on Krishi portal.

Nutritional interventions for enhancing the protein consumption of farm families of Semla village of Umarkote Block, Nabrangapur, an aspirational district was made by introducing the cultivation of high yielding variety of black gram variety PU 31 to capitalize on the residue moisture available after paddy cultivation as paira cropping. The intervention had a positive impact on the Chronic Energy Deficiency where it showed a decrease to the tune of 4.53 percent and 6.59 percent in women and men respectively. To improve women's health condition involved in household chores, terafil water filter and smokeless chulhas were also distributed. Various intercropping models suitable for mango orchards have been demonstrated in a participatory mode to cater to the financial and nutritional requirements of 55 farm families in 2 villages of aspirational district Mayurbhanj. A sustainable livelihood index was developed in which pineapple as intercrop got the highest score (86.6). Pineapple proved to be the best intercrop in terms of environmental conservation, input recycling, employment generation and income enhancement.

To understand the impact of establishment of milk producers' cooperative, Khalagaon Milk Producer Co-operative Society (MPCS) was selected and its activities were analyzed and mapped. The Khalagaon MPCS has a total of 161 members of which only 10 are female. The society generated revenue of Rs.62.76 lakh for its members by collecting 2.37 lakh litres of milk (2018-19). On an average, the members earned Rs.5082/- per month. The average milk price was Rs.26.48 per litre. A field study was conducted to assess the effect of critical supplementation of mineral mixture in

lactating crossbred and it resulted in improved milk yield by 14.5 percent with significantly enhanced reproductive efficiency. The net return over feed cost and feed efficiency was improved by 21 and 12 percent in mineral supplemented group, respectively. A similar study was conducted in goats which resulted in improved number of services per pregnancy, reduced post parturient complications predominantly abortion (30%), retention of placenta and dystokia (10%) in mineral mixture supplemented group. Female agriculture work participation (as percent of population) were calculated for all the 640 districts and thematic maps were generated using QGIS3.10. Thematic map for female agriculture work participation was overlaid with 15 agro-climatic regions (ACR) for analysing the spatial distribution of female agricultural workers across different ACR. The analysis of gender roles and needs in the homestead aquaculture was analysed and social acceptance, support from counterpart/ family members, technological knowhow on polyculture of small indigenous fishes with Indian Major Carps, timely availability of quality seed and availability of credit were perceived as most important by all the women farmers. In polyculture of Indian Major carps with small indigenous fishes, an average production of 298.2kg of IMC was obtained from 0.17 ha water area (which was around 80kg-130kg/0.17 ha prior to project) and a net profit of Rs 20,560/-. On an average, 174kg vegetables were harvested from the trellis system around ponds and pond bunds with a monthly income of Rs.6,419/- (pond area ranging from 0.08-0.22ha). Women friendly gill nets introduced to facilitate regular biweekly harvesting of small indigenous fishes resulted in a harvest of 200-750gm/15 days which was entirely used for home consumption. A study was conducted to study the effect of supplementary feeding on production performance of Vanaraja laying hens and income of farm women reared under extensive system of production. Supplementary feeding @ 35g/bird/ day during 16-40 weeks of age resulted in significantly higher egg production and egg size. Calculating the feed cost at Rs.20/kg, the net return was higher by Rs.1,790 per beneficiary (n=20) due to supplementary feeding. A family poultry production model was developed for enhancing income and improving nutrition security of farm families through working with a cluster of 40 farm families in Chanrapada and Parichanrapada villages of Nimapada block of Puri district, Odisha.

The existing technologies related to fish processing developed by ICAR and other national institutions were documented and also assessed the gender based drudgery prone activities, testing the solution through available/ refined technologies in fish processing. Women involved in fish processing (n=120) ranked lack of water source, high cost of technology, lengthy and cumbersome procedure of getting credit and lack of exclusive markets as their prime constraints in adoption of modern fish processing technologies. Drudgery experienced by women was assessed on a 5 point scale, with the highest score given to drudgery experience during marketing of fish (28.01). Two model prototypes of disc ridger based on the anthropometry and strength of farm women were developed and tested. Prototype II, which accomodate only single person in pushing mode to operate the tool formed acceptable ridges with respect to height (8-10 cm) and width (23-25 cm). As a part of livelihood improvement of tribal farm women through secondary agriculture, technological interventions in the processing of ragi, mango, tomato and cashew nut was given to tribal women of Ganjam district and a schematic model for establishing small scale enterprise was developed.

Under the IRRI-CIWA collaborative project, 8 producer groups mobilizing 1000 women farmers processed and marketed aromatic rice through Chitri Dora farmers producer company in Koraput district of Odisha. Around 500 IRRI super bags were also distributed to women farmers for safe storage of paddy seeds at Satyabadi block, Puri, Odisha. Under the collaborative project of ICAR-CIWA and Mahindra & Mahindra, custom hiring centre was set up by the cluster or village level organization in 42 villages in two districts of Mayurbhanj and Koraput. On-farm skill demonstration through resource farmers, refresher trainings at cluster level, interactive session with scientists, exposure visits and linkage with service/ repair centres was imparted by ICAR-CIWA. Drudgery reducing tool kits were distributed to 360 women farmers and effectiveness was also studied. Under the DSIR funded project on "Adding value to fish: a potential livelihood option for rural women of Odisha", consumer perception on value added products (VAP) were studied by conducting a survey of 150 urban consumers of Odisha. Thirty percent consumers opined that they are willing to buy VAP products of fish if they are available in prices comparable to that of chicken/veg products. Perceived occupational needs of fisherwomen were studied through survey of 200 fisherwomen selected from 20 different SHG groups from Astaranga and Puri Sadar Blocks of Puri District, Odisha, in which credit was noted as the most important need by 100 percent women. Under AICRP on Ergonomics and Safety in Agriculture, a pre and post perception study, physiological test and postural analysis was done for newly developed harvest bag. Performance evaluation and economic analysis of the women friendly power operated groundnut stripper cum decorticator showed an stripping output capacity of 12.12 kg/hr, reduction in stripping cost of Rs. 0.37/kg compared to manual stripper and 50 percent reduction in cost of equipment as compared to existing decorticator which performs only one operation. A questionnaire to develop a scale for assessing level of mechanisation among farm women was developed. Under the extramural research project "Development

of gender sensitive entrepreneurship model through institute-industry-stakeholders linkage in convergence mode", three major sectors *viz*., horticulture, dairy and farm implements for establishing institute-industry-women farmers' linkage have been identified and a survey of participating 100 farm women from each sectors was conducted on their role performance, needs, perceptions to understand the women and gender issues in selected agro-based industries.

The research projects under All India Coordinated Research Project (AICRP) on Home Science were carried out under five components within the micro and macro ecosystems to bring about qualitative changes in family life of rural households. A total of 362 foods from different food groups having low Glycemic Index (GI) were documented and a database on low GI foods for the management of diabetes was prepared which were found to be effective in maintaining blood sugar levels within normal levels and in reverting pre-diabetic status. The products of high fibre multigrain mix have been formulated from locally available functional food ingredients for management of over nutrition/obesity. Region specific nutri-dense ready to use mix with focus on high calorie, high protein and micronutrient rich Convenience Mix was developed from locally available food systems for management of under nutrition. The nutridense food mix products were found to increase the body weight of experimental group. Two MoUs were signed for commercialization of high fibre food mix. A mobile app on diet for diabetic persons was developed by AAU, Jorhat Centre.

An effort was made to design and develop products for various end uses using locally available underutilized fibres under textile component. Products of the eco-based fabric such as clothing and gadgets for sportech, hygiene products were designed, developed and evaluated for functional performance and found that treated fabrics have no adverse effects on wearers. A patent on "Biodegradable Mesta Composite Pots for Nurseries" invented by AICRP on HS, UAS, Dharwad, has been filed and published. A study on promoting Farm Women Knowledge Groups (FWKGs) for enhanced use of ICT in agriculture and allied sectors has been undertaken and to enhance the use of ICT tools in these activities, capacity building programmes organized, intervention packages were validated and tested for their effectiveness. Based on the constraints faced by the farm women due to the effects of climate change, different region specific climate interventions were provided.

Drudgery was characterized and field trials were conducted for promotion of gender friendly technologies in different production systems. Fifty one (51) improved technologies have been recommended for farm women in 11 production systems which can enhance the production and efficiency and reducing drudgery. Ergonomic assessment has been carried out in different selected agro enterprises, where the extent of involvement of women was significant. Twenty one (21) technologies were developed for reduction of drudgery of women workers in the selected enterprises. A package on "Reproductive health care for psychological wellbeing of married women" was developed. For development of Parenting Index for Rural Families (PIRF), data were collected from 6428 families by considering different parameters analysed for making Index. Effect of parenting practices on developmental outcomes of the children was also assessed. A mobile app on parenting was developed by UAS, Dharwad Centre.

Among other activities, the Institute also organized a ten days ICAR sponsored short course on ''Gender gaps and interventions to address gender issues in agriculture''; three months Internship programme for B. Tech. Agriculture Engineering students of CUTM, Paralakhemundi, Odisha and four days trainers' training programme sponsored by ATMA, Valsad, Gujarat. The Institute has participated in various exhibitions across the country to popularize the technology developed by the Institute. The Institute also celebrated International Day of Yoga, Parthenium Awareness Week, Mahila Kisan Diwas, World Food Day, Constitution Day and Citizens' Duties Campaign, Agricultural Education Day, Women in Agriculture Day, Hindi Pakhwada and participated in sports tournament for Eastern Zone. As a part of the extension programmes, the Institute carried out Mera Gaon Mera Gaurav, Schedule Cast Sub Plan Programme and Swachh Bharat Abhiyan Programme in its adopted villages. The Institute organized a number of skill based training, capacity building programmes, workshops, exposure visits and interface meeting for empowering women in agriculture benefiting 2243 farmers (1942 women and 301 men). As part of the SCSP programmes, inputs like seeds of improved varieties, farm tools and fishing nets were also distributed to 591 SC women beneficiaries.

The Institute has published 16 research papers, six popular articles, one technical bulletin, two compendiums and one folder during the period. Under AICRP on Home Science, 101 research articles were also published from 13 centres across the country. Two Scientists of the Institute were deputed to attend expert meeting and regional conference of SAARC held in Kathmandu, Nepal. ICAR-CIWA was recognized as 'Best Women Empowerment Institute in Asia Award - 2019' for excellence in agriculture & allied activities in the field of women in agriculture in Asia Region (India) by Global Education & Economic Development Forum. The Institute has also received Certificate of Appreciation for proactively implementing ICAR Research Data Management Guidelines and uploading all its publications and technologies for 2013-18 in KRISHI portal.

1. INTRODUCTION

1.1 Historical Perspective

The Working Group on Agricultural Research and Education, constituted by the Planning Commission for the formulation of the 8th Five Year Plan (1992-97), recommended the establishment of a "National Research Centre for Women in Agriculture" (NRCWA). Accordingly, the NRCWA was established in April 1996, at Bhubaneswar (Odisha) under Indian Council of Agricultural Research, New Delhi. Keeping in view the role of women in integration of farm and household activities, All India Coordinated Research Project on Home Science (AICRP on HS) started in the 6th Five Year Plan (1980-85) was merged with NRCWA in the year 2007. The NRCWA was further upgraded as "Directorate of Research on Women in Agriculture" (DRWA) in the year 2008. The Directorate has been upgraded and renamed as 'ICAR-Central Institute for Women in Agriculture' (ICAR-CIWA) in the year 2014 under 15th Expenditure Finance Committee meeting of 12th Five Year Plan (2012-17). Since its inception, the Institute has been undertaking research on issues affecting women and their opportunities in agriculture. It is focussing on participatory action research in different technology based thematic areas involving farm women to test suitability of farm technologies for them and suggest refinement. The Institute is also working to catalyze and facilitate research and development institutions to bring farm women perspectives in their research and development programmes.

Vision

Emerge as a leading centre for gender research and serve as a catalyst for gender mainstreaming and women empowerment in agriculture to realize enhanced productivity and sustainability of agriculture.

Mission

Generate and disseminate knowledge to promote gender sensitive decision making for enhancing efficiency and effectiveness of women in agriculture.

Mandate

- Research on gender issues in agriculture and allied fields.
- Gender-equitable agricultural policies/ programmes and gender-sensitive agricultural-sector responses.
- Co-ordinate research on Home Science.

Objectives

- Undertake studies to assess agricultural technologies, programmes, institutions and policies to refine these with a gender perspective;
- Create and maintain gender disaggregated databases to understand the dynamics and the effect of gender roles in different agro-ecological and production systems for strategic planning;
- Characterize and understand drudgery and safety related issues of farmwomen and improve their work efficiency;
- Develop gender sensitive, resilient and sustainable agricultural models and institutional innovations for nutrition and livelihood security;
- Documentation and knowledge management of gender studies in agriculture;
- Capacity building of various stakeholders to address gender issues in agriculture.

Thrust Areas

- Technology Assessment and Refinement
- Livelihood & Socio-economic Policy
- Drudgery and Vulnerability
- Natural Resources Management
- Food and Nutritional Security including Water, Health and Sanitation
- Extension Systems, Grass-root Institution and Capacity Building

Ongoing activities of ICAR-CIWA

The ICAR-CIWA serves as a unique Institute to address issues related to women in agriculture in the areas of integrated farming system, integrated pest management, drudgery, livestock, fisheries and extension methodologies. Empowerment of the women in agriculture is one of the key themes in the mandate of the Institute right from its inception. Since women in agriculture is an emerging area of research, capacity building of all the stakeholders were organized through various workshops, trainings and sensitization programmes for development functionaries, research scientists/ managers, teachers and KVKs scientists/ SMSs who are directly or indirectly associated with farm women empowerment by ICAR-CIWA at different places in the country.

The Institute had privilege to have very eminent professionals in the Research Advisory Committee. They provide guidance and encourage the scientists to carry out need based research programmes according to the mandate. The Institute Management Committee (IMC) is constituted and mandated by the ICAR, which supervises the functioning of the Institute. Besides these there are a number of internal committees and cells for running an efficient and decentralized management of the Institute. At the Institute level, the Institute Joint Staff Council (IJSC) promotes healthy interaction and congenial work environment among the personnel. The Director conducts regular discussions/meetings with scientific, technical and administrative staff to discuss various problems and difficulties and obtain their suggestions for the smooth functioning of the Institute.

1.2 Infrastructure Facilities

a) **Agricultural Knowledge Management Unit:** The Institute has a well developed Agricultural Knowledge Management Unit with facilities of internet and latest data analysis software like SAS and SPSS. The whole Institute is having round the clock broadband/ optical fibre cable based internet connectivity over Local Area Network.

Institute Website (www.icar-ciwa.org.in)

The site contains information about manpower, Institute mandate, staff profile, project details, publications, event archives, tenders & job announcements *etc*. The report on events organized by the Institute, staff recruitments, tender notices, forthcoming events and other circulars of the Institute are regularly updated in the Institute website. Recent information remain on the 'Home Page' and are moved to 'Archive' after a period of one month.

b) **Video Conferencing System**: It has a multipoint HD video conferencing system which supports IP connectivity. It also has a high definition video conferencing camera with high optical zoom supporting various formats, microphone (3 nos.), full HD professional display. It has been installed at Director's Committee Room having capacity of about 30 Persons. IP Address of video conferencing at ICAR-CIWA Bhubaneswar is 117.247.70.4.

c) **Class Rooms:** The Institute has a conference hall with seating capacity of 150 and two committee rooms with seating capacity of 40 each in addition to a well equipped training hall with the provision of LCD and other audio-visual aids.

d) **Gender Knowledge System in agriculture portal:** It is a single window knowledge system on gender related information, databases, research, technologies, *etc*. in agriculture for the benefit of policy makers, researchers, development & extension workers, teachers and students.

e) **Institute farm:** The Institute has a research farm of 32 acres including 15 acres area under different horticultural and field crops as well as livestock & fisheries. The Institute has well developed demonstration units for various agro-enterprises including horticulture based cropping models, vermicomposting unit, integrated fish-poultry-duck-unit and ornamental fish unit. Irrigation facility has been expanded to the entire farm area with well laid road connectivity to each research plot. Intensive cultivation has been taken up in the research and demonstration plots with remunerative crops like banana, pine apple, cashew nut and backyard poultry. New initiatives like large scale multiplication of planting materials of guava, mango, cashew nut and pineapple have also been taken up to promote revenue generation.

f) **Institute Technology Management Unit:** As per the revised ICAR guidelines for Intellectual Property Right and Technology Transfer/ Commercialization (2018), the Institute Technology Management Committee (ITMC) chaired by the Director of the Institution, is the final decision making body for IP related matters/ progress/ concerns. Institute Technology Management Unit (ITMU) works as secretariat for ITMC at ICAR-CIWA. ITMU committee meeting was held on 28 May, 2019 to discuss about the patent application on "Biodegradable Mesta Composite Pots for Nurseries" invented by UAS, Dharwad, one of the AICRP on Home Science Centres. The Scientists were sensitized periodically about the various IPR issues from time to time. A proforma on IPR related queries was developed and circulated among the Scientists. A MoU was signed with National Innovation Foundation-India, Ahmedabad and ICAR-CIWA, Bhubaneswar on 30 July, 2019 to achieve the common goal of strengthening the innovative women farmers.

g) **Laboratory:** Well equipped laboratories in the field of agronomy, entomology, ergonomics, post harvest technology, horticulture, seed technology, animal science, fisheries and gender data centre are available in the Institute.

h) **Library**: The Institute has over 2000 books/ research journals/ CAB CD ROM database, Agricola database in the field of gender and women studies to facilitate researchers and students. Library automation software with web OPAC is available for easy retrieval and issue of books and journals to

the subscribers. The institute has subscribed online Indiastat database through which researchers can have access to a number of datasets. A total of ten (10) ISBN numbers are reserved for the Institute by the Raja Rammohun Roy National Agency for ISBN, Department of Higher education, Ministry of Human Resource Development, Government of India to be used for future publications.

Consortium for e-resources in agriculture (CeRA): It is a web based application to facilitate online access and sharing of journal literature subscribed by the participating libraries of the consortia. The facility of e-consortium of agricultural libraries is available in the Institute.

i) **Residential quarters:** There are 13 residential quarters in the Institute campus with Type-VI (1), Type-V (2), Type-IV (2), Type-III (6) & Type-II (2) quarters.

j) **Trainees' hostel:** The trainees' hostel can accommodate 25 participants for various training programmes.

k) **Women farmers hostel**: The women farmers' hostel can accommodate 28 women participants for various training programmes.

l) **Technology block**: The technology block has an exhibition cum meeting room with a seating capacity of approximately 300 persons, while the training cum conference hall can accommodate approximately 100 persons.

1.3 Staff strength, budget and expenditure and resource generation

The information pertaining to the staff strength, budget and expenditure and resource generation of ICAR-CIWA for the year 2019 are given in the following tables:

Table 1.3.1 **Details of cadre strength as on 31.12.2019 (ICAR-CIWA)**

S. No.	Category	Post	Sanctioned	Filled	Vacant
1.	Research Management Position	Director	1	0	1
		Head, Division of Agricultural Technologies for Women	1	0	1
		Head, Division of Gender, Family and Community Studies	1	0	1
2.	Scientific Staff	Principal Scientist	3	1	2
		Senior Scientist	9	6	3
		Scientist	6	10	-4
3.	Technical Staff	Senior Technical Officer	1	1	0
		Technical Assistant	11	10	1
		Technician	1	1	0
4.	Administrative Staff	Administrative Officer	1	1	0
		Assistant Administrative Officer	1	1	0
		Assistant Finance and Accounts Officer	1	1	0
		Private Secretary	1	1	0
		Personal Assistant	1	0	1
		Assistant	2	0	2
		Senior Clerk	1	1	0
		Stenographer Grade-III	1	1	0
		Junior Clerk	2	2	0
5.	Supporting Staff	Skilled Supporting Staff	1	1	0
Total			**46**	**38**	**8**

Table 1.3.2 **Total budget and expenditure (₹. in lakhs) during 2019-20 (ICAR-CIWA)**

Sl. No.	Head of Account	BE	RE	Expenditure
A.	**Non – Recurring**			
1	Works	470.00	468.90	468.41
2	Equipments	10.00	62.00	61.69
3	Information Technology	5.00	1.50	1.10
4	Library Books & Journals	5.00	3.50	3.33
5	Vehicles & Vessels	0.00	0.00	0.00
6	Livestock	5.00	0.10	0.09

Sl. No.	Head of Account	BE	RE	Expenditure
7	Furniture & Fixtures	5.00	5.00	4.68
8	SCSP Capital	100.00	10.00	9.99
9	Disaster & Emergency Fund (Cyclone 'FANI') Capital	0.00	49.00	48.93
	Sub Total (A)	**600.00**	**600.00**	**598.22**
B.	**Recurring**			
10	Establishment Charges	602.89	530.00	528.74
11	Traveling Allowances	31.00	7.60	7.52
12	Research & Operational Expenses	225.00	94.35	94.13
13	Administrative Expenses	188.00	93.27	93.13
14	H.R.D	6.00	4.78	4.78
15	SCSP General	100.00	22.00	21.57
	Sub Total (B)	**1252.89**	**752.00**	**749.87**
	Grand Total (A+B)	**1752.89**	**1352.00**	**1348.09**

Table 1.3.3 **Total budget and expenditure (₹. in lakhs) during 2019-20 (AICRP on Home Science)**

Sl. No.	Head of Account	BE	RE	Expenditure
A.	**Non – Recurring**			
1	Equipments	154.09	122.00	118.61
	Sub Total (A)	**154.09**	**122.00**	**118.61**
B.	**Recurring**			
2	Establishment Charges	1597.23	1597.23	1597.23
3	Traveling Allowances	31.75	31.75	31.60
4	Research & Operational Expenses	748.30	491.79	491.58
	Sub Total (B)	**2377.28**	**2120.77**	**2120.41**
	Grand Total (A+B)	**2531.37**	**2242.77**	**2239.02**

Note: BE: Budget Estimate; RE: Revised Estimate; EXP: Expenditure

Table 1.3.4 **Revenue generation during 2019 (ICAR-CIWA)**

Sl. No.	Head of account	Amount in Rupees
1.	Sale of farm produce	331029.00
2.	Licence fee	87010.00
3.	Guest House charges	307756.00
4.	Interest earned on loans & advances	12113.00
5.	Receipts from schemes	124164.00
6.	Diploma Charges/Registration fee/Training fees/Course fees etc.	110850.00
7.	Interest earned on short term deposits	4839100.00
8.	Other (Specify the source), Tender fee	40000.00
9.	Electricity and water charges	134932.00
10.	Recoveries of Loans & Advances	2000.00
11.	Miscellaneous Receipts (Penal interest/misc. receipts)	5048.00
	Total	5994002.00

1.4 Right to Information (RTI)

Transparency was facilitated through *suo moto* disclosures of information made through Institutes website. A total of ten queries under Right to Information Act were replied during the period.

Table 1.4.1 **RTI- Annual Report for the Period 2019**

Category	Total Number of applications received	Number of applications received		Number of cases transferred to other PAs	Decisions where requests/ appeals accepted	Amount of Regn. Fee collected (Rs.)
		Directly from the applicants	Transferred from other PAs			
Requests	10	10	Nil	Nil	10	100

2. RESEARCH ACHIEVEMENTS

2.1 RESEARCH ACHIEVEMENTS (ICAR-CIWA)

2.1.1 Engendering agricultural research and extension through gender sensitization technology hub

Sabita Mishra, Ananta Sarkar, L. P. Sahoo, G. Moharana

Technology collection: The technologies collected from ICAR Institutes/SAUs were screened and finally 58 technologies were found suitable for farm women out of total collected 600 under project. Parameters considered for collection of technologies are name of the technology, technology description, how it is women friendly, performance, locale of dissemination/ application, photographs, source, whether developed/ tested/ refined, year of development and unit cost.

The selected technologies were found to be available in nine states covering Odisha (8), Punjab (2), Haryana (6), Uttarakhand (3), Rajasthan (11), Himachal Pradesh (8), Maharastra (7), Madhya Pradesh (2) and Karnataka (11). It was also theme wise categorized and found that more number of technologies is from farm machinery (24) followed by food and nutrition (15), cloth and textile (11), horticulture (4), crop protection (3) and fisheries (1).

In-house Brainstorming Workshop for Techno-Hub and Gender Sensitization Micro-Lab (GSM Lab): An in-house brainstorming workshop was conducted on 13 September, 2019 at the Institute to develop a blue print and chalk out the plan for developing the Techno-Hub and Gender Sensitization Micro-Lab. The valuable inputs given by the Scientists were recorded and work plan was developed. Accordingly, the project team visited different agricultural museums like ICAR-NRRI, Cuttack, ICAR-NASC Complex, New Delhi, ICAR-Directorate of Groundnut Research, Junagarh and Jungarh Agricultural University, Junagarh to get first hand information and developed the work participation and malnutrition scenario, photo gallery of rural women, daily activity clock, government initiatives, technologies in drudgery reduction, documentation of women entrepreneurs and development of questionnaire for pre and post evaluation of gender sensitiveness of visitors.

Interaction programme: Conducted an interaction programme between scientists and farm women/ farmers in Guapur village of Balipatna block under Khordha district on 29 November, 2019. About 70 women participated in the programme. During the event, advisory services to farm women/ farmers for replacement of old variety with paddy (Swarna Sub-1), vegetables (high yielding tomato, cauli flower, beans, brinjal, etc.), banana (G-9), lemon (Kagji lembu), papaya (Honey Dew) and drumstick, insect pest control, judicious utilization of water and land, care of animal resources, health and nutritional care of women and children were provided.

Documented "Voice of Farm Women": The success of technologies were documented through "Voice of Farm Women" in which the women of Nuasahi village of Satyabadi block under Puri district have highlighted the benefits through technological interventions in agriculture made by ICAR-CIWA including mushroom cultivation, backyard poultry rearing, rice farming, vegetable production and vermi compost by waste utilization.

Gender Sensitization Micro-Lab (GSM-Lab): The concept of GSM Lab has been finalized based on which various posters, charts, videos, publications, etc. were developed and collected as sensitizing materials to sensitize the visitors of GSM-Lab to enable them in formulating projects/ programmes/ policies with women perspective.

2.1.2 Designing and development of Gender Sensitive Agri-Nutri (GSAN) farming system model

Lipi Das, S. K. Srivastava, B. Sahoo, P. Jakhar, S. Swain, T. Seth

Designing and development of gender sensitive agri-nutri (GSAN) farming system model was undertaken in Sankilo and Tentalpur villages of Nischintakoili block of Cuttack. Bench mark survey of participating farm women (120) on their profile, dietary pattern, involvement and benefit from four identified modules (crop-based, horticulture-based, animal-husbandry based and enterprise-based modules), gender relation etc. through interview schedule was carried out to understand the women and gender issues. Dietary pattern of majority of farm women of the two villages was based on roti+vegetables during breakfast; rice+dal+veg during lunch and roti+veg during dinner. Nearly 87 percent of farm families adopted Pooja variety followed by Swarna Sub-1 (74.2%) in rice farming. In case of black gram and green gram, majority had adopted local variety especially for better taste and cooking quality. About

92 percent of farm families were involved in cultivating solanaceous fruit vegetables mainly tomato, brinjal, chilli, followed by cole crops (81.7%). About 74 percent of farm families were cultivating peas and beans. The farm families were also involved in cultivating high value crops *viz.*, capsicum, broccoli, cherry tomato, red cabbage etc. The green and leafy vegetables were cultivated by the farm families in their kitchen garden instead of main fields.

Dairy-based income source was mainly from cow. The household milk utilization pattern indicated that the quantity of milk sold by the beneficiary was recorded to 77.28 percent; out of the total retained quantity, 9 percent was used for preparation of value added products *viz.*, curd, ghee, paneer etc. and 13.63 percent was usually kept for home consumption. Efforts are needed to prepare more value added products from milk for enhancing income and improving family nutrition.

Table 2.1.1 **Nutritional Benefits of Paddy Straw Mushroom Farming (n=30)**

Production Class	Freq (%)	Yield/ bed (Kg)	Avg bed/ family	Yield/ family (Kg)	Sold (Kg)	Retained (Kg)	*Nutritional benefits per person (for the family of 5)*					
							Water (gm)	*Energy (Kcal)*	*Protein (gm)*	*Fat (gm)*	*Fibre (gm)*	*Iron (mg)*
Upto 1 Kg/bed	7 (23.3)	1	6	6.0	5.5	0.5	89.9	31.9	3.8	0.7	2.5	1.43
1-2 Kg /bed	17 (56.7)	1.75	8	14.0	13.0	1.0	179.8	63.8	7.6	1.4	5	2.86
More than 2 Kg/bed	6 (20.0)	2.5	8	20.0	18.0	2.0	359.6	127.6	15.2	2.8	10	5.72

Nutritional benefits of paddy straw mushroom indicated that the intake of various nutrients by the family members was found to be highest in the production class category of more than 2kg/bed and lowest for the category i.e., upto 1kg/bed suggesting that increase in productivity level may likely to increase the household nutrient consumption. Hence, steps are required to improve the knowledge and skill of the farm women to practice mushroom farming for income generation and providing household nutritional security.

Interaction with the farm women during benchmark survey

Majority of women were consulted during major decision-making process in farm management activities like varietal selection, irrigation, sale of produce and financial management, but rarely consulted in plant protection measures, fertilizer application and buying of farm equipments. But unfortunately, their suggestions were hardly accepted by their male counterparts. Almost all the farmwomen showed their interest in accessing productive resources for involvement in crop-based activities like labour, capital, inputs, technologies etc. About 47 percent succeeded in accessing the land and 40 percent of farm women accessed up to 100 percent of the family capital. These were some positive indications of gender friendly social climate.

Among several problems being encountered by the farm women, farming as laborious and tiring (with 79.83% weighted score) was the most severe closely followed by lack of women friendly tools and equipments (78.67%), access to credit (78%), local market for produce (74.83%), availability of space (74.67%) and lack of storage facilities (with 73% weighted score). As most of the problems were related to state departments, necessary policy measures may be taken by the government to address the farm women's problems and issues.

Table 2.1.2 **Problems in performing agricultural activities perceived by farmwomen (n=120)**

S. No.	Perceived Problems	Total Weighted Score on the Severity	% of the Total Weighted Score (out of 600)	Rank
1	Availability of space	448	74.67	V
2	Availability of inputs	401	66.83	IX
3	Lack of irrigation facility	399	66.50	X
4	Involvement in decision making	364	60.67	XIV
5	Lack of self confidence	333	55.50	XV
6	Poor farmers-extension officers linkage	421	70.17	VII
7	Access and control over income	373	62.17	XII
8	Lack of educational qualification	379	63.17	XI
9	Lack of proper technical knowledge & skills	365	60.83	XIII
10	Lack of women friendly tools and equipments	472	78.67	II
11	Laborious and tiring	479	79.83	I
12	Post harvest management	416	69.33	VIII
13	Local market for produce	449	74.83	IV
14	Access to credit	468	78.00	III
15	Lack of storage facilities	438	73.00	VI
16	Lack of training	292	48.67	XVI

2.1.3 Developing gender sensitive model for doubling farmers' income by addressing gender concerns and technological gaps

J. Charles Jeeva, S.K. Srivastava, Anil Kumar, Sabita Mishra, A.K. Panda, Jyoti Nayak, Tanuja S., Ankita Sahu

The project was taken up with the objectives of profiling of income generating activities of farm families and identifying points of interventions; conducting micro level studies to identify gender concerns and technological gaps in doubling farm income; implementing technological modules for enhancing productivity and doubling income with emphasis on integrating gender roles and to study the impact of the interventions and develop a gender-sensitive model for doubling farmers' income.

Team of experts analyzed the technological and developmental gaps and designed logical technological modules. Demonstrated the need based modules through training, demonstrations, capacity building programmes, input support and advisory services, promoting high yielding varieties and hybrids through 16 programmes covering 125 farm families. The gender-sensitive model for doubling farmers' income was evolved as shown below.

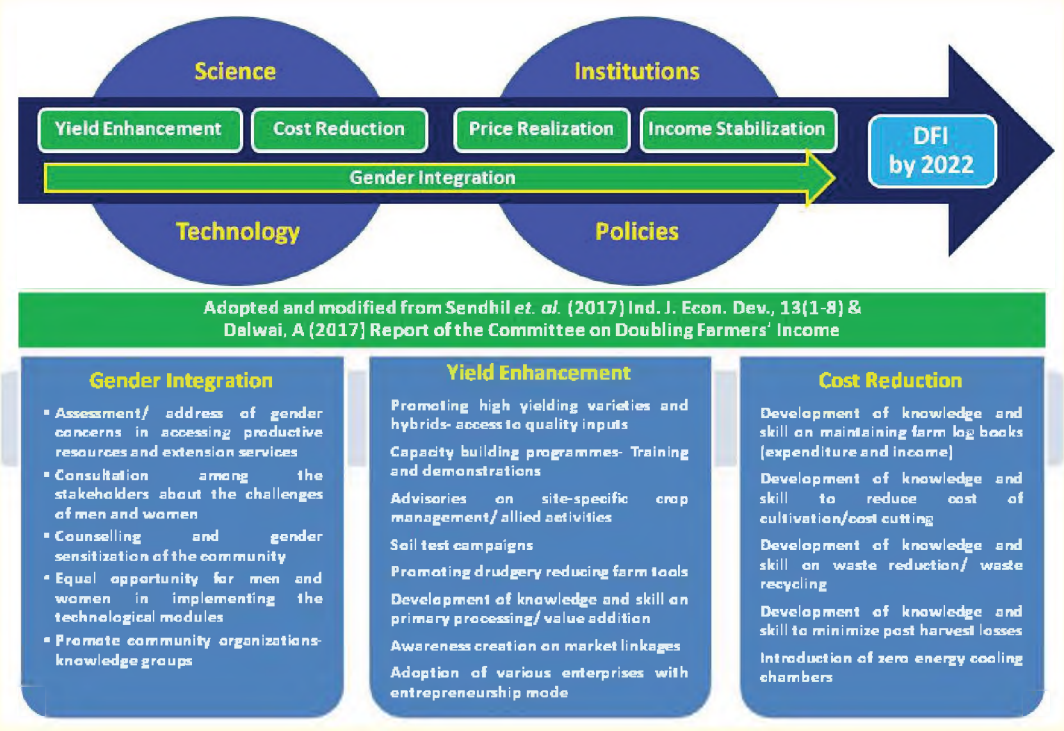

Fig 2.1.1 Gender-sensitive model for doubling farmers' income

Interface with farmwomen at village Nuasahi in Puri district

Interfaces and capacity building programmes were conducted to equip the farm women with improved poultry rearing practices, and concept of taking up backyard poultry in entrepreneurship mode. Technical talks on reducing occupational health hazards and improved health and nutrition of farmwomen and children were also delivered for the benefit of farm women. Inputs for livelihood enhancement like hybrid vegetable seeds, poultry chicks, feed, medicines for disease management and other infrastructural materials for poultry housing etc were also distributed to the farmwomen during these programmes.

Capacity building programme on improved methods of backyard poultry rearing

The outputs realized and the income enhancement due to the technological interventions are given in the following table.

Table 2.1.3 **Income enhancement through technological interventions**

Technological Interventions	Yield/ Income	
	Before the technological interventions	After the technological interventions
Varietal replacement in paddy (Submergence tolerant varieties: Swarna Sub-1; CR-1009 Sub-1)	37.5q/ha (Rs.41,250)	55q/ha (Rs.60,500)
Cauliflower- varietal replacement and improved methods (Var: NS60N (F1 Hyb); Yield; 125q/ha; Invt: 25,000/-)	Rs. 1,00,000 /ha	Rs. 1,87,000/ha
Improved methods of vegetable cultivation (Var: Arka; Yield; 175q/ha; Investment: 25,000/-)	Rs. 1,12,500/ ha	Rs. 1,75,000/ha
Plantations- Banana, Papaya (Var: Bantala, Grand Naine & Red Lady; Investment: 4,000/-)	Nil	Rs. 15,000 (backyard)
Backyard poultry (Breed: Vanaraja)	Rs. 3000/yr	Rs. 6000/ yr
Drudgery reduction- minor farm tools	-	Increased work efficiency
Nutrition- Green leafy vegetables	-	Family nutrition
Mobilization of community for building compost pits	-	Waste recycling

It could be inferred that the technological interventions could result in the enhancement of annual farm income from Rs. 89,300/- to Rs. 1,51,200/- (69% enhancement), and cash in hand among farm women (mean annual savings) from Rs. 18,000/- to Rs. 42,000/- (133% enhancement) for a farm family with 1 acre of land holding with all the resources of agriculture and allied sectors as mentioned above.

2.1.4 Strengthening gender knowledge system in agriculture

Ananta Sarkar, J. Charles Jeeva, Jyoti Nayak, Sabita Mishra

The gender knowledge system (GKS) in agriculture portal (http://www.icar-ciwa.org.in/gks) was updated by including recent publications, information and statistics on women in agriculture. Attempt was made to synchronize the GKS database on publications and technologies for women in agriculture with the Krishi portal of ICAR. The GKS technology format was shared with Krishi team for incorporation of gender component into the technology database of ICAR to ease the process of data collection and compilation. A separate online technology database was also created for better classification and visualization of technologies for women in agriculture. Online data entry and database platform was created for uploading publication of AICRP (Home Science) on Krishi portal where all scientists of AICRP(HS) can register and upload publications. A demo was organized on how to create profile and uploading information and data. A total of 471 publications of the Institute and AICRP(HS) were uploaded on the portal. Databases on programmes and schemes for women in agriculture were prepared. For better management of AICRP(HS) Scientists data, the present employee profile entry form was modified and a new profile entry form was created.

Database of Women Friendly Technologies

Broad Area wise Search

-- Select Broad Area -- SEARCH

Activity wise Search

Select Activity

- Land Preparation
- Nursery Raising
- Intercultural Operation
- Production
- Protection
- Harvesting
- Post Harvest
- Value Addition/ Product Development

SEARCH

Search Term : Activity Value : Value Addition/ Product Development Results Matched : 46

List of Women Friendly Technologies	
1	Amla green leafy balls
2	Bead Stringer
3	Development of Iron rich products to combat micronutrient deficiency
4	Development of Supplementary foods for vulnerable group
5	Eco-friendly antimicrobial treatment for cotton fabrics
6	Extraction and softening of Mesta fibre
7	Fetching trolley
8	Fiber Kelu (roof tile)
9	Functional clothing for harvesting, threshing and winnowing agriculture activities
10	Hypoglycemic preparations for diabetics
11	Iron and SS-carotene rich products to combat aneamia
12	Iron rich health foods (Lehyam, Amla balls and Tamarind balls)
13	Iron rich supplement (Lehyam)
14	Natural dyeing of cotton, silk and wool yarns
15	Natural printing of cotton and silk fabrics

Fig 2.1.2 Technology database

A web based dynamic database was developed for generating data tables related to state wise gender work participation in agriculture. Gender wise percentage values were computed to obtain distribution of agriculture work force among total work force as well as distribution of cultivators and agricultural labourers among the total agriculture work force. The database is menu driven. State wise and combined gender disaggregated tables can easily be generated online from the database. Further, in line with the sex ratio in the country, different state wise ratio statistics viz. number of agricultural labourers per thousand cultivators, number of women agricultural labourers per thousand men agricultural labourers, number of women cultivators per thousand men cultivators, women populations involved in agriculture per thousand men population involved in agriculture, number of women agricultural labourers and cultivators per thousand hectare of cultivated land in the country, nutritional and health status of women over years and the change in the trend were computed using secondary data. The gender ratio of enrolment of male and female students in the country for UG, PG and PhD level was studied. All these statistics are being compiled and documented in the gender mainstreaming document.

Distribution of Cultivators per 1000ha cultivated land in in different states of India (Rural & Urban)

Slno	State	2011			2001		
		Cultivators in 1000ha Cultivated Land	Male Cultivators in 1000ha Cultivated Land	Female Cultivators in 1000ha Cultivated Land	Cultivators in 1000ha Cultivated Land	Male Cultivators in 1000ha Cultivated Land	Female Cultivators in 1000ha Cultivated Land
1	ANDAMAN & NICOBAR ISLANDS	955	730	225	1514	1054	460
2	ANDHRA PRADESH	484	325	159	598	395	202
3	ARUNACHAL PRADESH	1199	605	593	1189	580	608
4	ASSAM	1406	1073	333	1296	915	381
5	BIHAR	1165	930	235	1316	1037	279
6	CHANDIGARH	1955	1603	352	1451	1143	308
7	CHHATTISGARH	809	490	319	858	491	367
8	DADRA & NAGAR HAVELI	1414	919	496	1678	768	910
9	DAMAN & DIU	708	456	252	1694	843	851
10	GOA	218	131	87	356	182	175
11	GUJARAT	510	397	113	557	375	182

Distribution of Gender ratio (Number of Female per 1000 Male) in Agriculture in different states of India (Rural & Urban)

Slno	State	2011			2001		
		Female Cultivators per 1000 Male Cultivators	Female Agricultural Labourers per 1000 Male Agricultural Labourers	Female (Cultivators + Agricultural Labourers) per 1000 Male (Cultivators + Agricultural Labourers)	Female Cultivators per 1000 Male Cultivators	Female Agricultural Labourers per 1000 Male Agricultural Labourers	Female (Cultivators + Agricultural Labourers) per 1000 Male (Cultivators + Agricultural Labourers)
1	ANDAMAN & NICOBAR ISLANDS	308	277	301	437	279	403
2	ANDHRA PRADESH	490	1087	879	511	1143	861
3	ARUNACHAL PRADESH	980	968	979	1049	824	1033
4	ASSAM	310	634	397	416	518	441
5	BIHAR	253	459	395	269	537	423
6	CHANDIGARH	219	227	222	269	221	259
7	CHHATTISGARH	652	1172	908	748	1448	985
8	DADRA & NAGAR HAVELI	539	2264	935	1184	1710	1306
9	DAMAN & DIU	552	1133	666	1009	2813	1275

Fig 2.1.3 Output on state wise ratio statistics from dynamic database

2.1.5 Exploratory study on nutritional status of Nabarangpur district of Odisha

S. K. Srivastava, Ananta Sarkar, Gayatri Moharana

After the assessment of the 20 identified farm families in Semla village of Umarkote Block, various interventions were made to bring desired change in their nutrition, livelihood and health aspects. It was observed that the farm families in Semla were involved more (85%) in cultivation of maize in contractual basis which was the major source of income for the farm families. Women involved in dehusking and deshelling of maize responded to the queries on drudgery and accepted that shelling of maize kernels was a tedious task. Therefore, tubular maize shellers were distributed among 20 farmwomen involved in post harvest operation of maize. Utilization of tubular maize shellers saved their time as well as drudgery from traditional system of manual maize dehusking and deshelling.

The baseline survey revealed that there was not adequate consumption of protein in their diet as they were traditionally more dependent on ragi and rice to fill their appetites. To enhance the protein consumption of the selected farm families high yielding variety of black gram (var. PU 31) was introduced in the village Semla for cultivation in rabi season to capitalize on the residue moisture available after paddy cultivation as paira cropping. To improve women's health condition involved in household chores, terafil water filter (for clean drinking water) and smokeless chulhas (to reduce drudgery and health risks involved due to continuous exposure and inhalation of smoke from traditional chulhas) were also distributed to the identified farm families in Semala.

Women farmers with terafill water filter and smokeless chulha in Semla village.

All the interventions were highly adopted by the farm families. It was observed that the percentage change in CED status based on BMI was minimised in Semela village, Umarkote block where intervened as compared to other three blocks of Nawarangpur district where intervention was delayed.

Table 2.1.4 **Change in CED status due to intervention**

Difference Percentage	Chandahandi		Tentulikhunti		Nawarangpur		Semela	
	Women	Men	Women	Men	Women	Men	Women	Men
Mild to Moderate (< 18.5)	-2.05	-0.9	-1.76	-1.3	-1.13	-1.36	-4.52	-6.58
Normal (18.5-24.9)	1.61	0.77	1.64	0.91	0.59	1.05	3.82	5.31
Overweight (> 25)	0.45	0.22	0.22	0.38	0.54	0.31	0.71	1.27

2.1.6 Optimizing technological interventions with gender perspective in small scale mango orchards

Ankita Sahu, S. K. Srivastava, J. Charles Jeeva, Chaitrali S. Mhatre

Considering efficient spatial and temporal utilization of interspaces in mango orchards, suitable intercrops were raised in the mango orchards of Harekrushnapur and Baskitala villages of Mayurbhanj district of Odisha in a participatory action mode to cater to the financial and nutritional requirements of 55 farm families. Intercropping provides a suitable alternative to derive livelihood from orchards during initial lean period. It also helps in preventing soil erosion, suppresses weed growth, provides additional source of income and sustain food & nutritional security of farm families. The sustainability of these intercropping models was determined through Sustainable Livelihood Index (SLI). The SLI was calculated considering seven aspects *viz.*, Environmental Conservation (EC), Permanent Asset Creation (PAC), Food Security (FS), Nutritional Security

(NS), Input Recycling (IR), Employment Generation (EG) and Annual Income Generation (AIG) from different intercrop combinations. Among the various intercrops, pineapple scored the highest SLI (86.60), while tomato attained moderately high (74.81) SLI. Intercrops *viz.,* brinjal, okra, cucurbits and cole crops scored moderate SLI, while Chilli, Onion, Dolichos bean, Garden pea, Radish, Amaranthus, Spinach and Yam had low SLI scores. Pineapple proved to be the best intercrop in terms of environmental conservation, input recycling, employment generation and income enhancement. The mango orchards can be successfully intercropped with pineapple for sustaining the livelihood opportunities of women farmers of the region.

Table 2.1.5 **Sustainable Livelihood Index scores of various intercrops in mango orchard**

Crops	EC	PAC	FS	NS	IR	EG	AIG	SLI Scores
Pineapple	97.58	91.51	53.94	85.46	92.73	88.48	92.73	86.06
Brinjal	52.70	61.21	76.40	88.50	52.70	83.60	66.10	68.74
Tomato	70.30	79.40	86.10	84.20	47.90	66.10	89.70	74.81
Chilli	67.90	63.63	41.20	46.70	42.40	45.50	69.70	53.86
Onion	55.20	51.51	81.80	77.60	35.80	41.20	55.76	56.98
Okra	75.80	70.90	77.60	73.90	49.70	64.80	80.60	70.47
Dolichos bean	66.70	44.80	76.40	70.90	77.60	46.10	58.80	63.04
Garden pea	63.00	61.81	45.50	72.70	42.40	70.30	63.63	59.91
Radish	61.20	38.20	44.80	50.90	41.80	50.90	46.70	47.79
Amaranthus	66.10	46.10	84.80	94.50	41.20	40.60	50.30	60.51
Spinach	65.50	47.90	80.60	92.70	40.00	39.40	49.10	59.31
Yam	58.80	36.40	72.70	66.70	83.00	37.00	41.80	56.63
Cucurbits	74.50	68.48	86.10	86.70	40.60	76.40	69.10	71.70
Cole crops	49.70	82.40	50.90	61.80	50.90	87.90	90.30	67.70
Mean	**66.07**	**60.30**	**68.49**	**75.23**	**52.77**	**59.88**	**66.02**	**64.11**
SD	**11.44**	**16.37**	**16.46**	**14.30**	**17.39**	**18.42**	**16.38**	**9.49**

A training cum demonstration programme on planting material production of fruit crops for the tribal farm women of Baskitala Dasheri Mango Producer Group, Bangriposi block, Mayurbhanj district of Odisha was organized on 30 July, 2019. The farm families were sensitized about community nursery raising as an alternate source of livelihood. Hands on training were imparted on planting material production of some horticultural crops *viz.,* mango, papaya, cashew nut and pineapple. The techniques of raising a healthy rootstock, forcing treatment of scion and grafting techniques were also imparted to the farming community. In order to popularize some exotic fruit crops in mango orchard, planting materials of dragon fruit were distributed among the farm families. During the programme, women friendly small tools *viz.,* khurpi, trowel, hand weeder, secateurs, grafting and budding knife, hand sprayer, rose can and accessories like hand gloves and face mask were provided to farm women to ease the farming operations. Need based pesticides and fungicide for pest and disease management of the mango orchards and rainy season vegetables for intercropping in the mango orchards were distributed to fifty women farmers. The demonstration was attended by 57 tribal farmers and farm women of the region.

Planting material production of fruit crops by tribal farmwomen

Distribution of planting materials of Dragon fruit to tribal farm families

2.1.7 Mapping livestock and gender and studying the role of institutions in livestock development in Eastern India

Anil Kumar, B. Sahoo, Tanuja S.

The impact of establishment of milk producers' cooperative, Khalagaon MPCS was analyzed and mapped to understand gender and role of institutions in livestock development in Eastern India. The Khalagaon MPCS was established in the year 1985 under the aegis of Cuttack Milk Union (CMU) which is operating since 1976 in four districts namely, Cuttack, Jagatsinghpur, Kendrapara and Jajpur.

Khalagaon is located within 20 km from the seashore where agriculture is primary occupation. Of the total geographical area of 248 ha of the village, the net sown area is 220.6 ha but only 18.8 percent of the cultivated area is irrigated. Public institutions are far off from the village with nearest veterinary hospital being more than 10 km away and no presence of commercial or co-operative bank, agricultural credit/ marketing society, weekly haat or regular market. Under such a scenario, dairying has emerged as an important vocation providing regular employment and income to the people. The culture of keeping dairy animals was non-existent in the region until two and half decade ago. After the opening of the MPCS in 1985 in the village and the enterprising attitude of a few eager persons, there has been a real turnaround in the dairy sector in the village.

The Khalagaon MPCS has a total of 161 members of which only 10 are female. Although the institutional membership by women was only 6 percent, they were involved in most of the activities related to management of dairy animals and bringing the milk to the collection centre. The Khalagaon MPCS serves the farmers of four nearby villages namely, Apandra, Khalagaon, Belapur and Sribantpur. The active members actually delivering milk to the society per month was 103, with an average daily milk collection of 649.4 ± 128.2 litres. The society generated revenue of Rs.62.76 lakh for its members by collecting 2.37 lakh litres of milk during 2018-19. On an average, the members earned Rs.5082 per month. The average milk price was Rs.26.48 per litre.

Table 2.1.6 **Pattern of milk collection and revenue generated by Khalagaon MPCS during 2018-19**

Month	Monthly milk collection (lit)	Monthly revenue (Rs.)	Milk price (Rs./lit)	Number of active members	Average daily collection (lit)	Monthly revenue per member (Rs.)
Apr-18	20711	540654	26.11	110	690	4915
May-18	26313	590672	22.45	109	849	5419
Jun-18	21019	551367	26.23	110	701	5012
Jul-18	24346	633736	26.03	117	785	5417
Aug-18	22378	602406	26.92	111	722	5427
Sep-18	20169	556504	27.59	106	672	5250
Oct-18	21058	578084	27.45	101	679	5724
Nov-18	19156	545673	28.49	100	639	5457
Dec-18	18119	503798	27.81	94	584	5360
Jan-19	11086	305759	27.58	89	358	3435
Feb-19	14354	384077	26.76	91	513	4221
Mar-19	18322	483132	26.37	97	591	4981
2018-19	237030	6275862	26.48	102.9	649	5082

Fifteen percent (14.9 percent) of the members remained active throughout the year bringing milk to the society, 55.9 percent between 6 to 12 months, 16.1 percent between 3 to 6 months and 13 percent members less than 3 months. The average quantity of milk brought to the society by the members was 6.3 ± 6.1 litre per day. Ten percent of the members deposited more than 10 litre of milk per day, 31.1 percent members between 5 to 10 litre, 46.6 percent between 2 to 5 litre and 12.4 percent less than 2 litre. The members on an average earned Rs.5082 per month. Five percent of the members earned more than Rs.1000 per month, 18.6 percent between Rs.5000 to 10000, 37.9 percent between Rs.3000 to 5000, 18.0 percent between Rs.2000 to 3000 and 20.5 percent less than Rs.2000 per month. The average price of milk realized by the farmers was Rs. 26.5 ± 3.1 with highest being Rs.35 and the lowest Rs.16 per litre. Average price per litre was more than Rs.30 for 11.2 percent of the farmers, 62 percent farmers got between Rs.25 to 30, 23.6 percent between Rs.20 to 25 and only 3.1 percent less than Rs.20.

2.1.8 Livelihood of rural women in different agro-climatic regions with different levels of participation in agriculture and allied sectors

Anil Kumar, J. Charles Jeeva, Ananta Sarkar

There are a number of agencies collecting data on women in agriculture which include the census exercise and the NSSO survey among others. Very often, data on workers are quoted without giving the reference to the agency collecting it. Therefore, the different figures cited at different places create confusion in the minds of readers as to which one is correct.

The spatial character of distribution of women's participation in agriculture has not been widely studied. With respect to workers in agriculture and women in agriculture in particular, it is important to know how many of them are engaged in this vocation, their status as principal or main worker/ subsidiary or marginal worker, how many of them are engaged as cultivators or agricultural labourers, number of households engaged in agriculture and the population dependent on it.

The practice of agriculture depends on a number of factors which in turn determines the participation of women in agriculture. Planning Commission (Khanna, 1989) had identified fifteen resource development regions in the country with fourteen regions in the mainland and the one island region with the objective to integrate plans of the agro-climatic regions with the state and national plans to enable policy development based on techno-agro-climatic considerations (Planning Commission, 2011). These 15 agro-climatic regions (ACR) formed the basis for the district wise analysis to study the status of women in agriculture for the 640 districts using indicators of genderscape and work participation. Female agriculture work participation (as percent of population) was calculated for all the 640 districts.

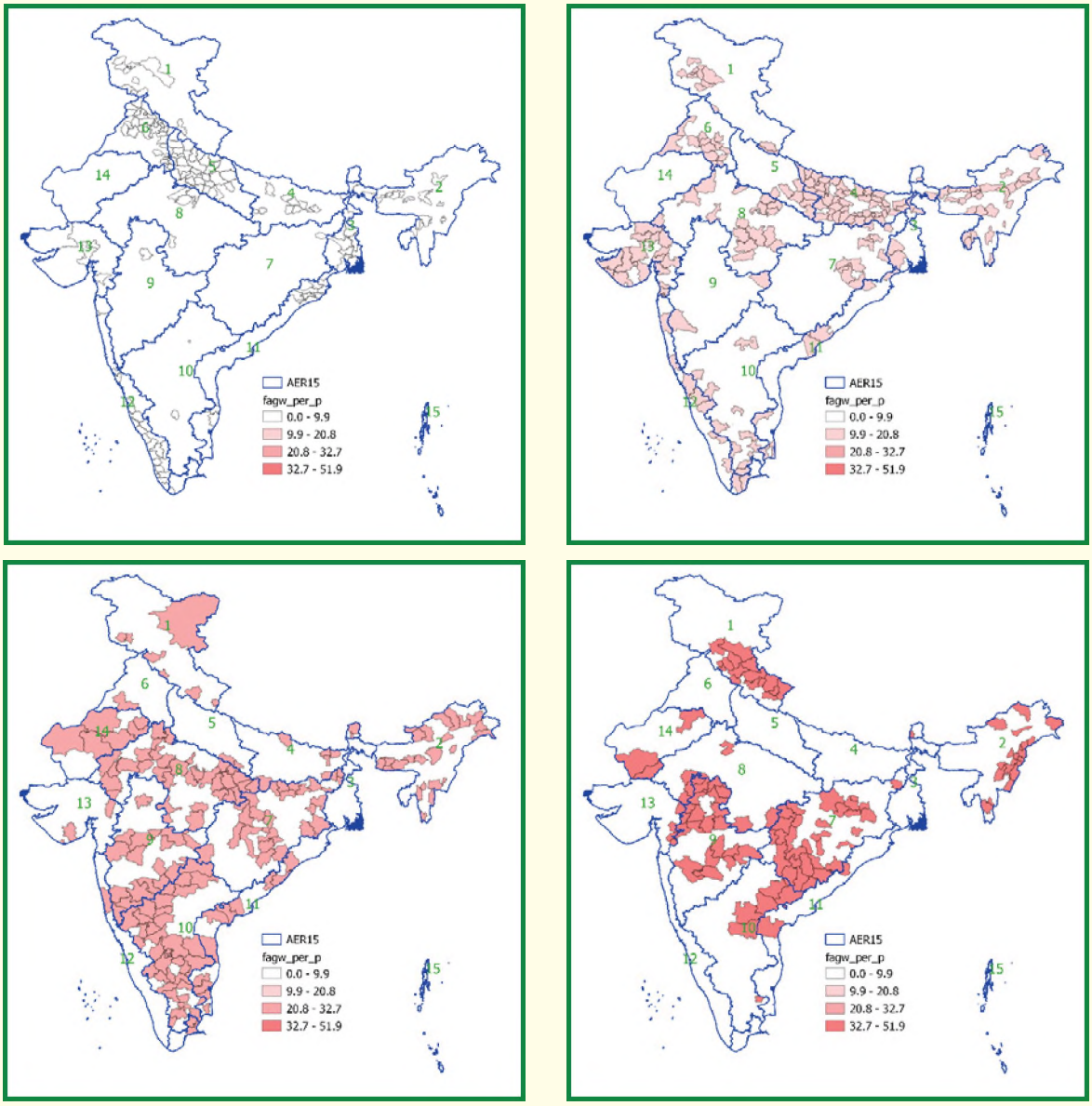

Fig 2.1.4 Distribution of female agricultural workers (percent of population) in the 15 agro-climatic regions of India (fagw_per_p: female agriculture work participation)

Thematic maps were generated using open source GIS software QGIS3.10 by classifying the data into four classes using 'Jenks natural break' which minimizes the within group variance and maximizes between groups in one dimensional data. Thus, four categories of female agriculture work participation were identified (in percent) viz., very low (<9.9), low (9.9 - 20.8), medium (20.8 - 32.7) and high (32.7 - 51.9). Thematic map for female agriculture work participation was overlaid with 15 agro-climatic regions for analysing the spatial distribution of female agricultural workers across different ACR. The average female agricultural work participation (in percent) under class very low was 4.75 followed by 14.9 in low, 26.5 in medium and 37.5 in high. The number of districts under the four classes very low, low, medium and high were respectively, 174, 182, 175 and 109. Correlation analysis revealed that the female agricultural work participation (percent of population) was significantly correlated ($p<0.05$) with gender gap in literacy, ST population and indicators of child nutrition (stunting, wasting and underweight) and negatively correlated ($p<0.05$) with female literacy and human density.

Table 2.1.7 **Correlation matrix with level of significance (p<0.05) among various indicators**

S. No.	Indicators	1	2	3	4	5	6	7
1	Female ag worker (percent of population)	1						
2	Human density	-0.3008*	1					
3	Literacy female (%)	-0.3663*	0.2238*	1				
4	Gender gap in literacy (%)	0.3471*	-0.2112*	-0.7711*	1			
5	Scheduled Tribe (%)	0.4949*	-0.1521*	-0.0747	-0.1550*	1		
6	Stunting (%)	0.1496*	-0.0749	-0.5841*	0.4635*	0.0156	1	
7	Wasting (%)	0.2866*	-0.0471	-0.2528*	0.2952*	0.0125	0.2741*	1
8	Underweight (%)	0.2230*	-0.0746	-0.5386*	0.4980*	-0.0719	0.7883*	0.7054*

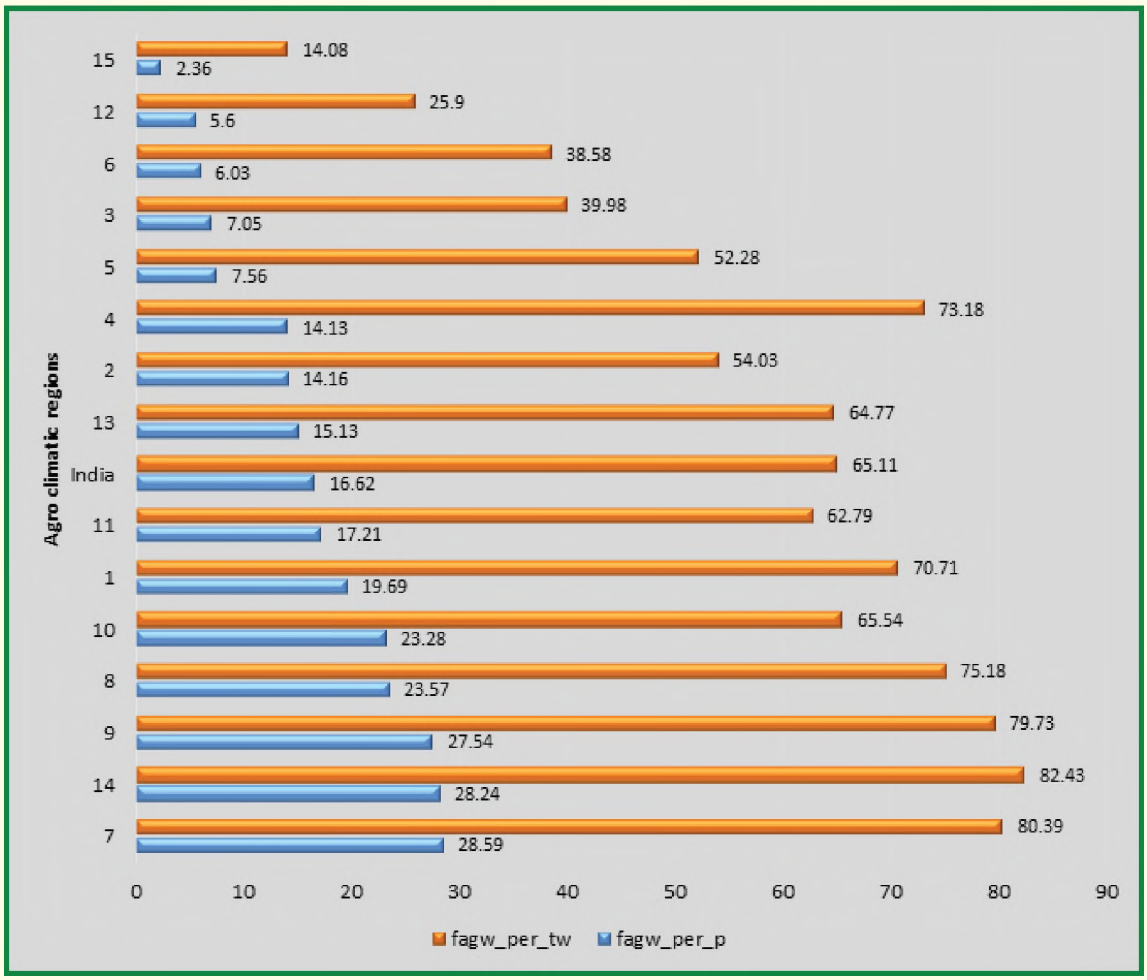

Fig 2.1.5 Participation of female (as percent of population, fagw_per_p and percent of total workers, fagw_per_tw) in agriculture in the 15 agro-climatic regions

The distribution of female agricultural workers across the 15 ACR are presented as percent of population or as percent of total workers. It may be noted that the female agricultural workers as percent of total workers does not always give a realistic picture of participation of female in agriculture because of the varying number of total female workers. Five ACRs (3, 5, 6, 12 and 15) had less than 10 percent of female working in agriculture. The five ACRs with high participation of female agricultural workers as percent of population were 7, 8, 9, 10 and 14.

2.1.9 Status of women in peri-urban dairy farming: mainstreaming their role for enhancing income and productivity

B. Sahoo, Anil Kumar, A. K. Panda, Lipi Das

Peri urban dairy farming is being practised in coastal belt of Odisha as the domain of farm women. The study was conducted to assess the effect of critical supplementation of mineral mixture, a rare practice in conventional dairy farming practiced by farm women in lactating crossbred cows especially on productive and reproductive performance. Fifty farm women each in 3 districts (Cuttack, Jagatsinghpur and Puri) were selected and training was imparted on complete package of practices in dairy farming.

Field study (180 days of lactation) conducted in village Khalagaon, Jagatsinghpur on mineral mixture supplementation in conventional feeding on 40 crossbred milch cows having 20 each in 2 groups revealed that animals in treated group additionally supplemented with mineral mixture @ 70g/cow/day with concentrate mixture improved (P≤0.05) daily milk yield by 14.5 percent. However, milk composition was not influenced by supplemental mineral mixture. Mineral mixture fed group showed enhanced reproductive efficiency in which days of first post - partum estrus and conception rate were found significantly (P≤0.05) shorter and higher, respectively than control. The net return over feed cost and feed efficiency was improved by 21 and 12 percent in mineral supplemented group, respectively.

Skill based training on Improved dairy farming

Training on balanced ration preparation

Another field study conducted at farmers' field in Jagannath Vihar, Bhubaneswar, Khurda on 20 milch crossbred cows divided into 2 groups of 10 each showed that additional supplementation of mineral mixture @ 2 percent in concentrate mixture resulted higher (P<0.05) milk yield, fat corrected milk yield and milk composition than control. The economics of feeding supplemental mineral mixture revealed that net return over feed cost was 23 percent more than control. Feed efficiency was improved by 11 percent in mineral supplemented animals indicating beneficial effect of mineral mixture a pathway for economic empowerment. Other than supplementation of mineral mixture and oil cakes, better housing and taking hygiene and sanitary measures in lactating cows, health care through vaccination, vermi composting along with perennial fodder cultivation were popularized. Fifty five percent of farm women adopted these techniques. Three women dairy scouts one in each district was selected and trained to popularize the dairy technologies to farm women.

2.1.10 Gender inclusive homestead aquaculture for enhancing household fish consumption and Income

Tanuja S., Ananta Sarkar, Gayatri Moharana, Chaitrali S. Mhatre

The project was taken up with the objectives to study the gender roles in homestead aquaculture and post harvest processing and to identify the gaps in technology adoption and productivity, to demonstrate scientific homestead aquaculture and processing technologies by integrating gender responsive methodologies and to study the effect of introduction of small indigenous fishes along with Indian major carps on homestead aquaculture production, household fish consumption and income flow.

The gender roles in the homestead aquaculture was analysed from the data obtained in Focus Group Discussions and interviews using the developed semi

structured questionnaires. Men had 100 percent participation in purchase of inputs, applications of pesticide and insecticides, sampling of fish, harvesting of fish and marketing of fish. Processing and value addition was exclusively done by women. Activities like pond preparation, weeding, stocking of fry, watch and ward and record keeping was done jointly. Women's access to resources, their decision making ability, participation and their perception towards the technology of polyculture of small indigenous fishes with Indian Major Carps (IMC) have been studied. Social acceptance, support from counterpart/family members, technological knowhow on polyculture of small indigenous fishes with IMC, timely availability of quality seed and availability of credit were perceived as most important by all the women farmers. Property rights, freedom to use the ponds for aquaculture, marketing of fish and freedom of mobility were perceived as least important for them to participate in homestead aquaculture.

Dietary diversity and the food consumption score was estimated prior to the intervention. The food consumption score was 59 which are considered as acceptable food security level by the World Food Programme. The average per capita monthly consumption of different food items was estimated.

Table 2.1.8 **Average per capita monthly consumption of food items**

S.No	Food item	Average per capita monthly consumption (kg)
1	Rice	9.19
2	Wheat	0.88
3	Tubers	0.18
4	Pulses	2.00
5	Milk	0.31
6	Fruits	0.23
7	Fish (IMC)	1.94
8	Fish (SIFFS)	0.17
9	Potato	6.90

The homestead ponds were scientifically managed following water quality management and supplementary feeding. Trainings on water quality testing and trellis system development for growing vegetables on the pond bunds were imparted to the beneficiaries with homestead ponds. In the first season, an average production of 298.2kg of IMC was obtained from 0.17Ha water area with an average weight at harvest of 742gm. A net profit of Rs.20560.0 was realized during the season. Prior to project intervention, production was around 80kg-130kg/0.17 ha. On an average, 174kg vegetables were harvested from the trellis system around ponds and pond bunds with a monthly income of Rs. 6419/- (pond area ranging from 0.08-0.22Ha). Regular biweekly harvesting of SIFFS is being carried out in the villages using the 12mm mesh size gill net with a yield ranging from 200-750gm. The harvested SIFFS are entirely used for household consumption. Trials with indigenous box type fish traps for harvesting of SIFFS from ponds and canals were carried out. On an average, 1.5kg of SIFFS were harvested using box trap within a period of one hour.

2.1.11 Promoting gender equity through family poultry production

A. K. Panda, B. Sahoo

Family poultry production has been recognized globally to alleviate poverty, hunger and malnutrition in developing countries. It offers advantages over other agricultural sectors and is an entry point for promoting gender balance in rural areas. *Vanaraja*, a dual purpose bird developed by ICAR-Directorate of Poultry Research, Hyderabad, India is gaining popularity across India for family poultry farming. The present study was conducted to study the effect of supplementary feeding on production performance of *Vanaraja* laying hens and income of farm women reared under extensive system of production. A total of 300, four weeks old *Vanaraja* chicks were distributed to 20 selected farm women (15 female chicks) in Chanrapada and Denua basta, Nimapada block of Puri district, Odisha, India. The farm women reared the chicks by allowing them scavenge outside during day time and during night they were provided night shelter (low cost house), constructed using locally available bamboo and paddy straw with provision of drinking water. At 16 weeks of age, supplementary feeding @ 35g/bird/day was given to one group (birds reared by 10 farm women). Egg production was recorded daily. Egg weight was taken at 32 and 40 weeks of age. Supplementary feeding @ 35g/bird/day during 16-40 weeks of age resulted in significantly higher egg production compared to those of without supplementation. The birds of supplementary fed group produced more eggs with higher egg weight compared to non supplementary one. Calculating the feed cost at Rs.20/kg, the net return was higher by Rs.1790 per beneficiary due to supplementary feeding (around Rs.128/bird). From the results of the present study, it is concluded that supplementary feeding @ 35g/bird/day to *Vanaraja* laying hens in extensive system of production resulted in higher egg production and economic return.

Daily egg collection by farm women

Vanaraja bird in backyard

Family poultry is the small-scale poultry keeping by households and supplementary feed using locally available feed resources. The poultry may range freely in the household compound and find much of their own food, getting supplementary amounts from the householder. To address the livelihood and nutrition of farm family, a poultry production model was developed which is given hereunder.

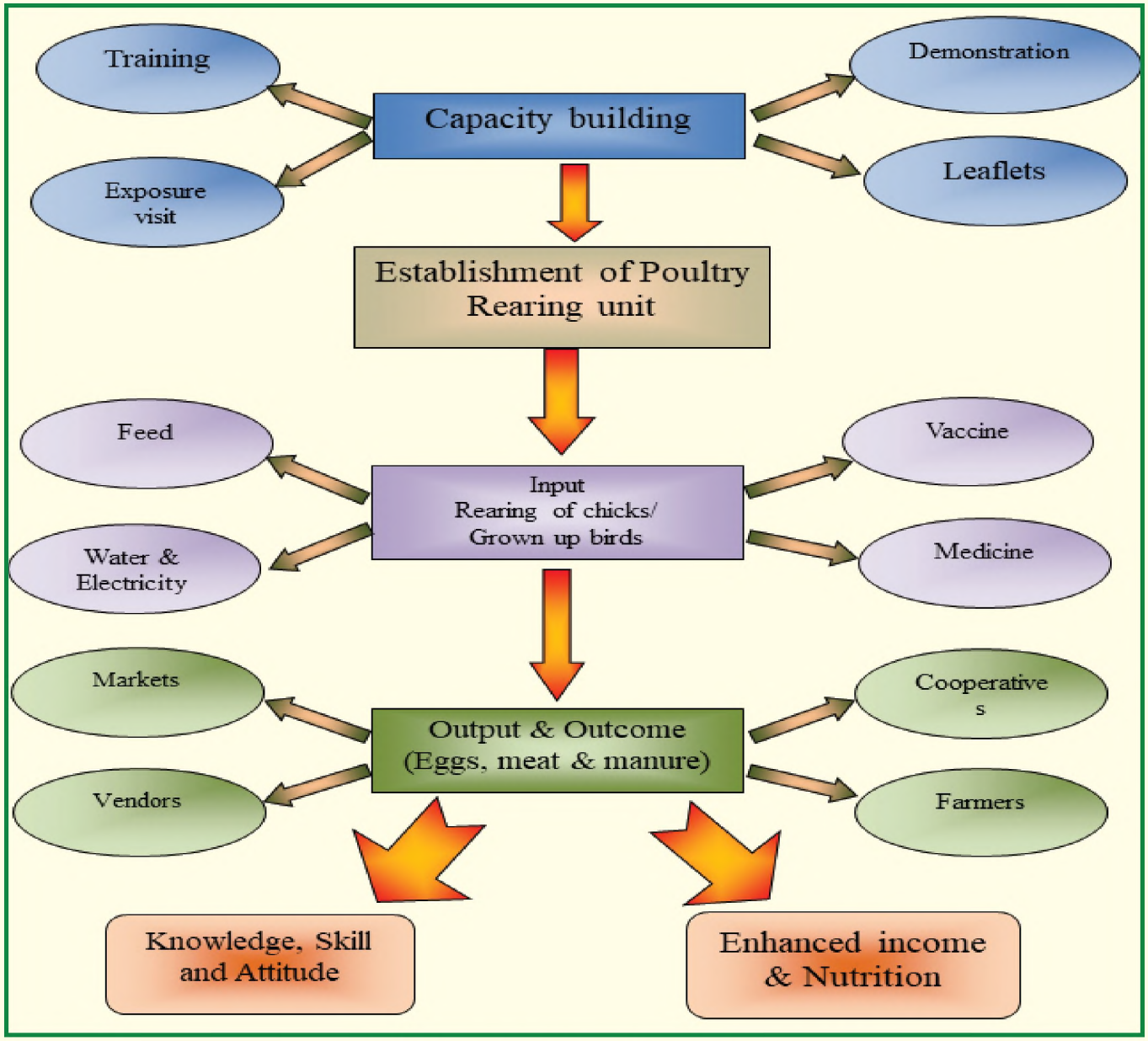

Fig 2.1.6 Family Poultry Production Model

2.1.12 Enhancing income of rural women through improved goat rearing

B. Sahoo, Anil Kumar, A. K. Panda, Sabita Mishra, Jyoti Nayak

Women play a major role in goat farming mostly based on zero input especially by the tribal communities in Odisha. The productivity of goats under prevailing traditional system is very low as goats are maintained under extensive system on natural vegetation with low plane of nutrition. Farm women rarely practice scientific feeding, breeding and management practices which affect their productivity and economic return. Development of awareness and skill based capacity building of farm women improve their self-confidence and decision making in income generation activities through entrepreneurship mode, which was attempted in the present study.

Training and animal health camp

The present study was conducted in two blocks namely Jagannath Prasad and Banapur consisting of 5 cluster of villages in Ganjam and Khurda district of Odisha. About 200 farm women were selected to undergo skill development training for goat microenterprises on scientific feeding, breeding, housing and management practices of goats. Identification of constraints revealed that marketing (65%) of goats at suitable period followed by access to resources (55%) and technologies (35%) were found to be the major constraints faced by the farm women. Skill based capacity building improved their management skills leading to better adoption of the scientific practices.

- Supplementation of mineral mixture during peak phase of growing goats (6m-1 year) and last 2 months of pregnant does, and overall adoption level of technologies revealed medium level (62%) of adoption by the respondents.
- Proper feeding and management of goat and timely vaccination enabled the farm women to reduce mortality of kids from 20 percent to 5 percent. Housing with raised bed wooden floor with ventilation coupled with proper health care and vaccination saved 30 percent loss which in turn enhanced the income of farm women.
- Improved goat farming technologies increased growth rate by 17 percent and reduced the mortality of kids by 20 percent besides motivating about 30 percent farm women to start goat farming in entrepreneurship mode.

Another field trial was conducted to assess the effect of mineral mixture on reproductive performance of doe and adaptability by farm women. Two villages from the cluster of villages i.e., Kusapali of Ganjam district and Banapur of Khorda district were selected. Thirty female goats (*Capra hircus*) of 15.7±1.3 kg at 12±0.75 months of age were assigned three dietary treatments in a completely randomized design with 10 goats in each. During a 6 month feeding trial, animals received conventional bran based diet in T_1 (control) devoid of mineral mixture and oil cake. Oil cake (GNC) @ 100g/ day was incorporated in concentrate mixture offered to goats replacing rice bran supplemented in T_2. However, additional mineral mixture (10g/goat/day) was provided to animals in T_3 along with diet offered in T_2. During the trial, only 250g of concentrate mixture consisting of ground nut oil cake, maize and bran was provided.

Data on reproductive performance on goats showed that number of services per pregnancy and post parturient complications were less as compared to control. Supplementation of mineral mixture along with ground nut oil cake in goats has beneficial effect on reducing age at first service, post parturient complications as compared to supplementation of GNC only which revealed synergistic effect of protein and mineral mixture on reproductive performance of goats. It is concluded that the supplementation of mineral mixture along with proteinaceous cake during pregnancy in does improved reproductive performance of goats.

2.1.13 Drudgery reduction of women involved in fish processing through technological interventions

Jyoti Nayak, Tanuja S., Chaitrali S. Mhatre

The project was taken up with the objectives, to document existing technologies related to fish processing developed by ICAR and other national institutions, to identify the gap areas and the reasons for adoption/ non adoption for existing fish processing technologies, to assess the gender based drudgery prone activities and testing the solution through available/ refined technologies in fish processing, to

disseminate improved technology/ package in fish processing and impact evaluation.

Survey was carried out through personal interview to identify the constraints of randomly selected fisher women (forty each) in the adoption of improved technologies in three districts such as Puri, Ernakulam and Raigada of Odisha, Kerala and Maharashtra, respectively. The data were collected personally with the help of well structured interview schedule. Each respondent was asked to indicate her degree of agreement to each constraint in a 3 point scale. Then the constraints were ranked on the basis of the mean score calculated for each constraint. The constraints were classified into six broad groups like production constraints, technological constraints, economic constraints, social constraints, infrastructure constraints and marketing constraints.

Table 2.1.9 **Constraints experienced by the women in the adoption of technology in fish processing**

S. No.	Constraints in Technology	Mean Score	Rank
A.	**Production Constraints**		
1	Unavailability of suitable land	1.75	III
2	Unavailability of fish seed	1.50	IV
3	Lack of water source	2.25	I
4	Scarcity and high cost of labour	1.95	II
B.	**Technical Constraints**		
1	High cost of technology	1.95	I
2	Complexity of new technology	1.35	III
3	Inadequate technical advice	1.60	II
C.	**Economic Constraints**		
1	Credit availability	2.0	IV
2	Lengthy and cumbersome procedure of getting credit	2.5	I
3	High rate of interest	2.05	III
4	Inadequate subsidy provision	1.95	V
5	Lack of investment capacity of farm women	2.1	II
D.	**Social Constraints**		
1.	Lack of social recognition	1.00	IV
2.	Poaching	3.00	I
3.	Lack of family support	1.95	III
4.	Groupism in village	2.55	II
E.	**Infrastructure Constraints**		
1.	Irregular visit of Fishery extension officer	1.85	IV
2.	Lack of storage facilities	2.00	II
3.	Lack of fishery cooperatives	1.95	III
4.	Inadequate information to the beneficiaries	2.02	I
F.	**Marketing Constraints**		
1.	Lack of special market	3.0	I
2.	Lack of transport facilities	2.95	II
3.	Scarcity of ice availability	1.95	IV
4.	Lack of toilet facility	2.80	III

The entire fish processing sector is highly dependent on women as women comprise more than 90 percent of the workforce in shrimp peeling and 70 percent in the processing of other fish products. It was elicited that sorting, cleaning, drying, and marketing were women dominated activities. The subsistence fisherwomen are prone to health hazards due to exposure to extreme temperature, poor ergonomic practices and exposure to pathogens, whitlow etc. To assess the gender based drudgery prone activities and testing the solution through available/ refined technologies in fish processing, the study was conducted in Balidia, Chellanam and Alibag villages of Odisha, Kerala and Maharashtra states respectively. The samples consisted of 120 fisher women engaged exclusively in fish processing from last five years. The samples were purposively drawn and an interview schedule was used for collecting the information from individual fisher woman. Drudgery experienced by women was assessed on a 5 point scale, on six parameters which gave a total score of drudgery out of maximum score of 30. The cumulative drudgery scores for all the above activities were computed. The most drudgery prone activity was marketing followed by cleaning, drying and then sorting.

Table 2.1.10 **Drudgery scores experienced by women in different fish processing activities**

Drudgery Score Parameters (n=120)							
Activities	Rating on work demand	Rating on feeling of exhaustion	Rating on posture assumed in work	Perception on manual loads	Rating on difficulty perception	Rating on work load perception	Total Drudgery score (Max score 30)
Sorting	4.63	4.40	3.83	4.07	4.20	3.73	24.87
Drying	4.63	4.53	3.83	4.07	4.63	4.10	25.79
Cleaning	4.73	4.53	4.63	4.33	4.77	4.63	27.62
Marketing	4.70	4.73	4.45	4.53	4.77	4.83	28.01
Total	18.69	18.19	16.74	17.00	18.37	17.29	106.28
Average	4.67	4.54	4.18	4.25	4.59	4.32	26.57

2.1.14 Livelihood improvement of tribal farm women through secondary agriculture

Gayatri Moharana, Jyoti Nayak, Ankita Sahu, Lipi Das

The study was carried out with the objectives of assessing the gender based technological needs and gaps of tribal women in secondary agriculture and to identify technological interventions for strengthening gender participation in secondary agriculture. Secondary data were collected on availability of surplus agro-produce in tribal areas. Interview schedule was developed for identifying prevailing status of gender issues and technological needs and gaps. For successful implementation of the study, Jagannath Prasad block of Ganjam and R. Udayagiri block of Gajapati district where tribal women play a major role in secondary processing and value addition of millets, vegetables and fruits were selected.

The respondents from Jagannath Prasad block of Ganjam district revealed that they are involved in primary processing of millets i.e. ragi which is also one of the staple food among the tribal families throughout the year. During summer, they harvest mango and cashew nut in a huge quantity and do minimal processing and value addition such as salt drying of mango, deshelling of cashew nut in traditional method and sale in the market which give less remuneration. The scenario was different in R. Udayagiri block of Gajapati district where tribal woman mostly produce and harvest millets, mango, pineapple and banana in the hills. Mostly they do organic practices which attract the customer to pay more. But due to lack of knowledge on post harvest and value addition and lack of communication and transport facilities, they mostly sell the produce in raw or ripened condition. The data revealed that major causes of post-harvest loss of fruits and vegetables were due to lack of storage facility (100%), market problem (88.6), improper harvesting (67%) followed by insects infestation (31.4%) and nature of produce (20%). Data were analyzed to find out demands, needs and gaps for suitable technological interventions. The data on technological needs revealed that 97 percent women expressed for learning new skill/ technologies for value addition where as 95 percent women wanted knowledge and skill on post harvest management and need of women friendly technologies for harvesting/ post harvest operation as intervention was also highly needed by 93 percent tribal women.

During the reporting period, some of the standardized protocols for processing technologies and value addition of horticultural crops were collected from ICAR-CIPHET, Ludhiana and OUAT, Bhubaneswar. Collaboration were made with the Krishi Vigyan Kendras (KVK) of both district where they can give their frequent inputs regarding knowledge and skill on proper technique for harvesting vegetables and fruits and how to improve shelf life of perishable products by applying lime solution, hot water treatment, packaging etc. Established linkage with Community Food & Nutrition Extension Units, Govt of India, Bhubaneswar who imparted training along with KVK scientists on value addition of cereals, millets, vegetable and fruits through hygienic and scientific methods. A self help group of 20 women in Ganjam district was formed and named 'Basudha'. They were facilitated to open an account in Rushikulya Gramya Bank for getting financial support from NABARD. Linkage was also established with District Agriculture Department to get support for selling their products. The group started preparing ragi flour, ragi laddo, ragi cake and were selling in the nearby local markets. They adopted hot water treatment to improve shelf life of good quality mangoes for getting better value.

Table 2.1.11 **Economic value of processed products after intervention in Ganjam district (n=50)**

Product	Traditional practices	Market value	Intervention	Expected market price
Ragi	Making powder with traditional chakki	Ragi powder: Rs.20/kg (without pack)	• Millet pulveriser • Sealing Machine • Oven	Ragi powder: Rs.30/kg Laddo: Rs.50/500gm Biscuit: Rs.60/500gm
Tomato	Raw tomato for cooking	Rs.15/kg	• Dehydration • Value addition	Pickles (Sweet/Spices): Rs.40 to Rs.50/kg
Mango	Salt drying	Rs.20/kg	• Dehydration • Value addition	Rs.30/kg
	Pickles	Rs.50/500gm		Rs.70/500 gm (pack)
Cashew nut	Roasting in fire and deshelling by hand	Rs.100 to Rs.150/kg	• Quality processing of nuts • Salted nuts	Rs.400/kg/pack

Based on the experiences gained from the study a schematic model was prepared in consultation with the stakeholders who are directly linked with the tribal women. The income of tribal women increased through suitable intervention of technologies and increased access to different facilities.

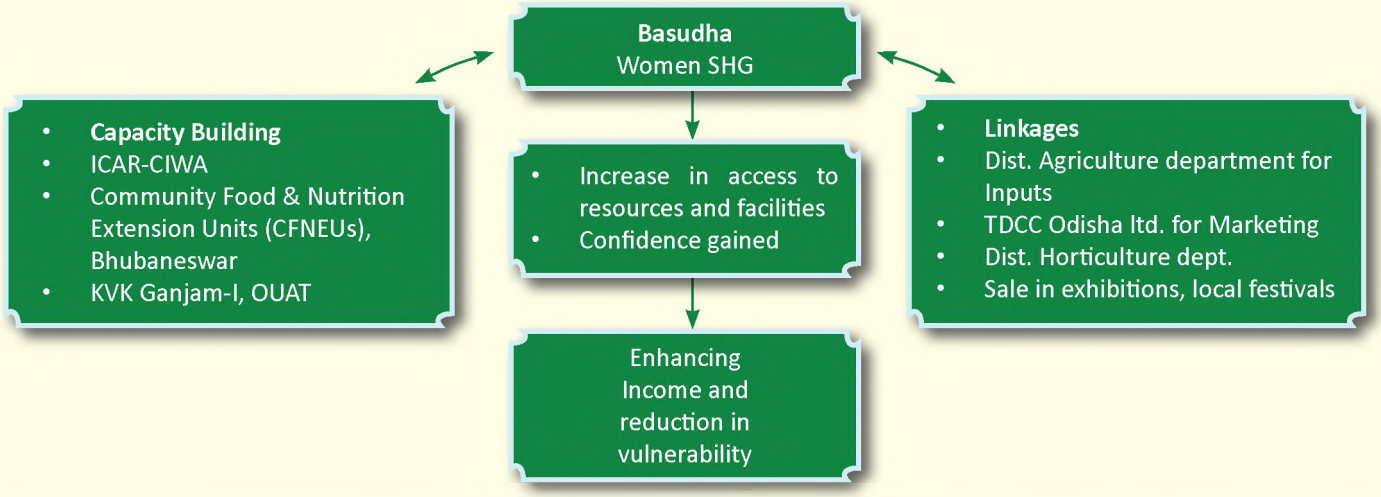

Fig 2.1.7 Schematic Model for Establishing Small Scale Enterprise

2.1.15 Design and development of disc type ridger for farm women

Chaitrali S. Mhatre, Gayatri Maharana

Women are involved in different drudgery prone activities such as weeding, ridge making, harvesting etc. across the various production systems. Ridge making or earthing-up of crops is an important operation for many crops like potato, groundnut etc. It buries the normally above-ground part of the plant, promoting desired growth. Traditionally ridge making is activity done by women in squatting or bending posture using a short handled spade. As women perform these activities they are subject to various Musculo Skeletal Disorders (MSDs), especially lower back pain. If a women bends over until the upper part of the body is nearly horizontal, then the leverage effect imposes very heavy pressure on the discs between the lumbar vertebrae. The existing hand ridgers have twin-blade geometry; it involves sliding action of the soil over the surface of the tool, causing friction thus negatively affecting the draft requirement of the tool.

The draft requirement of the existing manual ridgers was quantified. The force required ranged from 6-14 kgf. It was found out that the unit draft of the soil was 0.27 kgf/cm^2. Two model prototypes of disc ridger based on the anthropometry and strength of farm women were developed and tested for operational parameters viz., width of ridge, height of ridge .

Prototype I :The first prototye was developed by replacing the fixed curved soil working element of existing hand ridger with the rotating discs. The mounting frame sturcture was retained from the original design. This frame needed two person for operating the tool in pushing and pulling action

Prototype II: The second prototype also used disc as soil working element, further the mounting frame was modified to accomodate only single person in pushing mode to operate the tool.

From the above mentioned prototypes, prototype II forms acceptable ridges with respect to height (8-10 cm) and width (23-25 cm). Prototype II having disc angle 35° and tilt angle 23° was developed. Adjustments were given for the discs at an interval of 5 cm, so that the width of operation could be adjusted as per crop requirement.

Front handle is used for generating forward motion by pulling action. It is operated by labour walking in the front of ridger, with handle held in the position as shown in the figure. The back handle is used to generate depth of cut. The operator has to push the discs downward rather than forward to cut the soil. This soil is then lifted and partially inverted inwards to form the ridges.

ICAR-CIWA disc type ridger for farm women

The back handle on existing ridger does not have proper grip to generate enough downward force without causing slippage of hand. As the surface area of handle is low as compared to the force that has to be transmitted through it, the palms of hands are subjected to stress. This leads to localised pain in the palms and wrist of the operator. To overcome this problem, a new design of handle was developed where, the arms rest on the handle. Hence, there is more contact surface available to the body to transmit the force without causing localised stress condition, thus avoiding pain and drudgery.

During operation, moist soils adhere to the surface of disc, thereby, restricting the motion of disc. Due to this in the next turn of the disc, depth of cut is reduced, thus less amount of soil is lifted and inverted to form ridge. These issues can be addressed by fixing a scraper to the disc for removal of soil. It was observed that when discs are adjusted for a lower width, soil gets clogged between the discs. Hence it was recommended to keep the width between the discs above 10 cm.

2.1.16 Development of gender sensitive entrepreneurship model through Institute-Industry-Stakeholders Linkage in convergence mode (Extramural Research Project, ICAR, New Delhi)

Lipi Das, S. K. Srivastava, B. Sahoo, Gayatri Moharana, Ankita Sahu

Under this project, three major sectors *viz*., horticulture, dairy and farm implements for establishing institute-industry-women farmers' linkage have been identified. For horticulture sector (mango and cashew) Dhenkanal and Puri districts; for dairy sector Cuttack and Puri districts and for farm implements Cuttack and Khorda districts were selected. Two industries each in dairy sector (OMFED and Milk Mantra); horticulture sector (Art of organic and Kamal Enterprise) and farm implements sector (UNICUS and Sai Shakti Industry) have been taken up for this purpose. A survey of participating 100 farm women from each sector was conducted on their role performance, needs, perceptions and constraints through a well developed interview schedule to understand the women and gender issues in selected agro-based industries.

Table 2.1.12 **Needs of the women farmers working in horticulture-based Industries**

S. No.	Needs	Rank
1	Women friendly tools/ equipments for harvesting	I
2	Protective clothing	II
3	Training on value addition	III
4	Training on post harvest management	IV
5	Processing industries	V

Horticulture Sector: Needs of farm women engaged in the horticulture industry were identified and the most important needs were women friendly tools/ equipments for harvesting, protective clothing and training on value addition in horticulture. Regarding role performance of farm women in cashew industry, more than 94 percent of grading, sorting, and collection was mostly done by women. In industries mainly manual packaging was done by 80 percent of women and 40 percent of women engaged in harvesting of fruits. The major perceived constraints in order of ranking were 'lack of women friendly small tools and equipments' (95%), 'processing industries' (95%), 'lack of technical skills' (88%) and 'displacement of labour due to contract farming' (88%).

Participation of farm woman in cashew industry

Interaction with Milk mantra officials

Dairy Sector: It was found that the role of women in dairy industry is extensive in the production phase, where as the involvement of women in processing activities remains shoddy. The primary reason/ perceptions for the poor involvement of women in dairy industries were identified as:

Table 2.1.13 **Gender issues in dairy-based Industries**

S.No.	Issues Identified	Rank
1	Perception that industry is mainly men dominated	I
2	Heavily mechanized industry	II
3	Lack of training on mechanization aspects in dairy sector	III
4	Transportation of finished products is also perceived to be men's forte	IV
5	Manual jobs in the industry requires power lifting suitable for men	V

The findings indicated that 100 percent of farm women participated in disposal of fresh cow dung and making cow dung cake for fuel and preparation of value added products from milk closely followed by cleaning of cowshed (95%), cleaning and grooming of cows/ cattles (94%). Surprisingly only 30 percent of women responded that they themselves were involved in milking, rest 70 percent said milking was a shared activity done by both male and female depending on the time available. Only 35 percent of women agreed for selling milk or carrying to the collection centre whereas otherwise mostly were dependent on male counterparts, the reason stated behind was the weight factor which restricted women to involve in this activity. As low as only 12 percent of women had access to credit needs real attention.

Mechanization: Majority of the respondents opined that it was a male dominated sector which ranked first followed by increase in existing work load ranked second and strength demanding works ranked third, respectively. The constraints in farm implements and machineries sector for women farmers were analyzed and the major constraint was the 'nature of industrial farm implement production is hazardous' as expressed by 100 percent of farm women followed by 'male dominated job and requires high physical strength' (95%) and 'lack of proper technical education and training for this particular sector' (90%).

Table 2.1.14 **Perception of farm women involved in Farm Implements Industry**

S. No.	Perception of farm women	Rank
1	Male dominated sector	I
2	Strength demanding work	II
3	Increase in existing work load	III
4	Women can't operate electrical tools	IV
5	More physical work	V

2.1.17 Increasing productivity of rice-based cropping systems and farmers income in Odisha (IRRI-CIWA collaborative project)

A. K. Panda, J. Charles Jeeva, Sabita Mishra, Jyoti Nayak, Ananta Sarkar

The project was undertaken with the objectives of inclusive development through knowledge, innovative extension methods, networks and capacity building in Odisha for realizing higher productivity and income in rice based cropping system. Under this, several training programmes on women leadership for impact in agriculture development were conducted. The project was implemented through three project partners viz. Pragati, Koraput; BSSS, Balasore and SWAD, Puri.

Pragati, Koraput was awarded with the project on "Empowering women farmers for collective marketing of aromatic rice through a women farmers' producer company". The producer groups were formed and trained on processing and marketing of aromatic rice varieties viz. Kalajeera, Basubhoga, Gobindabhoga, Geetanjali, Samudrabali and Dhalamali. The women group produced 6786 quintal of aromatic paddy from 612 acre of land. They have marketed 2650 quintal of paddy with an average price of Rs.2200/quintal. These 20 producer groups processed and marketed around 375 quintal of aromatic rice and 36 quintal of paddy seed. Almost 136 women farmers participated in seed fairs or contributed to community seed banks (individually or collectively). Eight producer groups processed and marketed aromatic rice mobilizing 1000 women farmers through Chitri Dora Farmers Producer Company in Koraput district of Odisha.

Balasore Social Service Society (BSSS), Balasore was awarded with the project on "Innovations in the training of women farmers in quality seed production". Three hundred farmwomen were trained on modern agricultural practices and storing quality seeds for themselves. The training component included improved package of practices on paddy cultivation viz., seed treatment, line transplanting, INM, IPM and post-harvest management. The women farmers showcased five plots (each of 1 acre) in kharif season using their own seeds. Replacing local varieties with traditional method of paddy cultivation by high yielding varieties (DRR-42 & DRR-44) with improved package of practices enhanced the productivity (37%) of paddy.

Society for Women Action Development (SWAD), Satyabadi was awarded a project entitled "Creating cropping system resilience for communities through flood tolerant rice seeds and pulse: An enterprise led by women farmers". Five hundred farm women were imparted training on improved package of practices on paddy cultivation. All the women leaders (20) were actively involved in selection and procurement of seeds, and the stress tolerant rice variety Swarna sub-1 was selected for cultivation. The women farmers showcased 25 plots in Nimapara, Delanga and Satyabadi blocks which was facilitated by SWAD. Adoption of improved package of practices and cultivation of Swarna sub-1 variety of paddy resulted in 20% more yield than the average yield.

Annual review workshop under the ICAR-CIWA-IRRI Collaborative Project

The annual review workshop was organized at ICAR-CIWA, Bhubaneswar on 27 June, 2019 in which the progress of each project was reviewed in the presence of IRRI and CIWA team and the future course of action was finalized. A Farmer-Scientist Interface was organized on 15 July, 2019 at Satyabadi block, Puri district in association with the project partner SWAD. In this interface, scientists from CIWA emphasized on use of stress tolerant paddy varieties as the project area is mostly disaster prone with recurrence of flood and water logging conditions which mostly affect the rice crop. On this occasion, 20 quintals of foundation seeds of CR1009-Sub-1 variety were distributed to 100 SC beneficiaries for varietal replacement in about 150 acres. An interaction meeting with the grantee partners (SWAD and Pragati) was organised on 11 September 2019 at ICAR-CIWA. A farmers -scientists interface was organized on 4 December 2019 at Satyabadi block, Puri in which about 50 women farmers from 20 SHG of Satyabadi, Delanga and Nimapara block participated. As part of the programme, IRRI super bags were also distributed among 500 women farmers for safe storage of seeds.

Farmers-scientists interface and distribution of IRRI Super bags at Satyabadi, Puri

2.1.18 Empowering women farmers through promotion of gender friendly farm equipment (PRERNA: ICAR-CIWA, Mahindra & Mahindra Ltd and PRADAN collaborative project)

Gayatri Moharana, Jyoti Nayak, Chaitrali S. Mhatre

The project has been conceived in a collaborative mode, funded by Mahindra & Mahindra, with the partnership of ICAR-CIWA-PRADAN which intends to use a combination of carefully sequenced supports to reduce the women's drudgery issues in paddy, ragi (millet) and vegetables based farm operations, increase their work efficiency and income. A total of 42 villages covering 1800 farm women from Jasipur block of Mayurbhanj and Lamtaput block of Koraput district located at northern and southern part of Odisha where paddy and vegetables are the major crops cultivated by the farm families were selected. On-farm skill demonstration by resource farmers, refresher trainings at cluster level, interactive session with scientists, exposure visits and linkage with service/ repair centres etc. were conducted. In each village custom hiring centre (CHC) was identified and set up by cluster or village level organization.

Output/ productivity of the tools and implements were more than 90 percent in case of all the 14 tools (11 tools are hand operated and 3 tools are power operated) distributed in CHC. Majority of the respondents expressed their happiness towards improved tools. All of them expressed that tools are efficient to reduce drudgery of both farm men and women, reduce workload of women, and boost efficiency and

productivity of both the genders and also work with less and easily accessible inputs. These have been adoptable with the existing skill of both the genders and having potential of contributing to livelihood component of farm men and women. About 60 percent of them expressed that dry land weeder, SRI marker and battery operated sprayer are most effective whereas about 46 percent respondents told that Mandwa weeder, Pedal thresher, Winnower, Hanging type grain cleaner were more effective, very easy to handle, required little time and energy. These also save time and money.

Table 2.1.15 **Effectiveness of tools in Mayurbhanj and Koraput (%)**

S. No.	Name of the tools	Effectiveness (n=360)				
		Not	Less	Effective	More	Most
1	Seed treatment drum	0	0	23.1	47.5	29.4
2	Mandwa weeder	0	0	13.9	46.7	39.4
3	Finger weeder	0	0	18.3	45.0	36.7
4	Dryland weeder	0	0	11.5	28.5	60.0
5	Improved sickle	0	0	16.9	50.8	32.2
6	Pedal operated thresher	0	0	18.6	45.3	36.1
7	Hand winnower	0	0	17.2	46.9	35.8
8	Hanging type grain cleaner	0	0	15.8	48.9	35.3
9	Parboiling drum	0	0	15.6	46.4	38.1
10	Battery operated sprayers	0	0	9.5	28.5	62.0
11	SRI marker	0	0	22.6	35.4	42.0

After training and demonstration at field level, it was observed that women farmers are being now a bit pro on use of farm tools. For the first time, they were able to access and control over farm tools. In tribal villages women farmers are breaking stereo types of using sprayer which was a remarkable change. They enjoyed their work by using improved farm tools/ implements/ machineries. Battery sprayer and weeders were liked by most of the farm women whereas manual paddy winnower was least preferred. Spraying was a dependent (as only man has the control on it) and painful (manual spray) activity to a farm woman but battery sprayer has largely sorted out these two problems. Weeding is another time taking, laborious work for a farm woman; mandwa weeder made weeding easy and saves time also. In most of the villages, only farm woman is available for winnowing work in the household whereas manual winnower requires at least two people to operate. So the machine can be modified to power operated.

It was observed that tribal women of Odisha especially from Koraput and Mayurbhanj were earlier using old/ traditional tools and equipment to perform various activities which are not suitable and women friendly due to its heavy weight or other features matching to physiology of men. They were performing very tedious task leads to drudgery and occupational health hazards. Due to these they were suffering from various health related issues. Apart from these, they spent huge amount of money towards wage. After the intervention of drudgery reducing women friendly tools and implements, they got awareness. It also changed their knowledge, skill and attitude which helped them to use improved tools at their field. By using these they were able to save their energy, time and money. They got enough leisure time which were utilized by them in other household and income generation activities in agriculture and allied sectors.

Training & demonstration of farm tools and implements at Koraput and Mayurbhanj district

2.1.19 Adding value to fish: a potential livelihood option for rural women of Odisha (DSIR funded)

Tanuja S., J. Charles Jeeva

Perceived occupational needs of fisherwomen were studied through survey of 200 fisherwomen selected from 20 different SHG groups from Astaranga and Puri Sadar blocks of Puri District, Odisha. All the women responded that credit is their most important need. Ninety two percent women responded that safeguard against unfair trading practices is most important for them to remain in the profession. Training in fish processing and value addition and access to extension services were considered to be most important need by 90 percent women. All the women responded that site management is the least important need for them and 90 percent of them felt property right is less important for them to carry out the drying activities. More than fifty percent of the women said that in order to take up hygienic drying practices, assurance on marketing is the most important thing.

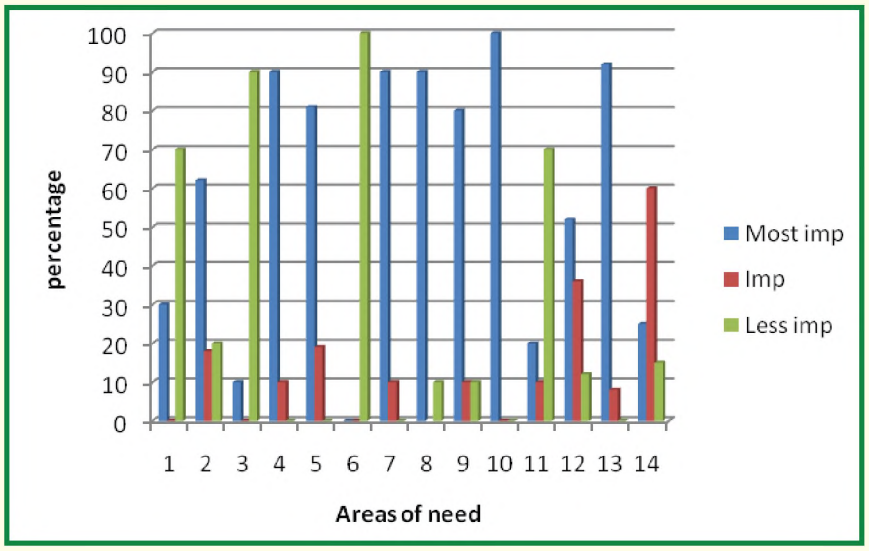

Fig 2.1.8 Perceived occupational needs of fisherwomen (1. Social support, 2. Support from counterpart, 3. Property right, 4. Timely availability of fish, 5. Quality of fish, 6. Site management, 7. Training in fish processing and value addition, 8. Access to extension services, 9. Exposure visits, 10. Credit, 11. Marketing, 12, marketing of hygienic produce, 13. Safeguard against unfair transactions, 14. Packaging and transport)

Access to Resources: In order to equip the fisherwomen with adequate knowledge and skill on scientific and hygienic preparation of value added fish products and by products as potential livelihood option, several capacity building programmes were conducted. The value added products about which the skills were imparted to fisherwomen, were finalized based on the assessment of consumer preferences on the parameters such as, the consumption pattern of fish, awareness on the health benefits of fish, awareness on quality attributes of fish, consumer perception towards the different value added fish products with respect to its price, taste, flavor, appearance, packing etc.

Table 2.1.16 **Knowledge level of producers on scientific dry curing of fish**

Steps in scientific dry curing of fish	Knowledge level of producers (%) (N=200)	
	Before commencement of project	After capacity building on scientific curing of fish
Washing and grading of fish	75	100
Gutting and cleaning	60	75
Amount of salt	20	60
Quality of salt	20	55
Method of salting	25	80
Duration of salting	50	70
Knowledge on improved drying methods	30	40
Knowhow on quality parameters of dry fish	10	40
Packaging	12	50
Maintenance of hygiene	20	70

As per the survey report price, taste, health factor are the most important attributes which consumers look for in a value added fish product. Different innovative value added products like fish chutney powder, prawn badi, fish papad, fish cutlet, fish momos and organic manure from fish silage has been prepared and the recipe has been standardized. A knowledge attitude and skill test was conducted to assess the extent of awareness of dryfish producers on the scientific dry curing of fish. Consumer perception on value added products (VAP) were studied by conducting a survey of 150 urban consumers of Odisha. Majority (33.33%) of the consumers were of the opinion that the type of value added fish products available in the market is limited when compared to chicken and vegetarian (veg) products. This is true in the case of state like Odisha, where the only form of VAP of fish available is dry fish. Consumers were aware (26.67%) that the VAP are convenience products which are easy to cook. Thirty percent consumers opined that they will be willing to buy VAP products of fish if they are available in prices comparable to that of chicken/ veg products. Consumers were also keen on the safety aspects. Majority of them were of the opinion that the VAP from fish should be available locally for them to consume. This shows that Odisha has a potential market for different value added fish products. All the consumers were interested in consuming one or other forms of VAP from fish. Half of the consumers (50%) were interested to consume fish cutlet. The next highest demand was for solar dried fish (44%). Almost, 80 percent of the consumers were not willing to pay a higher price for hygienically dried fish. This points to the unawareness of consumers about the advantages of hygienic drying of fish. The consumers though willing to purchase value added fish products were not ready to spend the prevailing market rates of these products in states outside Odisha. The main reason that could be attributed is the non existence of these kinds of products in the Odisha market which makes it impossible for the consumers to assess the price.

2.1.20 All India Coordinated Research Project on Ergonomics and Safety in Agriculture

Chaitrali S. Mhatre, Jyoti Nayak

Sub-Project 1: Design and development of multipurpose harvesting bag for easy loading and unloading

An easy harvest bag was designed to reduce the drudgery and time required in the harvesting operation. The use of bag reduces the effort of the extensor muscle by 23 to 55 percent, also reducing the force exerted on the L5/S1 joint. For both male and female the capacity of picking increases and the work pulse (ΔHR) decreases when the subject uses the developed harvesting bag for all postures except squatting. Overall there is reduction of 15-25 percent in drudgery index and 20-30 percent reduction of perceived pain during operation varying with crop. An extensive physiological test was done on the subjects while wearing the harvesting bag. A test protocol was designed for testing the bag on the treadmill. The ΔHR for male and female both are lower than the limit of continuous performance (LCP) and the VO2 consumption of female and male is also lower than the allowable work load (AWL). The postural analysis was done using biomechanical principles. It was concluded that if the load is head mounted the centre of gravity of the body shifts upwards. This leads to increased possibility of imbalance and the use of the bag shifts the centre of gravity lower which increases the stability.

Sub-Project 2: Design and development of women friendly power operated groundnut stripper cum decorticator

Post-harvest activities in ground nut include stripping pods from plants and then removing kernel from pod. For decorticating, use of existing manual decorticator is time consuming and drudgery prone (repetitive to-and-fro action). Separate high capacity groundnut thresher and groundnut decorticator are available in the market. But these are recommended for the large-scale farmers (land holding >10 ha), as they are costly. Hence power operated groundnut stripper cum decorticator was developed which is cost-effective, hence, affordable to women farmers, marginal and small-scale farmers. Extensive field trial as per IS 11234-1985 was done to evaluate the performance of the developed equipment for groundnut stripping.

Table 2.1.17 **Performance evaluation of equipment for groundnut stripping**

Performance parameters	Values
Threshing efficiency (%)	94.39
Cleaning efficiency (%)	85.64
Feed rate (kg/hr)	29.97
Output capacity (kg/hr)	12.12
Broken (%)	3.59
Spilled (%)	1.90

After economic analysis, it was found that for manual stripper the cost of stripping is Rs.4.57/kg output, at the same time, for developed power operated groundnut stripper it is Rs.4.2/kg output. The developed and existing decorticators were tested as per IS 11473:2002. The results of the same are tabulated below.

Table 2.1.18 **Performance evaluation of equipment for groundnut decortication**

Particulars	Existing	Developed
Feed rate (kg/hr)	35.35	29.76
Decorticating efficiency (%)	95.90	91.7
Broken (%)	10.38	11.50
Blown (%)	2.55	-
Cost (₹.)	23850	12000 (approx.)

ICAR-CIWA power operated women friendly groundnut stripper cum decorticator

Sub-Project 3: Level of mechanization among rural farm women: assessment and intervention

Women have lagged behind their male colleagues in using improved crop production and processing tools and machinery. To ensure that the women are equal beneficiaries of the agricultural mechanization, it is necessary to develop women-oriented training modules, machines, equipments, tools etc. But to successfully implement a programme a researcher also needs to study the root cause of the problem. In the present context it is "lower level of mechanization among the farm women". But there is no such standardized tool/ index available for assessing the same.

Hence, a scale was conceptualized. The questionnaire containing five dimensions and 33 indicators was developed and circulated to 50 experts in the field of extension, farm machinery, home science, ergonomics, gender studies, rural development etc. for recommendations. After careful scrutiny of those who had responded in the stipulated time, 30 were considered to study relevancy of indicators. After analysis and incorporation of the suggestion, total 31 number of questions were finalized. Data was collected from respondents of four villages/ towns of Odisha and Gujarat. Three out of four are known sample group. Analysis of the data was done to arrive to the scale values of dimensions.

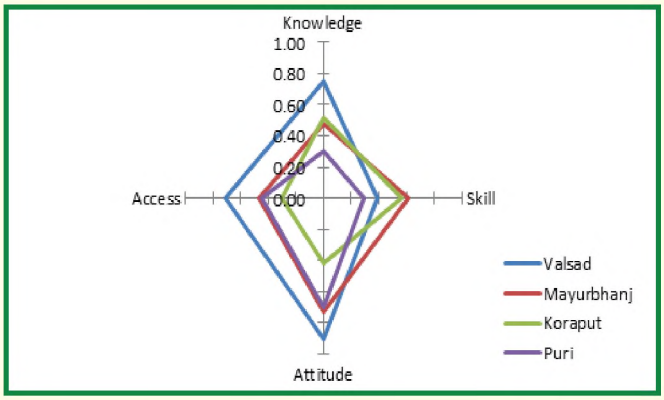

Fig 2.1.9 Graphical representation of the knowledge, skill, attitude and access of the farm women with regards to farm mechanization

From this, it can be concluded that knowledge and skill of the Mayurbhanj and Koraput district is higher than the Puri district as they have been imparted training regarding farm mechanization. Access of Koraput district is least as it is situated in a remote location still not completely nil as custom hiring centres have been established in the villages. Access of Valsad is highest as it has higher number of towns. Attitude of Valsad farm women is highest as they are trainees and hence have positive mindset towards farm mechanization. Mayurbhanj has almost same access as that of Puri even though it is situated far away from Bhubaneswar as it has custom hiring centre established in the villages. Thus the above information will help the researcher to strategize the mechanization for successful implementation in their programmes.

2.2 RESEARCH ACHIEVEMENTS (AICRP on Home Science)

2.2.1 Development of region specific therapeutic foods for prevention of diabetes

A total of 362 foods from different food groups having low Glycemic Index (GI) or hypoglycemic properties were documented and a database on low GI foods for the management of diabetes was prepared. This document was also prepared in regional language by all the centre and was published as a book. A common low GI food mix was developed by using locally available low GI ingredients such as: cereals and millets, pulses and legumes, green leafy vegetables, herbs and medicinal, spices, nuts and oilseeds and other vegetables like bitter gourd. The standardized low GI traditional food products were evaluated organoleptically for various quality attributes like colour, appearance, flavour, texture, taste and overall acceptability and the sensory scores of the recipes were found to be acceptable. The mean scores of overall acceptability of the modified products (6.35 - 8.80) implied that they were 'liked moderately' to 'liked very much'.

Effect of developed low glycemic regional foods on pre-diabetic subjects

The low GI of functional foods developed were tested through feeding trial among pre-diabetic farm women with an aim to substantiate the health claim of the developed low GI foods over a three months experiment trial. The developed foods were found to be effective in maintaining blood sugar levels within normal levels and in reverting pre-diabetic status. Since the developed low GI foods/mix is based on region specific locally cultivated/ available foods, the functional foods developed through the research confers good consumer acceptance with promise of sustainability and significant health benefits. The anthropometric parameters of volunteers selected are mean height, weight and BMI. The mean height and weight of the subjects were observed to be in the range of 153cm (AAU) to 164.86cm (PJTSAU). The calculated mean BMI of the subjects were between 19.96kg/m^2 to 26.15kg/m^2, which falls under the category of normal individual according to WHO classification of body mass index for Asians. The GI of the modified food products was determined using standard method and ranged from 20.9 (Barley *Dalia*- GBPUAT centre) to 55.0 (*Khakra* prepared from multigrain mix 1 & 2- MPUAT centre).

The low GI functional foods developed were tested on 30 selected pre-diabetic farm women and experimental group with another 30 farm women and control group by dietary interventions through intervention feeding trial among prediabetic farm women with an aim to substantiate the health claim of the developed low GI foods over a three months experiment trial. The developed foods were found to be effective in maintaining blood sugar levels within normal levels and in reverting pre-diabetic status. The food mix was found to be lower FBS and HB A1C after 120 days of intervention in experimental group. It was found that developed products are suitable to maintain blood sugar level within the limit. The lipid profile of experimental subjects was found to vary from pre to post which was statistically significant among subjects of Johrat and Hyderabad centre, whereas the difference was non-significant among subjects of remaining centre.

2.2.2 Dietary approach for management of dual burden of malnutrition among farm women

Formulation of high fibre multigrain mix from locally available cereals, millets, pulses and other functional food ingredients (FFIs) for management of over nutrition

The products of high fibre multigrain mix have been formulated from locally available cereals, millets, pulses and other functional food ingredients (FFIs) for management of over nutrition/ obesity. A common multigrain Ready to Use (RTU) mix was developed using fibre rich locally available food ingredients such as wheat, red rice, pearl millet, maize, pulses and legumes, fenugreek leaves & seeds, mint, drumstick leaves, curry leaves, chillies, groundnut, flax seeds, ginger, cumin, etc. The developed mix has been used for the preparation of daily consumed traditional foods. The flours were mixed in standardized proportion and stored for further product development and analysis. The results for sensory evaluation of developed products from RTU high fibre multigrain mix revealed that the overall acceptability scores were highest in TNAU i.e., paniyaram (8.9), adai (8.8), health drink (8.8), chapatti (8.5), cookies (8.5) and nutri ball (8.5) and the lowest acceptability was obtained by CSHKPKV i.e., bhatura (6.93) and chapatti (6.98).

The nutritional status of selected farm women was assessed for selection of volunteers for conduct of the clinical efficacy trial of the high fibre mix. The feeding intervention trial with the high fibre mix based foods was implemented among 35 over weight farm women with a matching control group. The effect of dietary intervention on anthropometric profile, clinical signs and symptoms, biochemical profile and dietary survey was assessed. The pre and post mean food and nutrient intake of control and experimental subjects were calculated and analysed. Significant reduction in the intake of carbohydrate and energy

was observed in experimental study of Bangalore, Tamil Nadu and Hyderabad centre. Bangalore centre also showed significant reduction in the intake of fat. A significant reduction in all biochemical parameters such as total serum cholesterol, triglyceride, LDL and HDL was observed among experimental subjects of Assam centre. Bangalore and Hyderabad showed significant reduction in total cholesterol and LDL. The dietary intervention using developed high fibre mix was found to reduce the body weight which was statistically significant in some centre. Developed products was suitable to reduce body weight and the mix is based on region specific foods which can blend well in preparing traditional foods of daily diet.

Formulation of nutrient dense multigrain mix from locally available cereals, millets, pulses and other FFIS for management of under nutrition

Region specific nutri-dense ready to use mix with focus on high calorie, high protein and micronutrient rich convenience mix was developed by each AICRP unit. Diversified foods and underutilized plant foods sourced from locally available food systems were used in the development of the Nutri-dense mix with an aim to deliver an affordable and nutritious health mix suitable for management of under-nutrition. A total of 28 products were developed by each centre from the nutri-dense mix and the recipes were standardized on subjecting to sensory evaluation. The data revealed that the mean scores of overall acceptability of the developed products were in the range of 6.98 - 8.90 indicating that they were 'liked moderately' to 'liked very much'. The highest overall acceptability was obtained in the products prepared by TNAU i.e., cookies (8.9), nutri ball and roti (8.8), adai (8.7) followed by VNMKV and AAU i.e., biscuit (8.8) and protein energy bar (8.7) respectively.

The proximate composition, mineral composition and dietary fibre of the formulated mixes were analyzed using standard methods. The protein content of mix for under nutrition was in the range of 14.64 to 39.2g/100. The fat and energy contents were highest in the mix developed by VNMKV (17.15g, 446), crude fibre and iron in TNAU (5.94g, 7.49mg), carbohydrate in AAU (67.62g), total dietary fibre in PJTSAU (30.2g), calcium and zinc in UASB (275mg and 3.98mg) /100 g of mix.

Clinical efficacy trials were carried out to study the effect of the nutri-dense ready to use mix among 35 selected experimental subjects (farm women), while maintaining a control group. The pre and post evaluation of the nutritional status of the selected subjects prior and post dietary intervention of three months duration was analysed. The haemoglobin content of the control group ranged from 8.07 g/dl (PJTSAU) to 12.05g/dl (UASB), whereas in experimental group it ranged from 7.55mg/dl (PJTSAU) to 11.23mg/dl (UASB). The dietary intervention brought about significant increase in haemoglobin level of the experimental groups as observed by all the AICRP Units on comparison of the respective biochemical parameters during the pre and post dietary intervention state.

It was observed that the dietary intervention for 120 days using nutridense food mix products was found to increase body weight in experimental group in all the centre. Developed products are suitable for under nourished having low BMI. Since it is based on locally available ingredients, it is affordable, available and acceptable. Obesity is a major risk factor for most of the non-communicable disorders. Hence, there is a need for creating public awareness with regard to importance of lifestyle and diet modification with high fiber foods. Inclusion of millets which are high in dietary fiber in PDS is essential.

Technologies Developed

- High Fibre Food Mix for management of obesity -12 nos
- Nutri Dense Laddu for undernourished

Technologies Commercialized

- Two MoUs were signed by AICRP (FN) UAS, GKVK, Bangalore, under ICAR-CIWA for commercialization of High Fibre Food Mix 2019-20
- An mobile app on Diet on diabetic persons was developed by AAU, Jorhat Centre

2.2.3 Sustainable livelihood security of rural families through locally available natural resources

Comprehensive use of underutilized natural fibres and plant sources for sustainable livelihood of farm families

An effort was made to design and develop products for various end uses based on the basic properties of the selected underutilized fibres. Fibres were subjected to weaving process, nonwoven structures and composites and the details of the products designed using different fibres, along with the product details and their significant characteristics were noted according to the type of fibres. Generally 3 types of underutilized fibres were used for the development of products and for the technical use of textiles. The products designed by using different underutilized fibres such as bast fibres (Bagasse, *Hibiscus mutabilis,* Himalayan nettle, paddy), leaf/sheath fibres (agave, maize), seed hair fibre (*Calotropis procera* and Arecanut) and their significant properties were analyzed.

These products such as composite handmade papers, textile composites, fibre for dye effluent treatment, woven & non- woven fabrics, union nettle fabric, non-woven mulch mats, wall hanging, blinds, mat, casserole napkin, hot pad, sanitary napkins, furnishing

products were developed using locally available under utilized fibres and studied their properties and cost of the products calculated. Cost of developed products was calculated including the cost of raw material, accessories, labour charges, miscellaneous costs and 30 percent profit. It was noted that the cost of various products developed using the non-conventional fibre blends ranged from Rs. 80 to 600/-. For sanitary napkins: Bagasse, Agave, *Hibiscus mutabilis*, Maize, Paddy, Arecanut fibres were processed into sheets (raw material for sanitary pads) of 800gsm. The sanitary napkins produced with eco-friendly core were tested and found on par with the commercially available ones.

Properties of fabric woven using pure and blended yarn

- The maximum tearing strength of *Hibiscus mutabilis* is 38.97 kgf, thickness and GSM is 5.04 g were found in cotton rose/jute (50:50) blended yarn. Bending length of woven fabrics were found maximum (3.5cm) in cotton rose/jute 50:50
- The maximum tear strength was recorded in *Himalayan nettle*.i.e. Nettle/hersil cross blended fabric (9.2kgf), elongation (11%) and bending length (2.35 cm) in warp direction than the weft
- Paddy/cotton blended fabric had higher thickness (7.5mm), tear strength (73kgf) and elongation (78%) than the weft. Drapability percentage was higher in weft (46.83) than the warp (46.7%)
- Arecanut: Cotton hand woven union fabric measures higher tear strength(38.56kgf), elongation (26.4%) and drapability (43.96%) than the weft.

Awareness and training programmes were conducted on extraction of underutilized natural fibre and product development among the farm women of adopted villages. Trainings and awareness programmes were organized on comprehensive use of paddy fibres/paddy straw for livelihood of farm families among the local farmers and farm women. Demonstrations on extraction of fibres from waste corn husk were given to the rural women on their farms. Fibre products like scrubbers were prepared by them and distributed for trials to the user. The users of the scrubber preferred it as vessels could be cleaned effectively with less efforts and time. Several trainings on agro waste of Arecanut husk fibre processing for development of utility products was imparted to farm women and SHGs through interaction cum demonstration and workshop.

Product development of the eco- based fabric for variegated functional end uses

Under this study, clothing and gadgets for sportech, weather smartwear, hygiene products, etc. were designed, developed and evaluated functional performance of the designed products. Based on maximum total phenolic content using DMRT and excellent antibacterial activity of plant extract, two or five extracts from each centre were selected for standardizing the functional finish onto clothing material.

The developed products were evaluated and found that treated fabrics have no adverse effects on wearers. A list of apparel, medical textile and home textile articles was prepared *viz*., baby night wear, bib, diaper, feeding bottle cover, baby sheet, hand gloves, kitchen napkin and preferential choices of experts were sought on three point rating scale.

Infant garments –bib and pillow cover were developed from herbal treated cotton fabric. UV finished cotton fabric treated with *Jamun* (*Syzygium cumini*) leaf extract, pencil cactus and custard apple leaf extracts were used for scarf development and aprons for farm labourers to protect them against UV rays of sun while continuous working in fields. Pomegranate was used as an antimicrobial agent for finishing of socks and hankies for the elderly and hankies for the children. The *Lantana camara* and *Nepeta cateria* extract is coated to cotton and blended textiles through direct method for developing products. Wound healing cotton bandages were treated with antimicrobial beetle nut and ber leaf extracts for addressing and curbing skin infections.

The Minimum Inhibition Concentration (MIC) results enrooted the research forward for functional finishing of textiles using citric acid as cross linking agents. Fabrics are being finished using the selected concentration of the extract by pad-dry-cure method and by direct application method.

Awareness camp and training programme were also conducted among rural women of adopted villages regarding identification of green sources for different functional finishes on textile. Demonstration on extraction and application of green extracts were also organized. Designed clothing for the benefit of various end users is being taken forward for commercialization through KVKs by On Farm Trials and large scale demonstrations.

2.2.4 A social pursuit through popularization and product diversification of ethnic crafts on textiles with ICT application

An attempt was made to preserve, revive and popularize folk arts of the Country by using product designing and diversification techniques with ICT tools. The art forms were digitized to suit textile designing with the arts and principles of design. The fusion of folklore and textile

designing techniques were used to develop variegated products. Consumer survey to know the acceptance and preference for the designed contemporary products were assessed. Awareness and skill development training programmes were conducted at all the centre for the benefit of the artisans and women SHG members. The folklore contemporized were *Aipan*, *Chamba rumal*, Durrie, Puttapaka Ikats, Gond painting, *Sanjhi*, tie-dye, Quilt/*Kaudi*, traditional Boro Mishi of Assam and Dakmanda of Garo hills. Training of the artisans for designing the diversified products with a fusion of folklores is done.

Table 2.2.1 **Type of product developed**

Sl.No	Centre/Folk art	Products Developed
1	Aipan, GBPUAT, Pantnagar	Cushion covers, shoulder bags, stoles, shrug, clutch purse
2	Chamba rumal, CSKHPKV, Palampur	Bags, cushion covers, scarfs and stole
3	Durrie, PAU, Ludhiana	Cushion cover, pillow cover, table runner, table mat, wall hanging and tray cover
4	Durrie, HAU Hissar	Cushion cover, sofa back cover, tote bag
5	Dakmanda, Tura, Meghalaya	Dakmanda denim dresses, western outfits, embellished Dakmanda wrappers, foot wear, jewellery, office file, purses, pouch, vests, tie and bags
6	Puttapaka Ikats, PJTSAU, Hyderabad	• Ikat fabrics and converting them into 8 apparel products and home textiles (Apparels – 8, Table mats – 4, Curtain, Bed spread, Bed sheet set, Dewan set - 1, Dewan set - 2) • Diversified designs -screen designs to print home textiles (Kurthis - 2, Scarf (Dupatta), Table Cloth, and Curtain
7	Gond painting, VNMKV, Parbhani	Cushion cover, Wall portrait, Scarf (Dupatta), Table mats
8	Sanjhi, MPUAT, Udaipur	Bandarwal / toran, Thali cover, Cushion cover, Photo frame, Bags
9	Quilt/ Kaudi, UAS Dharwad	Table mats, Table covers, Table runner & mats set, Yoga mats, Baby quilt, Diwan set, Single bed spreads, Double bed spreads, Wall hangings, Bags
10	Traditional handicrafts of Assam, AAU, Jorhat	Area rug, Cushion cover, Tapestry or Wall hanging, Runner, Place mat and set

The ethnic products have to be tested for the acceptance of the fusion of art forms with the product designs. The designs have to be digitized for commercial production and a business model for each art form has to be set incorporating the information on raw material sourcing, product preparation protocol and product diversification in terms of colour and sizes *etc*. The respective artisans and Women SHG members need to be trained in the product development and entrepreneurship aspects to keep the ethnic folk arts rejuvenated.

❖ **Patents Granted/ Filed**

Patent on "Biodegradable Mesta Composite Pots for Nurseries" invented by UAS, Dharwad, one of the AICRP on Home Science Centre has been published. (Filed No: 201941031982 dated 07/08/2019; Published in Patent Office Journal dated 25/10/2019).

2.2.5 Promoting farm women knowledge groups for enhanced use of ICT in agriculture and allied sectors

A study on promoting Farm Women Knowledge Groups (FWKGs) for enhanced use of ICT in Agriculture and Allied Sectors was undertaken. The data has been collected from 1100 farm women and 1100 rural men from eleven project centre. All the respondents had knowledge about the information technology present in their surrounding in form of smart phones (72.29%) and internet (32.99%) but they had no knowledge about KIOSKs, AGRINET, Kisan Mobile Sandesh, Village Information Centre. To enhance the use of ICT tools in agriculture and allied activities, trainings were organized by the centre in which various aspects were covered i.e., sending and receiving SMS and saving contact list, use of YouTube and agricultural apps, installing and uninstalling apps, use of WhatsApp and Facebook. Linkages developed with govt. and non-government departments to organize interventions/programmes/ trainings/exposure visits etc. for the benefit of FWKGs members.

To enhance the use of ICT tools for agriculture and allied activities, all the centres exposed their groups to different aspects about use and operation of mobile phones. For this, 5-42 trainings were organised by the centre in which various aspects were covered i.e. sending and receiving SMS and saving contact list, use of YouTube and agricultural apps, Installing and uninstalling apps, use of Whats App and Facebook etc. Total beneficiaries covered at each centre ranged from 60-504, covering 1715 beneficiaries in total.

On comparison of pre and post scores of knowledge, it was found that there was significant increase in knowledge of respondents of all centres i.e. in Assam, Haryana, Karnataka, Maharashtra, Meghalaya, Punjab, Rajasthan, Tamilnadu, Telangana and Uttarakhand. Knowledge and use of selected ICT tool was also increased significantly in all the centre after intervention i.e. Assam, Karnataka, Himachal Pradesh, Maharashtra, Meghalaya, Punjab, Rajasthan, Tamilnadu, Telengana and Uttarakhand.

All the centres identified one to three technology related to agriculture and allied areas, animal husbandry and home science. Each centre identified the technologies as per their situational analysis. It was observed that technologies related to agricultural and allied area i.e. organic farming, vermicompost, nutritional garden, bee keeping, intercropping, seed treatment, diseases of rice, mushroom cultivation, green fodder were identified and homestead technology were prevention of anemia and ragi malt preparation and technologies related to animal husbandry were chosen. These technologies were converted into simple text and picture messages and in some videos also. Then these packages were validated and tested by specialists for their effectiveness. Each state converted content into 10-55 text messages and 5-17 picture messages. Whereas 1-5 videos also downloaded from the internet related to the content then these packages were disseminated through WhatsApp and provided to the respondents in the form of mobile chip.

Impact of ICT packages: There was significant impact of practice of the technology dissemination on knowledge in all the States except Meghalaya. Significant and positive effect of interventions on the knowledge of the respondents of all the states i.e. Assam, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, Rajasthan, Tamilnadu, Telangana and Uttarakhand were observed. For adoption of disseminated technologies, it was found that in all states the percentage was 13-33 percent in no adoption category except Rajasthan. It was 63 percent respondents who had not adopted any practice as exposed through WhatsApp. Whereas complete adoption of technology disseminated was 10-30 percent in Himachal Pradesh, Karnataka and Assam. In some states it was observed as 38-41 percent complete adoption. It was encouraging to note that complete adoption of technologies was there in Punjab, Telangana and Tamilnadu i.e. 66, 70 and 83 percent, respectively.

Linkages of farm women groups with agencies / organizations /departments

Linkages developed by the centre with other departments to organise interventions/ programmes/ trainings/ exposure visits etc. KVKs, Department of Agro Metrology, Fishery, Veterinary, Horticulture, Forestry guardians, Crop physiology, Women and Child Welfare department, Block Development Officers, Panchayats of good governance guardian, CRIDA, society for elimination of rural poverty etc. were the govt. and non-government with whom all states developed linkages for the benefit of FWKGs members.

2.2.6 Empowerment of farm women on climate change

The data on knowledge of 1100 rural women regarding causes of climate change was collected to find out whether they know the factors responsible for climate change. The extent of awareness on indicators on climate change revealed that half of the respondents were in medium level of awareness, 41.7 percent in low category which was an indicator of high concern in raising the awareness level of the farm women. Based on the constraints faced by the farm women due to the effects of climate change different region specific climate interventions were provided which are classified under four modules. Those were community specific, farm specific, livestock specific and household specific interventions. Out of these four modules three specific modules were taken up by each centre depending on the availability of resources.

The data regarding level of awareness of causes for climate change were also collected. It was observed that before intervention, a majority of the respondents (71-100%) had low awareness, their mean score also depicted the same scenario. These states were Karnataka, Meghalaya, Punjab & Telangana. In rest of the states there was medium awareness among the respondents about different causes of climate change. After intervention, majority of the respondents from almost all the states shifted in high level of awareness category. Data further clarifies that in Uttarakhand, it was 100 percent, in Meghalaya, it was 98 percent, in Karnataka, 94 percent, in Telangana (86%) whereas in Rajasthan (83%), in Maharashtra (80%) and the percentage were nearly half in Himachal Pradesh (47%) and Haryana (55%). It was observed that only 8 percent from Assam were in high category of awareness as majority (88%) of these shifted in medium level of awareness category for causes of climate change.

Climate smart interventions in the selected village

The situational analysis for climate smart intervention was done in different villages in all States. To make more aware about climate smart interventions, all the centre in 12 states organized group discussions and interface with scientist to the women. Awareness rallies, farmer's scientist interactions and street plays were organized by all the centre. Community specific, farm specific, livestock specific and household specific interventions were given by all the centre. The emphasis on saving water and energy proved to be very beneficial for

household and animal husbandry with adoption of simple solar devices, replacement of florescent bulbs with LED lights, water saving practices in cleaning and washing both of the house and cattle shed, cattle bathing, removal of water filters where water was already potable etc. The application of vermicompost was proven to increase fertility, water retention and carbon sequestration in soil and increased yield. In addition to higher yields, women immediately realize savings from the non-application of chemical fertilizers, which not only depletes soil fertility in the long-term, but also represents a costly expense for low-income farmers (approximately Rs. 20, 000 per acre/year) and the selling price of Rs 10, 000 per ton of vermicompost on an average was also observed.

Regarding adoption of coping strategies by the farm women, it was found that 39.63 percent changed their planting calendar, 36.09 percent adopted inter cropping, diversification of crop was adopted by 32.27 percent, nearly 31 percent changed traditional irrigation method and shifted from mono cropping to integrated farming system and 29 percent adopted crop rotation. The farm related module particularly diversification, selection of varieties, practices to save water and energy, soil improvement practices proved to be economically beneficial to the selected families.

2.2.7 Scoping IFS models from gender perspective with focus on enhancing farm income

The project on ''Scoping IFS models from gender perspective with focus on enhancing farm income'' has been undertaken with the objectives to region specific tested IFS models for enhancing farm income, to screen the selected models from gender perspective and to diffuse the learning/ lessons from identified models in the adopted villages. Different models were identified for implementation and studied from gender perspective in view of the role of women in agriculture and allied activities. The scoping was done in view of the data on participation and decision-making pattern generated under the extension component of AICRP on Home Science. Altogether thirty IFS models have been enlisted with their economic returns for further analysis. Common IFS model in all centers identified as crop, vermicompost, horticulture, dairy and vegetable production. Other identified IFS models were bee keeping, apiary, mushroom production, paddy, kitchen gardening/nutritional gardening, goatery, poultry, duckery, fodder and livestock etc.

2.2.8 Drudgery reducing farm technologies for gender equity

To characterize drudgery of women in production system, experiments were conducted in operational villages selected by each centre following the criteria of accessibility, diversification and women participation. Physical load, posture, repetitive strain, duration, body pain disorders were six variables selected to characterize drudgery of women in each production system. Various agriculture related production systems i.e., paddy, maize, vegetable, flower and spices were selected to characterize drudgery of farm women. Experiments were conducted in five operational villages selected by 11 centre each, following the criteria of accessibility and diversification and to elicit data on drudgery reducing farm technologies for gender equity in respective production system. Among the ten activities that were compared irrespective of production system and location; it was found that harvesting, weeding and land preparation activities were the top three drudgery responsive pre harvest activities and they are the critical operations of all production systems. Spraying and transport of manure remained as neutral where as spreading of manure and sowing were moderately contributing to drudgery. The differential responsive behaviour examined on factors towards drudgery was found to be the reason.

Paddy Production System: The perceived drudgery in performing various activities were accessed on a four point scale i.e. easy, moderately difficult, difficult and very difficult. It was observed that majority of the respondents perceived farm activities either moderately difficult or difficult. Most of the respondents perceived ploughing as very difficult. A sizeable percentage of women found puddling (42.2%) and transplantation (69.6%) as very difficult and uprooting of seedling (76.3%), weeding (82.6%) and threshing (89.3%) as difficult activities. Similar response was from their male counterpart, who perceived puddling (60.7%), uprooting of seedling (85.6%), perceived pudding (60.7%), uprooting of seedling (85.6%), transplantation (72.3%) and weeding (76.4%) were difficult activities. Most of the respondents (78.3%) responded that harvesting was moderately difficult activity.

Women harvesting paddy

The results inferred that irrespective of production system and activities wherein women participated, GBPUAT, Pantnagar; CSKHPKV, Palampur and VNMKV, Parbhani were the three locations endorsing that drudgery was prevailing at a high order. Harvesting, weeding and land preparation activities were the top three drudgery responsive pre-harvest activities for farm women. Spraying and transport of manure remained as neutral whereas spreading of manure and sowing were moderately contributing to drudgery. Among the post-harvest operations, collecting and heaping was 28 times more drudgery responsive while bagging was four times. It showed physical load and posture as drudgery inducing factors to an extent of 9 times more of the normal in postharvest related activities. Time and physical loads were the factors responding to drudgery in packaging operation

Vegetable Production System: Discomfort and drudgery experiences by farm workers under vegetable production system were analyzed and respondents of all the centre under study felt severe discomfort and exhausted while performing most of the activities in vegetable production. Hands were the most involved body part thereby faced the most discomfort level in all the activities ranging from moderately severe to very severe. Maximum hours was spent in hand weeding followed by irrigation and land preparation except at CAU-Tura where ploughing was found to be the activity of high to very high duration. A maximum of three hours is spent in hand weeding followed by two hours a day spent in irrigating the field. Number of man-days a season was maximum for hand weeding. Workload as per time was maximum for hand weeding followed by land preparation. Under vegetable production system higher number of man days (2-9 days) per season per acre was spent on planting of seedlings followed by weeding activity.

Weeding in vegetable production system

Maize Production System: Drudgery experience in maize production depicts weeding as the most drudgery prone activity at PJTSAU-Andhra Pradesh whereas score on rating on feeling of exhaustion psychophysical, posture assumed in work difficulty perception, performance score, frequency of posture change was recorded, respectively for land preparation activity performed by traditional methods at MPUA&T, Rajasthan. Reduction in all the other parameters of sowing, fertilizer application, harvesting, ploughing, threshing, transporting, manure application was recorded when the activity was performed with improved tools.

Sowing ginger

Cleaning ginger and turmeric

Turmeric and Ginger Production System: This study was conducted at VNMKV-Parbhani. Physiological workload of women workers while performing sorting and cleaning activities using improved method in turmeric production system was assessed and a significant decrease was seen in workload (30%) from heavy to moderate. Highly significant decrease was seen in rated perceived exertion with improved method of sorting and cleaning and drying activities. Whereas physiological workload of women workers in ginger production system while performing planting and weeding activities using developed technologies showed reduction in cardiac cost of work by 16 percent and rated perceived exertion was decreased by 13-32 percent in planting and weeding activities. Developed technologies viz. digging tools (Ukari and finger guards) and new khurpi in ginger production system were found successful in increasing pace of work. Time and work study of the selected activities in turmeric production revealed that wooden hand rake used for drying was

significantly superior over existing method resulted in enhancement of output by 10 percent whereas cleaning and sorting performed using mittens enhancement of output was recorded 20 percent.

Field adaptive trials were conducted for testing effectiveness, feasibility and promotion of gender friendly technologies for drudgery mitigation under various production systems. Fifty one improved technologies have been recommended for farm women in 11 production systems which can enhance the production and efficiency in time and energy management, hence, help in reducing the drudgery of farm women. Technology Resource Centre were established in operational villages by 11 AICRP Centre with the help of village level technology committee, where all the technologies related to different agricultural activities were displayed and made available to the farm women for use. The tools were taken by the women on rotation basis for their use as per their requirement. Linkages were developed with various custom hiring centers and other agencies and possibilities of mass multiplication of proven technologies were explored.

2.2.9 Ergonomics for work improvement and gender equity in agro-enterprises

Ergonomic assessment was carried out in different selected agro enterprises such as bamboo weaving, jaggery production, vermicelli and papad making, food processing and preservation, bead making and sericulture as per regional variation for the research work by various centre where the extent of involvement of women was significant. Descriptive-cum-experimental research design was used to collect information from 30 respondents of each enterprise by each centre. Data were collected regarding gender participation, time and activity profile, workstation design, technology used, job satisfaction and MSD faced by workers in various activities involved in agro-enterprise. Majority of the women expressed that they have pain in their upper arm and lower arm followed by neck and shoulder, low back pain, respectively. The tolerance of the pain symptoms was found to be bearable for majority of cases. Most of them experienced moderate body pain in their palm (81.8%), fingers (81.8%) followed by lower body parts (72.7%).

Food Processing Unit: The respondents found of having very high muscle fatigue who were working in food processing activities in Palampur in all body regions i.e. neck, both shoulders, back, both arms/elbow, both wrists/hands/fingers, both legs/knees and both ankles/ feet/toes. It was observed that food processing activities in Palampur had very high health hazards for workers but muscle fatigue experienced by the workers engaged in food processing activities in Pantnagar seems less hazardous over food processing activities in Palampur due to the difference of type, ways and tool used to accomplish the particular activities performed by the workers. The various task investigated which performed by the workers in food processing enterprise for preparation of lemon pickle and its percent shift time. During preparation of lemon pickle, cutting of lemon required maximum shift time (50%) followed by sun drying (10%), mixing ingredients (10%), packaging (10%), washing lemon (10%) and storage (10%). The task of cutting of lemons task was identified as difficult by the workers during the observation which constitute 50 percent of shift time. The following technologies were developed and tested with women who are working in food processing areas.

- **Hand-operated lemon harvester**- Attempt was made to design and develop a hand-operated Assam lemon harvester. The specific design fall out is drudgery and injury free Assam lemon harvesting using an affordable hand operated lemon harvester.
- **Bamboo ladle for parboiling of rice-** Physiological cost of work of farm women is reduced by about 16 percent, postural stress is reduced by about 57 percent, grip fatigue of farm women is reduced by about 56 percent, ease in operation due to comfortable long bamboo handle.

Ginger peeling knife

Bamboo ladle' for parboiling of rice

Hand-operated lemon harvester

❖ **Ginger peeling knife-** A small knife was developed and was ergonomically tested on the workers and then suitable modifications were made like iron blade, copper wire, bamboo stick, small spring.

Sericulture: Workers engaged in sericulture activities were found having high muscle fatigue in neck region, both shoulders and back due to working in the sericulture activities followed by moderate muscle fatigue in both arms/ elbow, both legs/ knees and both ankles/ feet/ toes and low muscle fatigue in both wrists/ hands/ fingers as assessed by Rodgers overall priority matrix.

Pupa Extractor: To reduce the pain and strain in fingers, wrist and hands and doing more work in less time, a wooden "Pupa Extractor" was designed and developed.

Weaving enterprise: Results of study conducted on workers engaged in weaving enterprise in Hyderabad showed that very high muscle fatigue was experienced by the workers and most affected body regions were neck, right shoulder, back, both arms/ elbow and both wrists/ hands/ fingers followed by high muscle fatigue in left shoulder and left ankle/ feet/ toe. Moderate muscle fatigue was seen in body regions i.e. both legs/ knees and right ankle/ feet/ toe due to weaving activities.

Woman in food processing

Pupa extractor

Woman in weaving

Loom was refined to reduce the drudgery owing to beating operation and warps beam preparation; can be used for both cotton and silk weaving and by both males and females. Weaving activity has the highest risk level although it revealed consequences on the body region start from the neck, shoulder, back, right arm/ elbow, right wrist/hands/fingers and right leg/knee. So ''Plank" for fly shuttle weaver was designed. Improved workstation designs using AUTO CAD for standardization of workstation were recommended in the enterprise on the basis of evaluation of associated risk factors at the workplace. Twenty one technologies were developed for reduction of drudgery of women workers in the selected enterprises. Impact assessment was done in terms of adoption rate, technology gains experienced, reduction of drudgery, worker's perception, change in knowledge and awareness about gender friendly technologies, its benefits and usability.

2.2.10 Reproductive health care in agrarian families

Reproductive health covers all aspects of women's health. It is an umbrella concept, consisting of several distinct, yet related issues such as abortion, child birth, sexuality, contraception and maternal mortality. Biological, social, cultural, economic and behavioural factors play an important role in determination of reproductive health. To study the reproductive health care in agrarian families, the data were collected from 3000-3500 women, (both married and unmarried) from the selected operational villages of AICRP on Home Science at eleven centre (300-325 from each centre). They were assessed on four aspects i.e., Socio-economic status, knowledge regarding reproductive health, maternal and child health and psychological wellbeing through administering the suitable tools. It was observed that the respondents from upper high socio-economic status were having good knowledge on reproductive health. The knowledge of women on reproductive health revealed that majority of the centre specially Jorhat, Hisar, Pantnagar, Udaipur, Parbhani and Dharwad were having average knowledge on reproductive health which was enhanced from average to good with 50 percent to 100 percent as an impact of intervention as compared to other centre. Regarding maternal and child health care, the findings indicated that the respondents from majority centre were having poor knowledge.

Table 2.2.2 **Impact of intervention on maternal and child health awareness**

	Pre-post	n	Mean	Std. Deviation	t	P value
Health	1	1525	42.76	9.26	-13.80	0.001**
	2	851	49.18	13.27		
Hygiene	1	1525	13.69	3.36	-14.81	0.001**
	2	851	16.11	4.52		
Nutrition	1	1525	20.60	4.85	-8.03	0.001**
	2	851	22.40	5.93		
Total	1	1525	77.05	16.35	-13.88	0.001**
	2	851	87.69	20.45		

The study found that awareness on health, hygiene, nutrition before the awareness programme was less, which can be inferred from the mean scores. For health dimension mean score before intervention was 42.7 and after intervention the average score increased to 49.2 with t value 13.8 a significant difference found in their knowledge on health. In hygiene dimension the awareness was less with pre score of 13.6 but after intervention the knowledge score of the sample increased to 16.1 with t value 14.8, significant differences found between pre and post intervention at 0.01 level of significance. For nutrition dimension of maternal and health awareness, the pre knowledge mean score found to be 20.5 and post knowledge mean score was 87.6 with t value 8.026 significant difference at 0.01 level was noted. The study concludes that capacity building programmes showed effect on maternal and child health awareness at significant level as the average scores showed improved post intervention at 0.01 level of significance.

A package on "Reproductive health care for psychological wellbeing of married women" was developed. The topics included in the package were, health: physical, psychological and social, menstruation, pregnancy, HIV/AIDS, family welfare, life skills, social change, mate selection, marital adjustments and social problems.

2.2.11 Development of parenting index for rural families

Data were collected from 6428 families (both father and mother) by selecting 185-325 couples from each centre, residing in the operational villages of AICRP on Home Science. For development of Parenting Index for Rural Families (PIRF), the parameters such as, child-parent relationship, home environment, parent temperament, parental competencies and parenting style were assessed.

Parent-Child Relationship: A parent-child relationship (PCR) is one that nurtures the physical, emotional, and social development of the child. It's a unique bond that every child and parent experience, enjoy and nurture. Data revealed that the overall parent -child relationship which indicate that majority of them were having average category of relationship at Jorhat (70.33%), Hisar (77.33%), Palampur (64%), Pantnagar (63.33%), Udaipur(57.66%), Dharwad (54.37%) whereas Tura(63.33%) and Hyderabad (64%) had good relationship in all the areas. A poor category of parent child relationship was reported by the parents belonging to Parbhani (92.33%) and Madurai (24.16%).

Infant temperament: A child's temperament describes the way in which he/she approaches and reacts to the world. It is her/his personal style. Temperament influences the child's behavior and the way he/she interacts with others. It was observed that at majority of the centre that is Jorhat, Hisar, Palampur, Pantnagar, Udaipur, Ludhiana and Dharwad, the temperament found to be more positive with 95.38, 71, 85.19, 78.66, 56.79 and 96.36 percent respectively followed by the category of average at Hyderabad (49%) and Tura(79%). Children from Parbhani and Madurai were having less positive temperament. It can be concluded that though parenting plays a pivotal role in the temperamental aspect of children but certainly there are other responsible reasons also as the data indicates that the mother-child relations were poor at Tura, still the temperament of their children was average positive. It indicates that parents required interventions to enhance desired competencies for improving the temperament of their children in view of social wellbeing.

Home Environment: Home environment has an impact on overall development of the child. Early years are the crucial years for the development of the child and each child needs an experientially rich environment for his/ her optimal development. Human growth and development is a product of genetic and environmental influences. Results related to the Home environment of the subjects clearly represent that majority of the respondents from Jorhat (46.46%), Hyderabad (41%), Hisar (67%), Palampur (88.49%), Pantnagar (49%), Dharwad (63.85) and Tura (91%) were having moderate home environment whereas home environment of Parbhani (93.33%) and Madurai (52.5%) were not conducive. Only Udaipur center had conducive or

supportive home environment for the optimum development of children. By having majority (73.33%) of children in the category of good home environment parents provide the good home environment to their children for better growth and development.

Parent Temperament: Temperament consists of the individual differences in emotion, motor activation and attention reaction to stimuli. Temperament shapes children's outcomes and influences the way they interact with their environment and how adults and children respond to them. Results of overall parental temperament represented that almost all the centers Jorhat (83.83%), Hisar (70.19%), Palampur (65.15%), Pantnagar (54.66%), Udaipur (55.66%) and Tura (52.16%) were falling under the average category. Parents from Hyderbad (32.66%) and Parbhani (96.33%) were having poor temperament. Only parents at Dharwad were having good category of parental temperament.

Parenting Competencies: Parenting competencies refers to the capabilities and efficiencies of the parents related to child rearing which help a child to become as social asset by using his full potentials. The data concluded that various centers were in average category like Hisar (31.66%), Palampur (78.3%), Pantnagar (57.5%), Madurai (19%) and Tura (70.53%). Whereas other centers like Hyderabad (71.89%) and Dharwad (88.21%) were under the category of good parental competencies. Only Parbhani centre was having poor parenting competencies.

Parenting Style: A parenting style is a psychological construct representing standard strategies that parents use in their child rearing. The quality of parenting can be more essential than the quantity of time spent with the child. The data revealed that the entire center parents like Jorhat (83.33%), Hyderabad (44%), Hisar (86.66%), Palampur (94.04%), Udaipur (80%), Parbhani (96.33%), Dharwad (73.18%), Madurai (43.5%) and Tura (85%) parents go down under authoritative parenting style which means parents use reasoning and allow give and take discussion.

Child Assessment: Assessment provides valuable information about each child's interests, strengths, and needs. Screening gives a snapshot of whether the child's development is on track. Assessment is an ongoing process that includes observation and provides information about development over time. The data regarding to child assessment (overall) 3-4 years revealed that all (100%) the children at Jorhat, Ludhiana and Dharwad were found to be independent in performing the given tasks based on their suitability for their age followed by Palampur, Parbhani and Udaipur with 95.14 percent, 56 percent and 53 percent respectively. In case of the children from Pantnagar 72 percent were dependent followed by Hyderabad and Hisar with 56 percent at both the centre.

In the category for child assessment (overall) 4-5 Years, it was observed that all (100%) the children at Jorhat, Ludhiana and Dharwad were found to be independent in performing the given tasks based on their suitability for their age followed by Palampur, Parbhani and Udaipur with 90.29 percent, 50 percent and 61 percent respectively. In case of the children from Pantnagar 59 percent were dependent followed by Hyderabad and Hisar with 38 percent and 40 percent respectively.

The child assessment (overall) 5-6 Years revealed that all (100%) the children at Jorhat, Ludhiana and Dharwad were found to be independent in performing the given tasks based on their suitability for their age followed by Dharwad (96.43%) and Palampur (94.17%). Parbhani and Udaipur with 68 percent and 65 percent respectively. In case of the children from Pantnagar 62 percent were dependent followed by Hisar and Hyderabad with 70 percent and 22 percent.

Effect of parenting practices on developmental outcomes of the children was assessed by using the checklist developed by UNICEF. A mobile app on parenting was developed by UAS, Dharwad Centre. Intervention package on "Effective parenting of young children" was prepared and assessed for its efficacy.

3. EVENTS AND ACTIVITIES

3.1 International Day of Yoga (21 June, 2019)

The Institute celebrated fifth International Day of Yoga on 21 June 2019 in the campus. A yoga session was conducted by yoga expert Mr. Dinabandhu Sarangi, Yoga Meditation Centre, Dumuduma, Bhubaneswar who demonstrated various Yoga Asanas and Pranayamas. All the scientific, technical, administrative and contractual staff of ICAR-CIWA actively participated and performed various yoga asanas. The yoga expert also answered various queries raised by the staff on the benefits of specific asanas and pranayams on physical as well as mental health. A poster and essay competition was organised for the staff of ICAR-CIWA. A health check up programme was arranged at Institute campus for the staff including field staff.

Performing asanas and pranayams

Health check up

3.2 Parthenium Awareness Week (16-22 August, 2019)

The Institute celebrated 14th Parthenium Awareness Week at ICAR-CIWA from 16-22 August, 2019. During this week, uprooting of Parthenium, spraying herbicides, composting of biomass etc. were carried out in the campus and also at off campus. Off campus awareness generation on harmful Parthenium was also organized at Jeerabadi village, Jagannath Prasad Block, Ganjam district.

Inauguration of Parthenium Awarenes Week

Uprooting of Parthenium in ICAR-CIWA

3.3 Mahila Kisan Diwas (15 October, 2019)

Mahila Kisan Diwas was celebrated in the Institute on 15 October, 2019. Dr. P. K. Agarwal, Hon'ble Vice-Chancellor of OUAT, Bhubaneswar graced the occasion as Chief Guest. In his address, he said that farm women play multi-dimensional roles in agriculture and therefore, proper structural, functional and institutional measures are to be promoted to empower women, to build their abilities and to increase their access to input, technology and other agricultural resources. About 200 farm women from different parts of Odisha and also from Valsad, Gujarat participated in the programme. Various competitions such as agricultural quiz and elocution competition on *"Role of Farm Women in Doubling the Farm Income"* were organized. In addition a scientists-farmwomen interface was also organized.

Address by Dr. P. K. Agarwal, VC, OUAT

Prize distribution

3.4 World Food Day (16 October, 2019)

ICAR-CIWA celebrated "World Food Day" on 16 October, 2019 in collaboration with IPE Global Ltd. The theme of the programme was *'Our Actions are Our Future - Healthy Diets for a Zero Hunger World'*. A farmer-scientist interface was organized where in subject matter experts from ICAR-CIWA interacted with farmwomen on different women friendly technologies *viz.,* mushroom cultivation, backyard poultry, dairy farming, goat rearing, vegetable cultivation, seed production, aquaculture etc. and its potential in doubling the farmers' income and thereby reducing hunger. Ten progressive women farmers from Kendujhar district and 30 farmers (men and women) from Bhubaneswar, Khordha district of Odisha, staff members of partner institutions and ICAR-CIWA participated in the programme. The group of progressive women farmers from Kendujhar shared their experience on how they have coped up with climate change and addressed hunger during last one decade.

Inauguration

Experience sharing by progressive women farmers

3.5 Sports Tournament for Eastern Zone (18-22 November, 2019)

A contingent of 16 participants from ICAR-CIWA participated in the ICAR-Tournament for Eastern Zone held at ICAR-NRRI, Cuttack during 18-22 November, 2019. The team led by CDM Dr. Anil Kumar participated in team events like Football, Volley ball shooting and smashing and individual events like 400 meter running, 800 meter running, carrom, shotput, discus and javelin throw, badminton and table tennis etc. During closing ceremony, Shri. J. Biswal, AO, ICAR-CIWA was felicitated.

Participation in Eastern Zone Sports Tournament

3.6 Constitution Day and Citizens' Duties Campaign (26 November, 2019)

ICAR-CIWA observed the Constitution Day & Citizen's Duties Campaign on 26 November, 2019. The Preamble to the Constitution of India was recited and a rally focused on the Citizens' Duties was organised. Awareness on Constitution Day & Citizen's Duties Campaign was organized in Beherasahi village, Satyabadi block, Puri. Forty rural women participated in the programme. A rally focusing on the Fundamental Duties was held with the participation of the rural women in the village.

Rally focusing on the Fundamental Duties

3.7 Agricultural Education Day (3 December, 2019)

ICAR-CIWA, Bhubaneswar observed Agricultural Education Day on 3 December, 2019 at Government Nodal High School, Baramunda, Bhubaneswar. During this occasion, students were encouraged to take up agriculture discipline as a challenging career option and quiz, drawing, debate and display of science model competitions on 'Importance of Agricultural Education: Need of the Hour' and 'Effect of climate change on agriculture' were organized. A total of 650 students and 39 school teachers participated in the programme and more than 300 students participated in various competitions.

Participation of students in Debate competition

Prize distribution to students

3.8 Women in Agriculture Day (4 December, 2019)

ICAR-CIWA, Bhubaneswar observed Women in Agriculture Day at Ali Pingala Village, Chamarpada Panchayat, Nimapada block of Puri district. Farm women were encouraged to take up various income generating activities in agriculture as a challenging option for doubling their income. During this occasion, quiz, rangoli and debate competitions on 'Effect of climate change on agriculture' were organized. A total of 150 farm women participated in the programme. A farmer-scientist interface was organized specially on various technical solutions to dairy farm women and encouraged them for undertaking fodder cultivation. During the programme, various drudgery reducing tools and harvest bag were demonstrated to women farmers.

Rangoli Competition

Demonstration of Harvest Bag

4. REVIEW MEETINGS

4.1 Workshop for Finalization of Research Programmes of AICRP on Home Science and ICAR- CIWA (30-31 August, 2019)

A two-days workshop for finalization of research projects of AICRP on Home Science and Collaborative Research Projects of the Institute was organized at ICAR-CIWA, Bhubaneswar during 30-31 August, 2019. Dr. K. N. Agarwal, Project Coordinator of AICRP on Ergonomics and Safety in Agriculture, ICAR-CIAE, Bhopal participated as an expert and offered valuable inputs for shaping the project proposals. The two-days workshop was graced by the presence of Dr. N. S. Rathore, Hon'ble Vice-Chancellor, MPUAT, Udaipur and Former DDG (Agril. Education), ICAR, New Delhi as the Chief Guest. In his address, Dr. Rathore expressed that out of the 65 AICRPs operating in ICAR, this AICRP on Home Science is unique, and the only project having welfare of women in agriculture as its major thrust area. He advised the scientist to have scholastic approach in their works for empowering women. Scientists from all the 13 AICRP units and ICAR-CIWA participated in the workshop and presented the projects/ collaborative projects in programme mode under five programmes and the projects were finalized for the EFC 2020-25.

Workshop for Finalization of Research Programmes

4.2 19th Institute Research Council Meeting (30 October, 2019)

The 19th Institute Research Council (IRC) Meeting of ICAR-CIWA was held on 30 October, 2019 to review the progress of research projects for the period from April, 2018 to March, 2019, action taken on the proceedings of the 18th IRC Meeting and future course of action. Dr. P. S. Pandey, Hon'ble ADG (EP&HS), ICAR presided over the meeting and advised the scientists to undertake research projects in networking mode with a national perspective to increase the visibility of the Institute. He emphasized the importance of enabling environment in the Institute for continuous progress in research in the area of women in agriculture and suggested to review the progress of each research project on periodic basis by the competent authority of the Institute.

IRC in Progress

Thereafter, the presentations of the research projects including action taken on the suggestions of last IRC were made. This was followed by discussion on each project.

A total of 18 projects, 15 Institute ongoing projects and 3 externally funded projects were discussed. Dr. S. K. Srivastava, Director, ICAR-CIWA and Chairperson in his concluding remarks appreciated the efforts of all the PIs and Co-PIs. He advised the scientists to incorporate all the suggestions in future programmes / plan of action.

4.3 RAC Review of AICRP on Home Science (19 December, 2019)

The ICAR-Central Institute for Women in Agriculture, Bhubaneswar in collaboration with All India Coordinated Research Project on Home Science, PJTSAU Centre, Hyderabad organized the RAC review meeting of AICRP on Home Science at Hyderabad on 19 December, 2019. Dr. V. N. Sharda, RAC Chairman and Former Member, Agricultural Scientists Recruitment Board urged the 13 AICRP-Home Science Centres to work with holistic approach and with a wider perspective by covering 20 agro-ecological regions of the country. He insisted on assessment of all the government programmes at state and central level by the AICRP Centres and have linkages with all the line departments for establishing the national status. He advised for thinking macro and acting micro for the better performance and greater impact. The RAC members also visited the adopted village viz., Tollukatta in Moinabad mandal, Rangareddy district to review the field level works and to directly interact with the women farmers.

RAC members visiting adopted village of AICRP Centre, PJTSAU, Hyderabad

5. EXTENSION PROGRAMMES

5.1 Mera Gaon Mera Gaurav (MGMG)

Under the National programme of Mera Gaon Mera Gaurav, four teams were formed and each team has adopted 5 villages making a total of 20 villages, in different districts across the state. A total of 39 visits were made to the adopted villages and 1552 women farmers were addressed during the visits. Post cyclone FANI, assessment of the damage was done, as most of the villages were affected by the cyclone.

Interface meeting and distribution of kits

Multiple meetings, gosthis, trainings and demonstrations were also organised in the adopted villages in order to learn about their problems and also provide sustainable solution for the same. Entrepreneurship development for women through cluster approach, making women farmers group at village level and development of linkages to various agencies were initiated for enhanced income generation. Various mobile based advisories were disseminated and relevant literature (535 nos.) were provided by the scientific teams under MGMG to assist the farming community in crop management, nursery raising, poultry management, establishment of small poultry units, pest and disease managements, mushroom cultivation and animal health and hygiene. As many as 1446 number of women farmers were benefitted with the supply of small women friendly tools and equipments which included hand sprayer, hand hoe, sickle, trowel, trench hoe (small & big), cutter, hand cultivator and khurpi. Hybrid Napier (Var. CO-4), Kharif vegetable seeds such as amaranthus (Kosala), okra, bitter guard, cucumber, ridge guard, etc. and vegetable seed kits from ICAR-IIVR were also introduced among the farming communities.

Table 5.1.1 Number of Programmes & Participants (MGMG)

S.No.	Programmes	Total number	Participants
1	Visits made	39	1552
2	Gosthis/ interface meets	21	1045
3	Facilitation for new varieties, seeds and technologies	Women friendly tools and implements, IIVR vegetable seed kit, Hybrid Napier, Other seeds and materials	1446
4	Trainings/demonstrations	34	1267
5	Mobile advisories	174	174
6	Literature support	Paddy cultivation, Fish culture, Poultry, Mushroom cultivation, Fodder cultivation	535

Problems: Bull and monkey menace in most of the villages was the leading concern among the farmers. Diseases and pest management remains an issue and deficiency of micro nutrients in the soil was identified. Improper and unscientific keeping of animals and poor knowledge on balanced diet were found to be the major reason for animal health degradation in the adopted villages.

5.2 Scheduled Castes Sub-Plan (SCSP)

Under the Scheduled Castes Sub-Plan (SCSP), the focus was on technology dissemination, capacity building of beneficiaries, input support and technology showcasing through exposure visits for the socio-economic empowerment of women in agriculture. Various interfaces and skill upgradation programmes related to agriculture and allied sectors were carried out to solve the problems faced by the farmwomen and also to equip them with the latest women friendly technologies. During the interfaces, the farmwomen were sensitized on various issues they confront in their day to day work due to their involvement in agricultural and allied activities, especially in the field of vegetable cultivation. Some of their queries and problems were taken up during the interfaces organized and were met through technological interventions.

The activities carried out during 2019 include, capacity building on improved methods of paddy cultivation and varietal replacement, skill upgradation programmes on improved methods of vegetable cultivation, drudgery reducing farm tools and nutri-gardens. With the vision of doubling the income of farm families, the farmwomen from SC families were sensitized on some of the horticultural interventions like round the year vegetable cultivation, scientific management of vegetable crops and off-season vegetable production. As part of the SCSP programmes, inputs like seeds of improved varieties, farm tools and fishing nets were also distributed to the SC women beneficiaries from the project areas and adopted villages under MGMG programme. Much required awareness was created among farmwomen on drudgery and its effect and impact, for which hampers of drudgery reducing farm tools were distributed to them.

Table 5.2.1 Number of Programmes & SC women beneficiaries (SCSP)

Type of Programme	No. of Programmes	No. of SC women beneficiaries
Skill upgradation + Input Distribution	7	297
Input Distribution	5	294
Total	**12**	**591**

The details of the programmes conducted under SCSP scheme are furnished in Table 9.3.

Glimpses of SCSP Programmes- capacity building and input support

5.3 Swachh Bharat Abhiyan

The *Swachha Bharat Abhiyan* was integrated with technology transfer programmes of the Institute in pan India mode through its head quarter and 13 centres of AICRP (HS) to create awareness in adopted villages involving farmwomen and farmers, youth etc. The on-campus cleanliness drives on swachha bharat abhiyan were organized on weekly basis round the year. A nation-wide campaign was launched on 11 September, 2019 for creating awareness on the theme 'Shun the use of single use plastic' by promoting sustainable alternatives and proper disposal of plastic waste. Swachhta Hi Sewa (11 September - 2 October, 2019) programme under Swachh Bharat Mission was integrated with the programmes of the Institute. Altogether 465 participants consisting of farm women, farmers, students, youth actively participated in the programmes (10 nos.) arranged in Institute campus, office buildings, residential areas, experimental plots, orchards and adopted villages under MGMG, ongoing projects and AICRP (HS) centres across the country.

As part of the Swachhta campaign (SAMUCHIT NIPTAAN), a range of events were also organized during Swachhata Hi Sewa celebrations during 3-27 October, 2019. About 615 farmers, especially farm women and a total of 660 staff and students actively participated in the programme in which 40 kg of single use plastic was collected, manually segregated and disposed by contributing 50 hrs of *Shramadan* in 3 districts of Odisha i.e. Jagatsinghpur, Cuttack, Ganjam.

The 'Swachhta Pakhwada 2019' campaign was also observed by ICAR-CIWA during 16-31 December, 2019. The activities carried out during the period of campaign also included cleaning of public places, elocution competition on the theme 'Plastic waste management', 'Swachhta of nearby tourist spot', stock taking on digitization of office records/ e-office implementation, weeding out old records, disposing of old and obsolete furniture & junk materials, generation of wealth from waste, polythene free status, composting of kitchen and home waste materials, promoting clean & green technologies and organic farming practices in kitchen gardens of residential colonies. Off-campus awareness campaigns and lectures on significance of hygiene and sanitation in the adopted villages involving farm women, farmers, school children and rural youth were also organized during the programme.

Human Chain formation during Swachhata Pakhwada

Swachhata Programme in MGMG village

6. राजभाषा

राजभाषा हिंदी ही एक ऐसी भाषा है जिसके माध्यम से वैज्ञानिक उपलब्धियों को जन जन तक पहुँचाने का कार्य सफलतापूर्वक किया जा सकता है | इसी लक्ष्य प्राप्त करने के लिए विज्ञान सम्बंधित विषयों को हिंदी के मध्यम से प्रचार प्रसार करने कि दिशा में उचित भूमिका निभा रहें है | हिंदी को प्रोत्साहित करने कि उद्देश्य से 13 सितम्बर से 27 सितम्बर 2019 तक भा. कृ. अनु. प. - केन्द्रीय कृषिरत महिला संस्थान, भुवनेश्वर में हिंदी पखवाडा का आयोजन किया गया था | हिंदी दिवस की 13 सितम्बर 2019 को शुभारम्भ संस्थान के निदेशक महोदय के द्वारा किया गया था | हिंदी पखवाडा के दौरान हिंदी में निबंध लेखन प्रतियोगिता, कंप्यूटर पर यूनिकोड में टंकण प्रतियोगिता, वाद-विवाद प्रतियोगिता एवं स्वरचित कविता लेखन का आयोजन किया गया था| संस्थान के सभी अधिकारी/ कर्मचारी/ प्रोजैक्ट स्टाफ हिंदी प्रतियोगिताओं में उत्साह के साथ भाग लिए |

हिंदी पखवाडा

संस्थान के निदेशक महोदय के उपस्थिति में दिनांक 27 सितम्बर 2019 को हिंदी पखवाडा समापन दिवस का आयोजन किया गया | जिसमें विजेता को प्रमाण पत्र के साथ पुरस्कृत किया गया| श्रीमती गीता साहा, हिन्दी अधिकारी द्वारा कार्यक्रम को समन्वित किया गया|

हिंदी देश की शान है, एकता की जान है |

7. AWARDS AND RECOGNITION

ICAR-CIWA

- Recognized as 'Best Women Empowerment Institute in Asia Award - 2019' for excellence in agriculture & allied activities in the field of women in agriculture in Asia region (India) by Global Education & Economic Development Forum.
- Certificate of appreciation for proactively implementing ICAR Research Data Management Guidelines and uploading all its publications and Technologies for 2013-18 in KRISHI portal.

भारतीय कृषि अनुसंधान परिषद

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

भा.कृ.अनु.प. में ज्ञान संवर्धन के लिए अनुसंधान आंकड़ों का कोष

ICAR Research Data Repository for Knowledge Management

CERTIFICATE OF APPRECIATION

प्रशंसा पत्र

यह प्रशंसा पत्र भा.कृ.अनु.प.–केन्द्रीय कृषिरत महिला संस्थान, भुवनेश्वर को भा.कृ.अनु.प. अनुसंधानिक आंकड़ों के प्रबंधन दिशानिर्देशों के सक्रिय क्रियान्वयन एवं कृषि पोर्टल में पिछले 6 वर्षों के सभी **प्रकाशन एवं प्रौद्योगिकियां** अपलोड करने में योगदान के लिए प्रदान किया जाता है।

This certificate of appreciation is awarded to **ICAR-Central Institute for Women in Agriculture, Bhubaneswar** for proactively implementing ICAR Research Data Management Guidelines and uploading of all its **Publications and Technologies** for the last 6 years in KRISHI Portal.

(आर. सी. अग्रवाल)
उपमहानिदेशक (कृषि शिक्षा)
(R.C. Agrawal)
DDG (Agricultural Education)

(के. अलगुसुन्दरम)
उपमहानिदेशक (प्राकृतिक संसाधन प्रबंधन)
(K. Alagusundaram)
DDG (Natural Resource Management)

दिनांक : 10 दिसंबर 2019

Date: 10 December 2019

S. K. Srivastava

- Chief Guest & Lead speaker during national seminar on 'Agriculture development in southern Odisha' at Centurian University, Paralakhemundi, Odisha during 26-27 June, 2019.
- Chief Guest during valedictory function of Hindi Week at ICAR-CHES, Bhubaneswar on 21 September, 2019.
- Chief Guest in the valedictory function of model training on 'Climate smart water management in agriculture for enhancing farm profit and sustainability' at ICAR-IIWM, Bhubaneswar on 25 November, 2019.
- Chief Guest of Hindi Diwas at ICAR-CARI, Bhubaneswar on 16 September, 2019.
- Examiner to set a question paper & evaluate answer scripts for the Examination of the M.F.Sc programme first Semester FEX-503 of CIFE Mumbai during 2019.
- Expert of ICAR for the Evaluation of project proposal for the Emeritus Scientist Scheme.
- External examiner for PG thesis viva-voce examination on 3 July, 2019 at OUAT, Bhubaneswar.
- External examiner of Ph.D. comprehensive vive-voce examination of 3 students at Department of Entomology, OUAT, Bhubaneswar.
- Guest of Honour in the Inaugural Session of XI workshop of AICRP on ESA at OUAT, Bhubaneswar on 10 December, 2019.
- Guest of Honour during inauguration of ICAR Eastern Zone Sports Tournament at ICAR-NRRI, Cuttack on 18 November, 2019.
- Honorary Patron of Editorial Board of Journal of Climate Change & World Peace, Mahanadi Vihar, Naya bazaar, Cuttack, Odisha, India.
- Member National Advisory Committee of FFCSWR-2019.
- Regional expert of SAARC meeting held at Kathmandu, Nepal during 9-11 June, 2019.
- Reviewer for International Journal of Agriculture Sciences.

Sabita Mishra

- Member-Expert, Selection Committee for selection of Young Professional-II under SCSP programme at ICAR-CIFA, Bhubaneswar on 31 July, 2019.
- IMC Member during 8th IMC meeting at ICAR-ATARI, Jabalpur on 4 October, 2019.
- Kumudini Sruti Purskar by Bigyan Prachar Samiti, Cuttack on 15 December, 2019.

A. K. Panda

- Nominated by Director General (ICAR) to attend SAARC Regional Conference on STOP STUNTING, improving Young Children's Diets in South Asia during 17-19 September, 2019, at Kathmandu, Nepal.
- Co-Chairman in Technical session-I at National Conference on Livelihood Improvement through Sustainable Livestock Production held at ICAR-CIRC, Meerut during 3-4 November, 2019.
- Second best oral presentation award during National Conference on Livelihood Improvement through Sustainable Livestock Production held at ICAR-CIRC, Meerut during 3-4 November, 2019.
- Jury member for IPSA Dr. P. Kothandaraman Memorial Award-2019.
- Co-Chairman (Feed Additives & Nutraceutical Sessions) during International Conference on Animal Nutrition (INCAN 2019) held in Kolkata during 17-19 December, 2019.
- Member of International advisory Board of The Journal of Poultry Science Japan (International).
- Section editor of the Brazilian Journal of Animal Sciences (International).
- Editor of the Indian Journal of Poultry Sciences (National).
- Member, Editorial Board of Animal Nutrition and Feed Technology (National).
- Member, Editorial Advisory Board of Amity Journal of Agribusiness (AJAB).

Lipi Das

- Received Dr. D. K. Mishra Memorial Award for significant contributions in transfer of technology approaches and extension research promoting rural employability and delivering the best Lecture in ISEE National Seminar-2019 held at SKRAU, Bikaner during 14-16 November, 2019.
- Expert, Extension Council, MPUAT, Udaipur, Rajasthan.
- Expert Member, Steering Committee on Biotechnology based Programme for Societal Development, DBT, Govt. of India, New Delhi.
- Reviewer, ORYZA, Association of Rice Research Workers, Cuttack.
- Advisory Committee Members, Two M.Sc. students of Agri-business Management, OUAT, Bhubaneswar.
- Chairperson, Technical Session-IV during ISEE National Seminar -2019 held at SKRAU, Bikaner during 14-16 November, 2019.
- Technical Expert for ICAR funded CAFT Training Programme at ICAR-IARI, New Delhi.

B. Sahoo

- Second best oral presentation in national conference on 'Livelihood improvement through sustainable livestock production' held at CIRC, Meerut on November 3-4, 2019.
- Co-chairman in poster session of national conference on 'Livelihood improvement through sustainable livestock production' held at CIRC, Meerut on November 3-4, 2019.
- Co-chairman in session 'Ruminant Nutrition and Ecology' during International conference on 'Nutritional strategies for improving farm profitability and clean animal production' held at WBUAFS, Kolkata on 17-19 December, 2019.
- Advisory committee member of one M.Sc. student in Agri-Business Management, OUAT, Bhubaneswar.
- External Examiner for evaluation of theory answer papers for the 2nd Professional Year Examination on course Animal Nutrition paper-II at College of Veterinary Science, OUAT, Bhubaneswar from 7-9 July, 2019.
- Reviewer of Indian Journal of Animal Science, Animal Nutrition Feed Technology, and Agroforestry Systems.

Tanuja S.

- Reviewer of the Journal of the Science of Food and Agriculture and Journal of Ocean, University of China.

Gayatri Moharana

- Reviewer of the journal-The Anthropologist (T-ANTH).

Ankita Sahu

- Best oral presentation for the paper entitled "Participatory action research for doubling the income of tribal farm women of Odisha through small mango orchards" at 2nd International Conference on Recent advances in Agricultural, Environmental and Applied Sciences for global development at Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan, H.P. during 27-29 September, 2019.
- Young Woman Scientist Award-2019 by Agro Environmental Development Society (AEDS), Majhra Ghat, Rampur, Uttar Pradesh.

D. N. Sarangi

- Bharat Ratna Mother Teresa Gold Medal award from Global Economic Progress & Research Association (GEPRA) during 71st National Unit Conference on 'Individual achievements & national development' at Chennai on 21 December, 2019.

8. PUBLICATIONS

8.1 PUBLICATIONS (ICAR-CIWA)

8.1.1 Research Papers

Acharya, S. and Sarangi, D. N. 2019. Yield evaluation of different strains of paddy straw mushroom (*Volvariella Spp.*). *Journal of AgriSearch*, **6**(2): 102-104. (KRISHI URI: 37443)

Argade, S., Sarkar, A., Behera, B. C. and Hemrom, A. C. 2019. Access to agri-production resources and decision making: gender gap in Odisha. *Journal of Global Communication*, **12**(1): 48-54. (KRISHI URI: 24873)

Behera, R. K., Mishra, S. K., Awasthi, H. K., Das, L. and Mondal, B. 2019. A critical study on usefulness of technical interventions through BGREI programme in Odisha. *International Journal of Current Microbiology and Applied Sciences*, **8**(12): 1368-1373. (KRISHI URI: 34146)

Boitai, S. S., Babu, L. K. and Panda, A. K. 2019. Effect of dietary replacement of maize with cassava root meal on production performance, egg quality and serum biochemical parameters of Vanaraja laying hens. *The Pharma Innovation Journal*, **8**(7): 365-368. (KRISHI URI: 26554)

Gumpha, L. K., Babu, L. K., Kumar, A., Samal, P. and Panda, A. K. 2019. Effect of low protein diets on production performance, egg quality and serum biochemical indices of Vanaraja laying hens. *Animal Nutrition and Feed Technology*, **19**(3): 349-359. (KRISHI URI: 37548)

Jeeva, J. C., Gayatri, M., Joshi, K., Behera, B. C. and Subrat K. D. 2019. Gender mainstreaming: A participatory impact assessment of livelihood interventions among the tribal farm families in Odisha, India. *International Journal of Current Microbiology and Applied Sciences,* **8**(7): 2457-2464. (KRISHI URI: 24819).

Jeeva, J. C., Joshi, K., Abha, S and Behera, B.C. 2019. Engendering finger millet based value chains for livelihood and nutritional security of women in agriculture. *Current Science*, **116** (11): 1893-1896. (KRISHI URI: 24314)

Kumar, A., Jeeva, J. C., Sahoo, B., Tanuja, S. and Sarangi, D. N. 2019. Status of women in agriculture in the coastal districts of Odisha. *Journal of the Indian Society of Coastal Agricultural Research*, **37**(1): 76-85. (KRISHI URI: 26259)

Kumar, A., Jeeva, J. C., Sarkar, A., Sahoo, B. and Srivastava, S. K. 2019. Nutritional status of children in the Aspirational Districts of Odisha. *International Journal of Current Microbiology and Applied Sciences*, **8**(12): 1910-1915. (KRISHI URI: 37540)

Lal, G. S., Babu, L. K. and Panda, A. K. 2019. Effect of dietary supplementation of *Azadirachta indica* leaf meal on egg-nutrient profile and production economics of Vanaraja laying hens. *The Pharma Innovation Journal*, **8**(7): 721-725. (KRISHI URI: 26555)

Maity, A., Gaikwad, N., Babu, K. D., More, A. K. and Sarkar, A. 2019. Physico-chemical and nutritional characteristics of main pomegranate (*Punica granatum* L.) cultivars grown in Deccan Plateau of India. *Agrochimica*, **63**(2): 105-121. (KRISHI URI: 37541)

Patra, M., Panda A. K. and Jeeva J. C. 2019. Enhancing rice productivity through women participation. *Green Farming,* **10** (5): 635-638. (KRISHI URI: 26383)

Patra, M., Panda A. K., Jeeva J. C., Mishra, S., Nayak, J. and Sarkar, A. 2019. Feminization of agriculture in India: women development and empowerment. *International Journal of Agriculture Sciences*, **11**(14): 8812-8814. (KRISHI URI: 24874)

Prasad, M. V., Sowjanya, P., Sunder Rao, N., Sarkar, A., Kumar, T., Omkar V., Rajesh, K. and Srikanth, K. 2019. Effectiveness of training programme on oil palm technologies for multipurpose extension officers of State Department of Horticulture, Andhra Pradesh. *Journal of Plantation Crops*, **47**(2): 128-131. (KRISHI URI: 24875)

Sahu, P., Dash, D. K., Lenka, J., Dash, S. N., Tripathi, S. K., Mishra, A. and Sahu, A. 2019. Standardisation of gamma dose in papaya cv. Ranchi Local and Arka Surya. *International Journal of Current Microbiology and Applied Sciences,* **8**(10): 361-373. (KRISHI URI: 34132)

Sahu, P., Dash, D. K., Lenka, J., Dash, S. N., Tripathi, S. K., Mishra, A. and Sahu, A. 2019. Gamma radio sensitivity study on papaya cv. Ranchi Local and Arka Surya. *International Journal of Chemical Studies,* **7**(6): 146-153. (KRISHI URI: 34141)

8.1.2 Popular Articles

Lal, G. S. and Panda, A. K. 2019. Impact of neem leaf meal as a feed supplement in poultry. *Agriculture World*, **8**: 78-81. (KRISHI URI: 37445)

Lal, G. S. and Panda, A. K. 2019. Utilization of neem leaf meal in poultry. *Poultry Line.* **19**(7): 57-59. (KRISHI URI: 37444)

Panda A, K. and Lal, G. S. 2019. *Moringa oleifera*: Its effect on poultry diet. *Poultry Line*, **19**(4): 32-34. (KRISHI URI: 26612)

Srivastava, S. K. 2019. ICAR-CIWA empowering women in agriculture. INFOCUS *Shubh Yatra*, *In flight Magazine of Air India*, June 2019, **7**(6): 79. (KRISHI URI: 37663)

Tanuja, S. 2019. *Machha samrakhyana prastutire satarkata*. *Krushi Jagran*, **3**(10): 54-57. (KRISHI URI: 37661)

Tanuja, S., Moharana, G. and Mhatre, C. S. 2019. *Bhavishyatare apapushtisaha ladiba -parampirika madhurajala chunamachha*. *Krushi Jagran*, **3**(4): 38-40. (KRISHI URI: 37662)

8.1.3 Book/Booklet/Technical Bulletins/ Manual/ Compendium/ Folder/ Leaflet/ Book Chapter

Technical Bulletin

Moharana, G., Panda, R. S., Nayak, J., Mhatre, C. S. and Rout. P. K. 2019. Empowering women farmers through gender friendly farm equipment. Published under Mahindra funded project PRERNA. Technical Bulletin No. 37. ICAR-CIWA, Bhubaneswar, Odisha, pp. 1-42. (KRISHI URI: 37967)

Manual/ Compendium

Das, L., Jeeva, J. C., Moharana, G. and Srivastava, S. K. 2019. Compendium- Promoting technological and economic empowerment of women farmers through gender friendly farming techniques. ICAR- CIWA, Bhubaneswar, Odisha, pp. 1-70. (KRISHI URI: 37547)

Das, L., Sarkar, A. and Moharana, G. 2019. Compendium- ICAR sponsored short course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha, pp. 1-150. (KRISHI URI: 37546)

Folder

Tanuja, S., Sarkar, A., Moharana, G. and Chaitrali S Mhatre. 2019. *Ga pokrire carp machha chasa pranalira sahaja pustika*. ICAR-CIWA, Bhubaneswar, Odisha. (KRISHI URI: 37660)

Chapters in Book/ Compendium/ Souvenir/ Proceedings

Das, L. 2019. Gender mainstreaming in agriculture through value chain: an innovative entrepreneurial approach. Holistic approach for enhancing agricultural growth in changing rural scenario. Indian Society of Extension Education, New Delhi: 67-73. (In Souvenir)

Das, L. 2019. Promoting gender equity in rice farming through processing, value addition and market linkage. Promoting technological and economic empowerment of women farmers through gender friendly farming techniques. ICAR-CIWA, Bhubaneswar: 5-9. (In Compendium)

Das, L. 2019. Promoting gender equity through development of women farmers groups on agriculture value chain. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 84-94. (In Compendium)

Mhatre, C. S., Nayak, J., Moharana, G., Mohanty, G. and Rout, P. K. 2019. Perceived constraints and mitigation in promotion and adoption of women friendly farm tools. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 95-101. (In Compendium)

Moharana, G., Mhatre, C. S. and Panda, R. S. 2019. Identification of drudgery for farm women and their suitable measures. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 56-64. (In Compendium)

Moharana, G., Nayak, J., Mhatre, C. S. and Kishore, P. 2019. *Krsuhirat mahilaon ke khushahaal jindagee ke lie parivaarik sansaadhanon kan kushal prabandhan. Langik anukul krishi taknikiyon ke madhyam se mahila kisanon ki prodyogikiyan avang arthik sasaktikaran*. ICAR-CIWA, Bhubaneswar, Odisha: 31-36. (In Compendium)

Panda, A. K. 2019. *Murgi palan ke madhyam se krushirat mahilaon ka sashaktikaran aur Udyogikaran. Langik anukul krishi taknikiyon ke madhyam se mahila kisanon ki prodyogikiyan avang arthik sasaktikaran*. ICAR-CIWA, Bhubaneswar, Odisha: 49-55. (In Compendium)

Panda, A. K. 2019. Rural poultry production for poverty alleviation and gender equity in India. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 110-118. (In Compendium)

Sahu, A, Das, L. and Samant, D. 2019. Strengthening livelihood security of women farmers through horticultural interventions. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 77-80 (In Compendium)

Sahu, A., Das, L. and Samant, D. 2019. Bagwani mein udyamita vikas hetu Krushirat mahilaon ki shramata nirman. Langik anukul krishi taknikiyon ke madhyam se mahila kisanon ki prodyogikiyan avang arthik sasaktikaran. ICAR-CIWA, Bhubaneswar, Odisha: 1-4. (In Compendium)

Sarkar, A, Das, L. and Moharana, G. 2019. Gender sensitive indicators for sustainable agriculture. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR-CIWA, Bhubaneswar, Odisha: 141-143. (In Compendium)

Srivastava, S. K. 2019. Role of farm women in water conservation and income enhancement. Climate smart water management in agriculture for enhancing farm profit and sustainability. ICAR-Indian Institute of Water Management, Bhubaneswar: 35-41. (In Training Manual)

Tanuja, S. 2019. Issues and opportunities for women in fish processing. Short Course on Gender gaps and interventions to address gender issues in agriculture. ICAR- CIWA, Bhubaneswar, Odisha: 125-127. (In Compendium)

8.1.4 Abstracts/ Presentation in conferences/ seminars/ workshop

Moharana, G., Babu, N., Mhatre, C. S. and Rout. P. K. and Panda, R. S. 2019. Occupational health hazards of Women farmers engaged in Mango and Cashew nut orchards. 17th International Ergonomics Conference on Humanizing Work and Work Envioronment (HWWE-2019). Dr B R Ambedkar NIT Jalandhar, 11-13 November, 2019: 225-226. (Oral Presentation)

Panda, A. K., Sahoo, B. and Kumar, A. 2019. Effect of dietary supplementation of *Moringa Oleifera* leaf meal on production performance and egg quality of *Vanaraja* laying hens. International conference on animal nutrition, Kolkata, December 17-19, 2019: 91. (Oral Presentation).

Panda, A. K., Sahoo, B., Kumar, A. and Sarangi, D. N. 2019. Effect of supplementary feeding on performance of *Vanaraja* growing chicks in extensive system of production. IPSACON, Durg, December 11-13, 2019: 85. (Oral Presentation).

Sahoo, B., Kumar, A., Panda, A. K., Das, L., Maradana, U., Sarangi, D. N. and Srivastava, S. K. 2019. Mineral mixture supplementation in lactating crossbred cows in peri urban dairy farming: an approach to augment productivity and economic empowerment of farm women. National conference on livelihood improvement through sustainable livestock production held at ICAR-CIRC, Meerut on 3-4 Novomber, 2019.

Sahoo, B., Kumar, A., Panda, A. K., Das, L., Sarangi, D. N. and Srivastava, S. K. 2019. Effect of supplementation of minerals on productive and reproductive performance of crossbred cows: a case study on economic empowerment of farm women in peri urban dairy farming, International conference on Nutritional strategies for improving farm profitability and clean animal production held at WBUAFS, Kolkata on 17-19 December, 2019.

Sahu, A., Srivastava, S. K., Jeeva, J. C. and Mhatre, C. S. 2019. Participatory action research for doubling the income of tribal farm women of Odisha through small mango orchard. 2nd International conference on Recent advances in agricultural, environmental and applied sciences for global development. Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan, H. P., September 27-29, 2019: 202. (Oral Presentation)

Tanuja, S., Jeeva, J. C. and Ellojita P. R. 2019. Fish consumption pattern of Indian population. *51st Annual national conference of Nutrition Society of India*. Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, November 7-9, 2019. (Abstract)

8.2 PUBLICATIONS (AICRP ON HOME SCIENCE)

8.2.1 Research Papers

Adiyaman, P. and Hemalatha, G. and Amutha, S. 2019. Regional specific low glycemic foods - natural remedy for diabetes (part-II). *Agribusiness and Food Industry*, **16**(7): 38-41.

Adiyaman, P., Hemalatha, G. and Amutha, S. 2019. Regional specific low glycemic foods - natural remedy for diabetes (part-I). *Agribusiness and Food Industry*, **16**(6): 35-37.

Aggarwal, S., Singla, N. and Bakhetia, P. 2019. Impact of Nutrition Counseling on Dietary Intake of Obese Women from Low, Middle and High Income Group of Hoshiarpur City of Punjab. *International Journal of Food, Nutrition and Dietetics*, **7**(1): 33-40.

Alapati, P. and Shaik, K. S. 2019. Herbal functional finishes on cotton textiles to encounter bacteria and mosquitoes. *International Journal of Chemical Studies*, **7**(6): 505-512.

Alapati, P. and Shaik, K. S. 2019. Natural dye printing with *Eclipta Prostrata* on Cotton. *International Journal of Chemical Studies*, **7**(3): 135-140.

Anand, A., Dhaliwal, Y. S. and Verma, R. 2019. Formulation and quality evaluation of weaning food mixes supplemented with dehydrated apple based on under-utilized crops of Himachal Pradesh. *Journal of Pharmacognosy and Phytochemistry*, **SP5**: 11-16.

Aneja, A. and Malik, P. 2019. Maternal and child health knowledge of rural mothers. *Indian Journal of Health and Wellbeing*, **10**(9): 276-278. (KRISHI URI: 37435)

Babel, B. and Mehta, M. 2019. Awareness generation among women for value addition of post

consumer textile waste. *International Journal of Home Science,* **5**(3): 78-81.

Babel, S. and Sanchiher, L. 2019. Dyeing of *Calotropis procera* fibre with natural dyes and judging its colour fastness. *International Journal of Chemical Studies,* **7**(5): 1937-1939.

Bains, S., Kaur, R. and Sethi, M. 2019. Antimicrobial finish on cotton fabric using Harshingar. *Journal of Pharmacognosy and Phytochemistry,* **1**: 263-267.

Bains, S., Kaur, R. and Sethi, M. 2019. Durrie weaving - resurgence through contemporary use. *Pantnagar Journal of Research*, **17**(2): 161-167.

Bains, S., Kaur, R. and Sethi, M. 2019. Utilization of plant extract as antimicrobial finish for healthcare textiles. *International Journal of Farm Sciences*, **9**(3): 96-100.

Bansal, V. and Joshi, V. 2019. Socio economic profile characteristic of farmers regarding use of ICT tools. *International Journal of Current Microbiology and Applied Sciences*, **8**(7): 164-170.

Batra, A., Sidhu, K. and Sharma, S. 2019. Characteristics of women WhatsApp users and use pattern. *Journal of Education, Society and Behavioural Science*, **28**(4): 1-7.

Choudhary, P., Gupta, R. and Verma, R. 2019. Improvement in physical fitness index, VO2 Max score and haemoglobin level with diet and nutrition intervention. *Applied Biological Research*, **21**(1): 41-48.

Dangi, S. and Bansal, V. 2019. Studying effectiveness of flip book on hygiene during menstruation in terms of gain in knowledge by rural women. *Asian Journal of Home Science*, **14**(1): 39-44.

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9. TRAINING AND CAPACITY BUILDING

9.1 Major Training Programmes organized at ICAR-CIWA

9.1.1 Internship of Students

A three months Internship programme was imparted for 11 students of B. Tech. Agriculture Engineering from Centurion University of Technology and Management, Paralakhemundi, Odisha in Fish Processing Technology (5 students) and Farm Machinery and Power (6 students), from 1 July to 30 September, 2019. In fish processing, the students were given hands-on training on preparation of value added products from fish. They were also trained on the proximate and quality analysis of fish dried using solar rack dryer, hot air oven and direct sun drying. Designing and development of a vegetable cum fish cutting tool and motorised vegetable cum fish descaling/ peeling device was done by the students. Two projects titled "Design and Development of Gender Friendly Walking Type Sprayer" and "Refinement of CIAE Solar Cabinet Dryer" were designed and developed by the students of farm machinery and power. They applied the ergonomics and operational principles to evaluate the developed machinery. The students also benefitted by the hands-on use of advanced ergonomics instrumentation and workshop machinery available at ICAR-CIWA. The students of Fish Processing Technology were guided by Dr. Tanuja S. and Farm Machinery and Power were guided by Er. Chaitrali S. Mhatre.

Internship Students

9.1.2 ICAR sponsored Short Course

ICAR- CIWA organized a ten days ICAR sponsored short course on Gender gaps and interventions to address gender issues in agriculture from 17-26 September, 2019. The programme was attended by 25 participants which included Senior Teaching Faculties and Scientists of ICAR Institutes from 11 different states of the country. During the programme, discussions on various technological and methodological courses in agriculture and allied sectors were taken up in addition to field visits and in-house project formulation. All the lectures and presentations emphasized on strengthening gender perspective in various research and extension. The programme was inaugurated by Dr. Himanshu Pathak, Director, ICAR-NRRI, Cuttack. In his address to the participants, he pointed out on the need of women empowerment especially in the field of agriculture as major challenges such as male migration and climate change remains prominent in near future.

Address by DG, ICAR

Certificate distribution

In its valedictory function, Dr. Trilochan Mohapatra, Hon'ble Secretary, DARE and Director General, ICAR, New Delhi graced the occasion as Chief Guest. He emphasized on how gender equality and equity can be addressed and mitigated at the family and community level by creating awareness among the various stakeholders. While focussing on the gender mainstreaming, he emphasized that mindset change should be the basic strategy for achieving women empowerment in our society and the change should be fundamental instead of cosmic change. He also expressed his concern over upliftment of farm women engaged in farming activities including their nutritional and livelihood security. The short course was coordinated by Dr. Lipi Das, Dr. Ananta Sarkar and Ms. G. Moharana.

9.1.3 Capacity Building Programme on Promoting Technological and Economic Empowerment of Women Farmers through Gender Friendly Farming Techniques

The Institute conducted four days trainers' training programme on ''Promoting technological and economic empowerment of women farmers through gender friendly farming techniques'' sponsored by ATMA, Valsad, Gujarat from 14-17 October, 2019. About 20 progressive farm women along with 4 extension officers of Valsad district participated in this training programme. The training aimed at empowering women farmers both technologically and economically through

Inaugural programme

Prize distribution

gender friendly farming techniques in agriculture and allied sectors. Training module consists of 13 theory classes, 2 practical classes and 2 visits. The training focused on applied and practical methods by using brainstorming sessions, collective interactions, group discussions. Pre and post knowledge evaluation has been conducted through a proper questionnaire. The training programme was coordinated by Dr. Lipi Das, Dr. J. Charles Jeeva and Ms. G. Moharana.

9.2 Training/ Workshop/ Interface/ Exposure Visit/ Field Visit organized by Scientists under different projects

S.No.	Project Name	Programme	Venue	Date	No of stakeholders		
					Women	Men	Total
1	Adding value to fish: a potential livelihood option for rural women of Odisha	Skill training on value added products and by products to master trainers	ICAR-CIWA				
		a. Kanamana village,Astaranga		22 April, 2019	12	-	12
		b. Pentakota village, Puri		25 April, 2019	12	-	12
		c. Balidia village, Astaranga		23 April, 2019	16	-	16
		Skill training on operation of fish descaling device and solar fish dryer to beneficiaries from Kanamana village,Astaranga		2 August, 2019	17	-	17
2	Developing gender sensitive model for doubling farmers' income by addressing gender concerns and technological gaps	Scientists-Farmwomen interface and capacity building programme on improved methods of vegetable cultivation	Nuasahi, Puri	28 September, 2019	45	-	45
		Entrepreneurship development through improved methods of backyard poultry rearing	Nuasahi, Puri	8 November, 2019	50	-	50
		Exposure Visit	ICAR-CIWA	31 December, 2019	50	-	50
3	Drudgery reduction of women involved in fish processing through technological interventions	Training cum Skill Development	ICAR-CIWA	2 August, 2019	25	-	25
4	Empowering women farmers through promotion of gender friendly farm equipment (PRERNA: ICAR-CIWA, Mahindra & Mahindra Ltd and PRADAN collaborative project)	Training on repairing & maintenance of women friendly tools & equipment for paddy cultivation at farmer's field	Suanpal, Dhalabani, Kalikaprasad, Rugudi, Kaleitumba, Badanai, Sunamuhi, Kadadiha, Kaduakhamana villages in Jashipur Block, Mayurbhanj	3-4 October, 2019	120	2	122

S.No.	Project Name	Programme	Venue	Date	No of stakeholders		
					Women	Men	Total
			Chundua, Chupa, Dabuguda, Kadri, Silpada, Kakalpada, Ranitota, Badliput, Ballel, Kamel, Burdiput, Kangrapada, Jalaguda, Ganel villages in Lamtaput, Koraput	19-20 October, 2019	145	5	150
5	Enhancing income of rural women through improved goat rearing	Training cum animal health camp	Jirabadi, Bhanjnagar	25-26 October, 2019	30	17	47
6	Gender sensitization for engendering agriculture through Technology Hub	In-house workshop for development of Institute Technology hub and Gender sensitization micro-Lab	ICAR-CIWA, Bhubaneswar	13 September, 2019	7	7	14
		Training-cum-sensitization of rural people for gender mainstreaming in agriculture	MGMG village -Guapur, Banamalipur	29 November, 2019	40	10	50
7	Gender inclusive homestead aquaculture for enhancing household fish consumption and income	Training on trellis system establishment around homestead ponds for growing climber vegetables	Dubuduba Village, Satyabadi Block	9 April, 2019	10	-	10
8	Improved dairy farming for enhancing income of rural women	Skill based capacity building programme	ICAR-CIWA	4-5 October, 2019	7	8	15
			Bhodala, Cuttack	3 July, 2019	32	12	44
9	Livelihood Improvement of Tribal Farm Women through Secondary Agriculture	Training on value addition of cereals/ millets	Jeerabadi, Jagannath Prasad block of Ganjam	19 August, 2019	42	-	42
10	Optimizing technological intervention with gender perspective in small scale mango orchards	Training cum demonstration on Planting material production of fruit crops	Baskitala, Mayurbhanj, Odisha	30 July, 2019	37	20	57
11	Promoting gender equity through family poultry production	Management of Family Poultry	Chanarapada, Nimapada, Puri, Odisha	29 June, 2019	38	6	44
		Role of supplementary feeding on performance of bird reared in extensive system	Alipingal, Nimapada, Puri Dist, Odisha	4 October, 2019	54	6	60

S.No.	Project Name	Programme	Venue	Date	No of stakeholders		
					Women	Men	Total
12	Mapping livestock and gender and studying the role of institutions in livestock development in Eastern India and Enhancing income of rural women through improved goat rearing	Training cum animal health camp	Khalgaon, Jagatsinghpur	24 October, 2019	15	55	70
13	Status of women in peri-urban dairy farming: mainstreaming their role for enhancing income and productivity.	Improving productivity of dairy animals through scientific management	Khalgaon, Jagatsinghpur	24 October, 2019	20	50	70

9.3 Training/ Workshop/ Interface/ Exposure Visit/ Field Visit organized by ICAR-CIWA

S. No.	Programme	Venue	Date	Organizers	No of stakeholders		
					Women	Men	Total
1	Broad subject matter area (BSMA) for Social Science meeting	BHU,Varanasi & ICAR, New Delhi	10 May, 2019	Lipi Das	20	10	30
2	Skill upgradation programme on improved methods of vegetable cultivation and drudgery reducing farm tools under SCSP	Nuasahi village, Puri	4 June, 2019	Sabita Mishra J. C. Jeeva Ankita Sahu B. C. Behera Subrat K. Das	25	0	25
3	Exposure visit from ICAR-NDRI eastern RS, Kalyani	ICAR-CIWA	27 June, 2019	Anil Kumar B. Sahoo D. N. Sarangi	6	0	6
4	Exposure visit of All India Educational Tour of 3rd Year B. Sc. (Hons.) Agriculture students of B. P. S. Agricultural College, Purnea, Bihar Agricultural University, Sabour, Bhagalpur	ICAR-CIWA, Bhubaneswar	29 June, 2019	G. Moharana M. Prusty	21	24	45
5	Sensitization programme on drudgery reduction and distribution of women friendly farm tool kits under SCSP	Parichanharpada village, Puri	29 June, 2019	A. K. Panda C. S. Mhatre P. K. Rout	16	0	16
6	Skill upgradation programme on improved methods of paddy cultivation and varietal replacement under SCSP	Satyabadi and Nuasahi villages, Puri	15 July, 2019	Sabita Mishra A.K. Panda Jyoti Nayak Ananta Sarkar J. C. Jeeva B. C. Behera Subrat K. Das	100	0	100
7	Distribution of minor farm tools under SCSP	Beherasahi village, Puri	23 July, 2019	Jyoti Nayak Tanuja S. Geeta Saha	49	0	49

S. No.	Programme	Venue	Date	Organizers	No of stakeholders		
					Women	Men	Total
8	Improved methods of vegetable cultivation during *kharif* under SCSP	ICAR-CIWA	27 July, 2019	Anil Kumar Sabita Mishra Ananta Sarkar L. P. Sahoo D. N. Sarangi B. C. Behera	41	0	41
9	Farmwomen-Scientists Interface and skill upgradation programme on drudgery reducing farm tools under SCSP	Balrampur village, Cuttack	7 August, 2019	Lipi Das B. Sahoo J. C. Jeeva G. Moharana S. K. Behera A. C. Hemrom	47	0	47
10	Distribution of vegetable seed kits, planting materials and minor farm tool kits under SCSP	Mahidharpada and Dihasahi villages, Cuttack	7 September, 2019	Anil Kumar Sabita Mishra Ananta Sarkar L. P. Sahoo D. N. Sarangi B. C. Behera U. Maradana	36	0	36
11	ICAR sponsored short course on Gender gaps and interventions to address gender issues in agriculture	ICAR-CIWA, Bhubaneswar	17-26 September, 2019	Lipi Das Ananta Sarkar G. Moharana	21	4	25
12	Farmers'-Scientists Interface on homestead nutri-garden under SCSP	Kharibil village, Cutttack	1 October, 2019	Anil Kumar Sabita Mishra L. P. Sahoo B. C. Behera U. Maradana	28	0	28
13	Distribution of seed kits	Different villages of Nimapara block, Puri	4 October, 2019	A. K. Panda C. S. Mhatre P. K. Rout	140	0	140
14	Training programme on Promoting technological and economic empowerment of women farmers through gender friendly farming techniques	ICAR-CIWA, Bhubaneswar	14-17 October, 2019	Lipi Das J. C. Jeeva G. Moharana	24	0	24
15	Rashtriya mahila kisan diwas	ICAR-CIWA	15 October, 2019	Lipi Das J. C. Jeeva	150	0	150
16	Distribution of fishing nets under SCSP	ICAR-CIWA	11 November, 2019	Tanuja S. J. C. Jeeva	20	0	20
17	Constitution day & citizen's duties campaign	ICAR-CIWA	26 November, 2019	Tanuja S.	25	25	50
18	Scientists farmers interface under SCSP	Majhihara, Balipatana villages, Khurda	29 November, 2019	Anil Kumar Sabita Mishra L. P. Sahoo Ananta Sarkar D. N. Sarangi B. C. Behera U. Maradana	40	0	40

S. No.	Programme	Venue	Date	Organizers	No of stakeholders		
					Women	Men	Total
19	Interaction with farm women (World Soil Day)	Kharibil, Niali	6 December, 2019	Anil Kumar Sabita Mishra L. P. Sahoo D. N. Sarangi M. Prusty U. Maradana	60	10	70
20	Constitution day & citizen's duties campaign and swachhata campaign	Beherasahi, Sakhigopal, Puri	19 December, 2019	Tanuja S. Jyoti Nayak Geeta Saha	40	0	40
21	Distribution of seed kits and tool kits to SC women farmers of MGMG villages under SCSP	Beherasahi village, Puri	19 December, 2019	Jyoti Nayak Tanuja S. Geeta Saha	49	0	49
22	Interaction with farm women	Majhihara, Balipatna	19 December, 2019	Sabita Mishra	60	10	70
23	Kisan diwas	ICAR-CIWA	23 December, 2019	Anil Kumar Sabita Mishra Ananta Sarkar L. P. Sahoo D. N. Sarangi B. C. Behera	100	20	120

9.4 Exhibitions organized during different occasions

S. No.	Occasion	Venue	Date	Organizers
1	Rice (AICRIP) workshop	ICAR-NRRI, Cuttack	31 May -1 June, 2019	Sabita Mishra B. C. Behera
2	10th Krushi Fair 2019	Saradhabali, Puri	21-25 October 2019	A. K. Panda Subrat Das Sanjay Behera
3	4th PAF congress on Increasing aquaculture production in India through synergistic approach between multinational industries, domestic entrepreneurs and aquaculturists	ICAR-CIFA, Bhubaneswar	15-17 November, 2019	Tanuja S. A. C. Hemrom
4	Confluences of rice ecosystem stakeholders for popularizing ICAR technologies in Odisha- Inspire 2.0	ICAR-NRRI, Cuttack	6 December, 2019	J. C. Jeeva Geeta Saha B. C. Behera

9.5 Radio/ TV talks delivered by Scientists

S. No.	Title/ Theme	Radio/ TV talks	Date	Delivered by
1	Scientific mango farming practices for women farmers (in Odia)	AIR, Bhubaneswar	24 July, 2019	Ankita Sahu
2	*Krushi Mahilanka Shrama Janita Samasya O Ehara Samadhan* (in Odia)	AIR, Bhubaneswar	24 July, 2019	G. Moharana
3	*Mahilanka Pain Krushi* (Agriculture for Women) phone-in live programme	DDK, Bhubaneswar	20 December, 2019	Sabita Mishra
4	*Ghara Aganare Kukuda Chasa* (in Odia)	AIR, Cuttack	25 September, 2019	A. K. Panda

10. HUMAN RESOURCE DEVELOPMENT

Human Resource Development being the most important framework in developing the employee's personal and organizational skills, knowledge and abilities, holds a very significant place in improving the productivity, and ultimately, visibility of the Institute. The Institute strives to upgrade the knowledge and skills of the employees through training and capacity building, updating them with the latest development in their respective fields. Various activities including compilation of skill deficiency areas and training needs of all the scientific, technical and administrative staff, preparation of annual training plan (ATP) and its implementation and periodical reporting of HRD activities to the HRM Unit, ICAR were carried out during the period.

Table 10.1 Number of Employees Undergone Trainings during 2019

S. No.	Category	Total No. of Employees	Total No. of employees undergone training
1	Scientist	17	3
2	Technical	12	3
3	Administrative and Finance	8	0
4	SSS	1	0
	Total	**38**	**6**

Table 10.2 Participation of Employees in Training during 2019

S. No.	Training	Venue	Date	Attended by
I. Scientific Cadre				
1	MDP on "Priority Setting, Monitoring and Evaluation (PME) of Agricultural Research Project"	ICAR-NAARM, Hyderabad	18-23 July, 2019	A.K. Panda
2	MDP on ''Impact Assessment of Agricultural and Rural Development Programmes''	IIM, Lucknow	2-6 September, 2019	Anil Kumar
3	Multivariate Data Analysis Using R	ICAR-NAARM, Hyderabad	22-27 November, 2019	Ananta Sarkar
II. Technical Cadre				
4	ICAR Short Course on Gender Gaps and Interventions to Address Gender Issues in Agriculture	ICAR-CIWA, Bhubaneswar	17-26 September, 2019	P. K. Rout A. C. Hemrom U. Maradana

Table 10.3 Participation of Employees in Conference/Workshop/Meeting

S. No.	Programme	Venue	Date	Attended by
1	Brainstorming workshop of AICRP on Home Science	PJTSAU, Hyderabad	29-30 April, 2019	S. K. Srivastava Lipi Das Ananta Sarkar G. Moharana C. S. Mhatre
2	Meeting of Agro Innovate India limited at ICAR-CIFA, Bhubaneswar	ICAR-CIFA, Bhubaneswar	21 May, 2019	A. K. Panda
3	Meeting with National Innovation Foundation (India)	ICAR-CIWA Bhubaneswar	22 May, 2019	A. K. Panda
4	Rice (AICRIP) workshop	ICAR-NRRI, Cuttack	31 May - 1 June, 2019	Sabita Mishra B. C. Behera
5	Midterm review meeting of ICAR Regional Committee-II	ICAR-CIFRI Barrackpore	12 June, 2019	A. K. Panda

S. No.	Programme	Venue	Date	Attended by
6	AICRP monitoring meeting	UAS, Bangalore UAS, Dharwad	19-22 June, 2019	Lipi Das G. Moharana
7	Regional Advisory Committee meeting on ''Impacts of climate change on major crops in Odisha and way forward for sustainable livelihood''	NABARD, Bhubaneswar	25 June, 2019	J. C. Jeeva
8	ICAR-DAC&FW Interface Meeting with Department of Agriculture, Government of Odisha on 'Enhancing the Preparedness for Agricultural Contingencies during Kharif 2019'	Krishi Bhavan, Bhubaneswar	10 July, 2019	J. C. Jeeva
9	Workshop on Restoration strategies for cyclone affected horticultural crops	ICAR-IIHR CHES, Bhubaneswar	25 July, 2019	L. P. Sahoo Ankita Sahu M. Prusty S. K. Behera
10	One day training cum awareness workshop on J-Gate @CeRA for Eastern region	OUAT, Bhubaneswar	9 August, 2019	Tanuja S.
11	CAFT as training expert	ICAR-IARI, New Delhi	18-19 August, 2019	Lipi Das
12	National Seminar on Policy for ecological applications of coir products in Government departments	Hotel Swosti Premium Bhubaneswar	24 August, 2019	A. K. Panda
13	Project finalization meeting of AICRP	ICAR-CIWA, Bhubaneswar	30-31 August, 2019	All Scientists
14	SAARC Regional Conference on Stop stunting, improving young children's diets in South Asia	Kathmandu, Nepal	17-19 September, 2019	A. K. Panda
15	2nd International conference on Recent advances in agricultural, environmental and applied sciences for global development	Dr. Y. S. Parmar University of Horticulture and Forestry, Solan	27-29 September, 2019	Ankita Sahu
16	National conference on Efficient value chain in fisheries and aquaculture	Swosti Premium, Bhubaneswar	28 September, 2019	Tanuja S.
17	International consultation on Promoting nutrition- sensitive approaches	Hotel May Fair, Bhubaneswar	18 October, 2019	Jyoti Nayak
18	National conference on Livelihood improvement through sustainable livestock production	ICAR-CIRC, Meerut	3-4 November 2019	A. K. Panda B. Sahoo
19	Unit meeting of AICRP-nutrition and extension	MPUAT, Udaipur	5-6 November, 2019	Lipi Das G. Moharana
20	17th International Ergonomics Conference on Humanizing Work and Work Envioronment	Dr. B. R. Ambedkar NIT, Jalandhar	9-11 November, 2019	G. Moharana
21	ISEE National seminar-2019 on Holistic approach for enhancing agricultural growth in changing rural scenario	SKRAU, Bikaner	14-16 November, 2019	Lipi Das
22	Extension council meeting	MPUAT, Udaipur	19 November, 2019	Lipi Das
23	Cross-learning workshop for developing a women-led farmer producer company: Opportunities and challenges' organized by IRRI	Krushi Bhawan, Bhubaneswar	21-22 November, 2019	Sabita Mishra
24	EFC meeting	New Delhi	29 November, 2019	Lipi Das
25	Workshop on fruit crop diversification for sustainability and nutritional security	ICAR-IIHR (CHES), Bhubaneswar	29 November, 2019	Tania Seth Ankita Sahu M. Prusty

S. No.	Programme	Venue	Date	Attended by
26	Assessment committee expert	CAU, Samastipur	30 November- 1 December, 2019	Lipi Das
27	Review meeting with NGO, SWAD to review the project sanctioned by IRRI	Sakhigopal, Puri	4 December, 2019	Sabita Mishra
28	Inspire 2.0: Confluences of rice ecosystem stakeholders for popularizing ICAR/SAUs technologies in Odisha	ICAR-NRRI, Cuttack	6 December, 2019	Lipi Das
29	Participatory study on farm ecosystem: Dissemination workshop of research findings	Hotel Presidency, Bhubaneswar	6-7 December, 2019	A. K. Panda
30	IV Workshop of Nodal Officers of ICAR research data repository for knowledge management	NASC, New Delhi	10-11 December, 2019	Ananta Sarkar
31	Annual workshop of AICRP on ESA	CAET, OUAT, Bhubaneswar	10 - 11 December, 2019	Jyoti Nayak C. S. Mhatre
32	XXXVI Annual conference of IPSACON-2019	College of Vety. Sci. & AH, Durg	11-13 December, 2019	A. K. Panda
33	Exposure visit of the museum at Junagarh Agriculture University, Gujarat	JAU, Gujarat	12 December, 2019	Sabita Mishra G. Moharana
34	International conference on Nutritional strategies for improving farm profitability and clean animal production	Kolkata	17-19 December, 2019	A. K. Panda B. Sahoo

11. DISTINGUISHED VISITORS

S. No.	Name & Designation	Date
1	Dr. J. K. Jena, DDG(FS & AS), ICAR, New Delhi	13 May, 2019
2	Dr. N. S. Rathore, Vice Chancellor, MPUAT, Udaipur, Rajasthan	31 August, 2019
3	Dr. T. Mohapatra, Secretary, DARE and Director General, ICAR	26 September, 2019
4	Dr. R. C. Agrawal, DDG (Edn.), ICAR, New Delhi	31 October, 2019
5	Dr. P. S. Pandey, ADG (EP & HS), ICAR, New Delhi	31 October, 2019

12. DIRECTOR'S VISITS

Date	Place	PURPOSE
29-30, April 2019	PJTSAU, Hyderabad	Brainstorming workshop of AICRP on Home Science
22 May, 2019	NIF-India, Gujarat	Meeting with Dr. Smita Kaul Sharma , NIF-India, Gujarat
31 May, 2019	ICAR-NRRI, Cuttack	54th Annual AICRP meeting and Rice Workshop
9-11 June, 2019	Kathmandu, Nepal	SAARC Regional Expert Meeting (Regional Expert)
26-27 June, 2019	Centurion University, Paralakhemundi	National Seminar on Agriculture Development in Southern Odisha (Chief Guest & Lead Speaker)
16 July, 2019	ICAR-NASC, New Delhi	➢ 91ST Foundation Day of ICAR & Award Ceremony ➢ Interaction programme with Padma Sri awarded farmers
17 July, 2019	ICAR-NASC, New Delhi	SMD level meeting Chaired by the respective DDGs
16 August, 2019	Sri Sri University, Cuttack	Board of Studies Meeting (Member)
1 November, 2019	KAB-II,PUSA, New Delhi	Review meeting under the Chairmanship of DDG (Ag.Edn) to discuss EFC
1 November, 2019	NASC, New Delhi	AICRP Review meeting under the Chairmanship of DG, ICAR
29 November, 2019	Pusa, New Delhi	Meeting to discuss EFC under the Chairmanship of Dr. R.C Agrawal, DDG (Ag.Edn.)
30 November, 2019	Gandhinagar, Gujarat	Dr. A. P. J. Abdul Kalam IGNITE Award function
19 December, 2019	PJTSAU, Hyderabad	Review meeting of AICRP centre by RAC Members

13. RESEARCH PROJECTS

S. No.	Institute Projects	Duration	PI & Co-PIs
1	Livelihood of rural women in different agro-climatic regions with different levels of participation in agriculture and allied sectors `	2019-20	Dr. Anil Kumar Dr. J. C. Jeeva Dr. Ananta Sarkar
2	Designing and development of a Gender Sensitive Agri-nutri (GSAN) farming system model	2019-22	Dr. Lipi Das Dr. S. K. Srivastava Dr. Biswanth Sahoo Dr. Praveen Jakhar Dr. Tania Seth Dr. Sachidananda Swain
3	Engendering agricultural research and extension through gender friendly technology hub	2017-20	Dr. Sabita Mishra Dr. Ananta Sarkar Dr. Laxmi Priya Sahoo Ms. Gayatri Moharana
4	Developing gender sensitive model for Doubling Farmers' Income by addressing gender concerns and technological gaps	2017-20	Dr. J. C. Jeeva Dr. S. K. Srivastava Dr. Anil Kumar Dr. Sabita Mishra Dr. A. K. Panda Dr. Jyoti Nayak Dr. Tanuja S. Mrs. Ankita Sahu
5	Strengthening gender knowledge system in Agriculture	2017-20	Dr. Ananta Sarkar Dr. J. C. Jeeva Dr. Jyoti Nayak Dr. Sabita Mishra
6	Optimizing technological interventions with gender perspective in small scale mango orchards	2017-20	Mrs. Ankita Sahu Dr. S. K. Srivastava Dr. J. C. Jeeva Mrs. Chaitrali S. Mhatre
7	Drudgery reduction of women involved in Fish Processing through technological interventions	2017-20	Dr. Jyoti Nayak Dr. Tanuja S. Mrs. Chaitrali S. Mhatre
8	Livelihood improvement of tribal farm women through secondary agriculture	2017-20	Ms. Gayatri Moharana Dr. Jyoti Nayak Mrs. Ankita Sahu Dr. Lipi Das
9	Design and development of disc type ridger for farmwomen	2017-20	Mrs. Chaitrali S. Mhatre Ms. Gayatri Moharana
10	Development and evaluation of Integrated Floating Cage Aquageoponics System for small scale women pond holders	2017-19	Mrs. Chaitrali S. Mhatre Dr. Tanuja S. Mrs. Ankita Sahu
11	Mapping livestock and gender and studying the role of institutions in livestock development in Eastern India	2017-20	Dr. Anil Kumar Dr. Biswanath Sahoo Dr. Tanuja S.
12	Status of women in peri-urban dairy farming: Mainstreaming their role for enhancing income and productivity	2017-20	Dr. Biswanath Sahoo Dr. Anil Kumar Dr. A. K. Panda Dr. Lipi Das

S. No.	Institute Projects	Duration	PI & Co-PIs
13	Gender inclusive homestead aquaculture for enhancing household fish consumption and income	2017-20	Dr. Tanuja S. Ms. Gayatri Moharana Mrs. Chaitrali S. Mhatre Dr. Ananta Sarkar
14	Promoting gender equity through family poultry production	2016-20	Dr. A. K. Panda Dr. Biswanath Sahoo
15	Enhancing income of rural women through improved goat rearing	2016-20	Dr. Biswanth Sahoo Dr. Anil Kumar Dr. A. K. Panda Dr. Sabita Mishra Dr. Jyoti Nayak
16	Improving availability of quality pulse seed with participation of women	2016- 19	Dr. L. P. Sahoo Dr. S. K. Srivastava Mrs. Chaitrali S. Mhatre Mrs. Ankita Sahu
17	Exploratory study on nutritional status of Nabarangpur district of Odisha (Inter Institutional Project with Regional Station CTCRI, Bhubaneswar)	2016-19	Dr. S. K. Srivastava Dr. Ananta Sarkar Ms. Gayatri Moharana

S.No.	Externally Funded Projects	Duration	PI & Co-PIs
1	Increased productivity of rice based cropping systems and farmers income in Odisha (IRRI-CIWA collaborative project)	2017-20	Dr. A. K. Panda Dr. J. C. Jeeva Dr. Sabita Mishra Dr. Jyoti Nayak Dr. Ananta Sarkar
2	Empowering women farmers through promotion of gender friendly farm equipment (PRERNA: ICAR-CIWA, Mahindra & Mahindra Ltd. and PRADAN collaborative project)	2017- 19	Ms. Gayatri Moharana Dr. Jyoti Nayak Mrs. Chaitrali S. Mhatre
3	Adding value to fish: a potential livelihood option for rural women of Odisha (DSIR funded)	2018-20	Dr. Tanuja S. Dr. J. C. Jeeva
4	Development of gender sensitive entrepreneurship model through Institute- Industry-Stakeholders linkages in convergence mode (ICAR funded)	2019-20	Dr. Lipi Das Dr. S. K. Srivastava Dr. Biswanath Sahoo Ms. Gayatri Moharana Mrs. Ankita Sahu
5	Current approaches of ATMA and KVK in addressing gender issues in agriculture (Emeritus scientist project)	2017-20	Dr. B. N. Sadangi
6	AICRP for Ergonomics and Safety in Agriculture (ESA)	2017-20	Mrs. Chaitrali S. Mhatre Dr. Jyoti Nayak
7	Women empowerment and gender sensitization-Developing a model for bridging gender gap (NASF)	2019-22	Dr. Lipi Das Ms. Gayatri Moharana Mrs. Ankita Sahu Dr. S. K. Srivastava
8	AICRP on Home Science	2017-20	Dr. S. K. Srivastava (PC) Dr. Lipi Das (SIC)

14. PERSONNEL

14.1 Details of Staff (ICAR-CIWA)

S.No	Name	Designation
1	Dr. S. K. Srivastava	Principal Scientist & Director (Acting)
2	Dr. Anil Kumar	Principal Scientist
3	Dr. Sabita Mishra	Principal Scientist
4	Dr. Arun Kumar Panda	Principal Scientist
5	Dr. Lipi Das	Principal Scientist
6	Dr. Biswanath Sahoo	Principal Scientist
7	Dr. Jyoti Nayak	Principal Scientist
8	Dr. J. Charles Jeeva	Principal Scientist
9	Dr. Ananta Sarkar	Senior Scientist
10	Dr. Laxmipriya Sahoo	Senior Scientist
11	Dr. Praveen Jakhar	Senior Scientist
12	Dr. Sachidananda Swain	Scientist
13	Dr. Tanuja S.	Scientist
14	Ms. Gayatri Moharana	Scientist
15	Dr. Tania Seth	Scientist
16	Er. Chaitrali S. Mhatre	Scientist
17	Mrs. Ankita Sahu	Scientist
18	Sh. Shaji A.	Assistant Chief Technical Officer
19	Mrs. Geeta Saha	Technical Officer
20	Sh. Debendra Nath Sarangi	Technical Officer
21	Sh. Manoranja Prusty	Technical Officer
22	Sh.Bhikari Charan Behera	Technical Officer
23	Sh. Bishnu Charan Sahu	Technical Officer
24	Mrs. Tapaswini Sahoo	Senior Technical Assistant
25	Sh. Sanjay Kumar Behera	Senior Technical Assistant
26	Er. Pragati Kishore Rout	Senior Technical Assistant
27	Er. Subrat Kumar Das	Senior Technical Assistant
28	Sh. Atul Chetan Hemrom	Senior Technical Assistant
29	Mrs. Usharani Maradana	Technical Assistant
30	Sh. Jairam Biswal	Administrative Officer
31	Sh. Janardan Biswal	Assistant Finance & Accounts Officer
32	Mrs. Parisima Sen	Private Secretary
33	Mrs. Bishnupriya Moharana	Assistant Administrative Officer
34	Sh. Parikshit Mallik	Stenographer Gr. III
35	Sh. Jyoti Ranjan Das	Upper Division Clerk
36	Sh. Tushar Ranjan Mangaraj	Lower Division Clerk
37	Sh. Pramod Kumar Sahoo	Lower Division Clerk
38	Sh. Biswanath Biswal	Skilled Support Staff

14.2 Appointments/Joining (ICAR-CIWA)

Sl. No	Name	Designation	Date	Details
1	Dr. Tania Seth	Scientist	26 November, 2019	On transfer
2	Dr. Praveen Jakhar	Senior Scientist	30 November, 2019	On transfer
3	Dr. Sachidananda Swain	Scientist	18 December, 2019	On transfer

14.3 Promotions (ICAR-CIWA)

Sl. No	Name	Promoted to the post
1	Sh. Shaji A.	Assistant Chief Technical Officer (T-7-8)
2	Sh. Bishnu Charan Sahu	Technical Officer (T-5)
3	Mrs. Tapaswini Sahoo	Senior Technical Assistant (T-4)
4	Sh. Sanjay Kumar Behera	Senior Technical Assistant (T-4)
5	Sh. Pragati Kishore Rout	Senior Technical Assistant (T-4)
6	Sh. Subrat Kumar Das	Senior Technical Assistant (T-4)
7	Sh. Atul Chetan Hemrom	Senior Technical Assistant (T-4)

14.4 Details of Scientific Staff (AICRP on Home Science)

SN	Name	Component	Designation
	Centre: AAU, Jorhat		
1	Dr. Nabaneeta Gogoi	CT	Principal Scientist
2	Dr. Jinamoni Saikia	HDFS	Principal Scientist
3	Dr. N. Bhattacharyya	FRM	Principal Scientist
4	Dr. Mamoni Das	FN	Principal Scientist & UC
5	Mrs. Mayuri Bora	Ext.	Junior Scientist
	Centre: CAU, Tura		
6	Dr. Puspita Das	Ext.	Professor & UC
7	Dr. Swapnali Borah	FRM	Professor
8	Dr. Kh. R. Aimol	HDFS	Associate Professor
9	Dr. Namita Singh	FN	Associate Professor
10	Dr. Anuapama Mishra	CT	Associate Professor
	Centre: CCSHAU, Hisar		
11	Dr. Kanta Sabharwal	Ext.	Assistant Scientist & UC
12	Dr. Saroj Yadav	CT	Assistant Professor
13	Dr. Poonam Malik	HDFS	Assistant Professor
14	Dr. Urvashi Nandal	FN	Assistant Professor
15	Dr. Promila K. Chahal	FRM	Assistant Scientist
	Centre: CSKHPKV, Palampur		
16	Dr. Sapna Gautam	CT	Senior Scientist & UC
17	Dr. Raj Pathania	HDFS	Senior Scientist
18	Dr. Neena Vyas	FRM	Senior Scientist
19	Dr. Ranjana Verma	FN	Senior Scientist
20	Dr. Bindia Dutt	Ext.	Scientist

SN	Name	Component	Designation
	Centre: PAU, Ludhiana		
37	Dr. Sumeet Grewal	CT	Scientist
38	Ms. Rajdeep Kaur	CT	Scientist
39	Dr. Kiranjot Sidhu	Ext.	Principal Scientist
40	Dr. Ritu Gupta	FRM	Senior Scientist
41	Dr. Neerja Singla	FN	Senior Scientist
42	Mrs. Poonam Bakhetia	FN	Nutritionist
43	Dr. Vandana Kanwar	HDFS	Scientist & UC
44	Dr. Prachi Bisht	HDFS	Scientist
	Centre: PJTSAU, Hyderabad		
45	Dr. V. Vijaya Lakshmi	FRM	Principal Scientist & UC
46	Dr. R. Neelarani	Ext.	Principal Scientist
47	Dr. T. Kamalaja	FN	Senior Scientist
48	Ms. S. L. Pooja	CT	Scientist
49	Ms. Kavitha Kiran	HDFS	Scientist
	Centre: RPCAU, Pusa, Samastipur		
50	Dr. Arunima Kumari	Ext.	Professor & UC
51	Dr. Gitanjali	FN	Assistant Professor
	Centre: TNAU, Madurai		
52	Dr. G. Hemalatha	FN	Senior Scientist &UC
53	Dr. P. Santhi	CT	Senior Scientist
54	Dr. P. Parimalam	FRM	Senior Scientist
55	Dr. J. Jane Sujatha	Ext.	Senior Scientist
56	Dr. G. Sashidevi	HDFS	Senior Scientist

SN	Name	Component	Designation
	Centre: GBPUA&T, Pantnagar		
21	Dr. Deepa Vinay	FRM	Professor, UC & TC
22	Dr. Rita S. Raghu-vanshi	FN	Dean
23	Mrs. Pushpa Shukla	FN	JRO
24	Dr. Manisha Gahlot	CT	Professor
25	Dr. Seema Kwatra	FRM	Professor
26	Dr. Ritu Singh	HDFS	Assistant Professor
27	Dr. Anuradha Dutta	FN	Professor
28	Dr. Anil Kumar	FT	JRO
29	Dr. Pooja Tamta	Ext.	Assistant Professor
	Centre: MPUAT, Udaipur		
30	Dr. Sudha Babel	CT	Professor & UC
31	Dr. Vishakha Bansal	Ext.	Professor & TC
33	Dr. Gaytri Tiwari	HDFS	Senior Scientist & TC
34	Dr. Hemu Rathore	FRM	Senior Scientist
35	Dr. Vishakha Singh	FN	Junior Scientist
36	Dr. Sumitra Meena	FN	Junior Scientist

SN	Name	Component	Designation
	Centre: UAS, Bangalore		
57	Dr. K. Geetha	FN	Senior Scientist, UC & TC
58	Dr. Geetha M. Yank-anchi	FN	Junior Scientist
	Centre: UAS, Dharwad		
59	Dr. Geeta Chittagubbi	FRM	Senior Scientist & UC
60	Dr. Sannapapamma K. J.	CT	Senior Scientist
61	Dr. Geeta Channal	Ext.	Senior Scientist
62	Dr. Manjula Patil	HDFS	Junior Scientist
63	Dr. Rajeshwari Desai	FRM	Junior Scientist
64	Dr. Jyoti Vastrad	CT	Professor &TC
	Centre: VNMKV, Parbhani		
65	Dr. Tasneem N. Khan	FN	Professor & UC
66	Dr. Sunita N. Kale	CT	Professor
67	Ms. Neeta B. Gaikwad	HDFS	Senior Scientist
68	Dr. Jayashree R. Rodge	FRM	Senior Scientist
69	Dr. Shankar G. Puri	Ext.	Senior Scientist

Abbreviation:

FRM	Family Resource Management
FN	Food Science & Nutrition
CT	Clothing and Textile
HDFS	Human Development and Family studies
Ext.	Extension
FT	Food Technology

भा.कृ.अनु.प. - केन्द्रीय कृषिरत महिला संस्थान
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