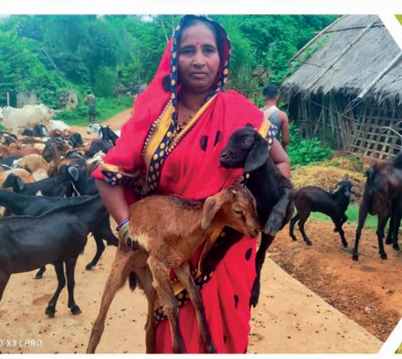
वार्षिक प्रतिवेदन
Annual Report
2020

25 YEARS OF ICAR CENTRAL INSTITUTE FOR WOMEN IN AGRICULTURE
★ 1996-2020 ★




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

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Annual Report
2020

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

ICAR-CIWA

ANNUAL REPORT 2020

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Cover page theme:

The indomitable spirit of farmwomen during COVID-19 in diversified agricultural activities.

ICAR CIWA Impact in Numbers in 2020

52 HRD programmes participation

Unique Institute in India for women in Agriculture

16 MGMG Villages

13 AICRP (HS) Centers

33 NAAS rated Research papers

37 SC women clusters benefited (SCSP)

Best Asian Institute for Women in Agriculture

20 Webinars organized

1135 Women's Participation

43 Mobile Based Advisories

8 awards to scientists

2 Women FPO

OBJECTIVE

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

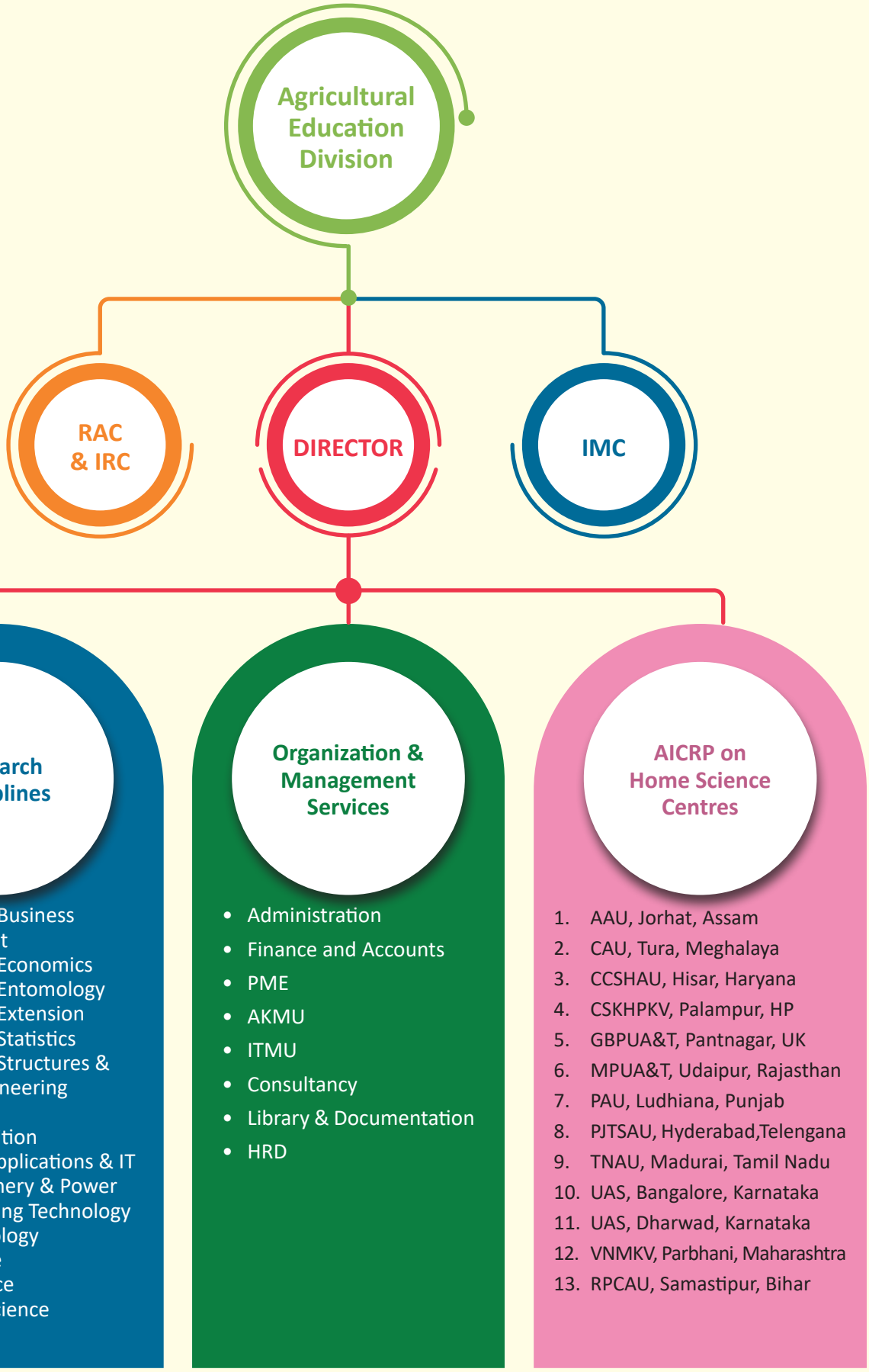
OBJECTIVES

1. Undertake studies to assess agricultural technologies, programmes, institutions and policies to refine these with a gender perspective
2. 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
3. Characterize and understand drudgery and safety related issues of farmwomen and improve their work efficiency
4. Develop gender sensitive, resilient and sustainable agricultural models and institutional innovations for nutrition and livelihood security
5. Documentation and knowledge management of gender studies in agriculture
6. Capacity building of various stakeholders to address gender issues in agriculture


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
Thrust Areas

CONTENTS

ORGANOGRAM


Agricultural Education Division
RAC & IRC
DIRECTOR
IMC
Research Disciplines
Agricultural Business Management
Agricultural Economics
Agricultural Entomology
Agricultural Extension
Agricultural Statistics
Agricultural Structures & Process Engineering
Agronomy
Animal Nutrition
Computer Applications & IT
Farm Machinery & Power
Fish Processing Technology
Food Technology
Fruit Science
Home Science
Vegetable Science
Organization & Management Services
Administration
Finance and Accounts
PME
AKMU
ITMU
Consultancy
Library & Documentation
HRD
AICRP on Home Science Centres
1. AAU, Jorhat, Assam
2. CAU, Tura, Meghalaya
3. CCSHAU, Hisar, Haryana
4. CSKHPKV, Palampur, HP
5. GBPUA&T, Pantnagar, UK
6. MPUA&T, Udaipur, Rajasthan
7. PAU, Ludhiana, Punjab
8. PJTSAU, Hyderabad,Telengana
9. TNAU, Madurai, Tamil Nadu
10. UAS, Bangalore, Karnataka
11. UAS, Dharwad, Karnataka
12. VNMKV, Parbhani, Maharashtra
13. RPCAU, Samastipur, Bihar

PREFACE

Women are an important stakeholder in the agricultural sector. They are engaged in a large number of agricultural operations, many of which do not fall under the definition of 'worker'. Thus the women's participation in agriculture as 'worker' is low and their actual contribution is undervalued. There is need to recognize the participation and contribution of women in agriculture and allied sectors, identify the constraints they face to realize the human potential they have on the path to their economic empowerment. Mainstreaming and empowering women in agriculture will contribute maximum to the Sustainable Development Goal (SDG 5) "to achieve gender equality and the empowerment of all women and girls". The institute since its inception has been working to mainstream and empower women in agriculture through its research, capacity building and advocacy.

Gender disaggregated data in key areas of farm women's socio-economic sector are critical for effective planning of gender based strategies for inclusive agriculture. As an ongoing effort, gender knowledge system portal has been enriched with new datasets and information. A three-tier approach for 'Gender Sensitive Agri-Horti Cropping System Model' was developed for livelihood improvement, nutritional security and entrepreneurship development. Under the ICAR-CIWA-IRRI collaborative project a Women Farmer Producer Company named "Chitri Dora" was formed with the help NGO partner 'PRAGATI' at Koraput involving 1031 tribal women farmer. It included 30 Producer Groups for collective marketing of aromatic rice. Market linkage has been established with Mission Shakti, Odisha for marketing of produce through digital technologies like e-banking, e-commerce and social media. Entrepreneurship development among rural women has been taken up through poultry, goatry and fisheries enterprises. Interventions for drudgery reduction of farm women have also been taken up under various projects.

The All India Coordinated Research Project on Women in Agriculture is being implemented at 13 centres in 12 states in the country to study the regional issues related to women in agriculture and finding solutions for them. Under AICRP on Ergonomics and Safety in Agriculture the contribution of women in agricultural activities is being mapped taking district as a unit.

The research findings of the Institute have been documented in 33 research papers, 18 popular articles, 2 technical bulletin, 3 compendiums and one folder. During the period 19 seminar/ webinars and talks were organised on diverse topics on gender issues in agriculture. The scientist and technical staff of the institute participated in more than 50 national and international webinars during the pandemic year. Twenty three training programme in physical as well as virtual mode were organized during the year. The Institute was conferred the best Asian institute for women in agriculture. The flagship programmes like, Mera Gaon Mera Gaurav (MGMG), Swachh Bharat Mission, Scheduled Caste Sub-Plan (SCSP) etc. were implemented creating to create awareness and economic empowerment of farmers.

I wish to place on record my sincere gratitude to the members and Chairman of RAC for their valuable inputs towards reorienting the research activities of the institute. Dr. R.C. Agarwal, DDG (Agricultural Education) and Dr. P.S. Pandey ADG (EP&HS) has been constant source of inspiration and guide to us on a regular basis. I also thank Dr T. Mohapatra, Director General, ICAR and Secretary, DARE for giving us the valuable insight to work on intersectionality in defining gender inequality and providing all facilities and budget for carrying out the research, extension and other development programmes of the Institute. The editorial team deserves appreciation for synthesizing the Annual Report in a timely manner. I believe this report will be useful to all stakeholders in furthering the cause of creating a just society for women in agriculture.

(Anil Kumar)

कार्यकारी सारांश

भाकृअनुप-केंद्रीय कृषिरत महिला संस्थान, भुवनेश्वर कृषि में महिलाओं से संबंधित विविध पहलुओं पर अनुसंधान कार्यक्रम चलाता है। विभिन्न अनुसंधान और विस्तार आधारित गतिविधियों को आंतरिक, अंतर-संस्थागत, नेटवर्क या सहयोगी अनुसंधान संस्थानों के माध्यम से समन्वित तरीकों के द्वारा निष्पादित किया जाता है। २०२० के दौरान, संस्थान ने कृषि महिला पोषण सुरक्षा, आजीविका वृद्धि, तकनीकी सशक्तिकरण, कठिन परिश्रम में कमी और उद्यमिता विकास पर ध्यान केंद्रित करते हुए २१ शोध परियोजनाओं, ४ बाहरी वित्त पोषित परियोजनाओं, कृषि में श्रमदक्षता और सुरक्षा, AICRP (ESA) और गृह विज्ञान पर AICRP को क्रियान्वित किया। कार्यकारी सारांश में अनुसंधान, विस्तार और प्रौद्योगिकी हस्तांतरण गतिविधियों की प्रमुख उपलब्धियों को संक्षेप में प्रस्तुत किया गया है। कृषि में महिलाओं की भागीदारी के विविध रूप हैं। कृषि महिलाओं का क्षेत्रीय योगदान इंगित करता है कि जनसंख्या के २८ प्रतिशत के रूप में सबसे अधिक महिला कृषि श्रमिक कृषि जलवायु क्षेत्र ७ और १४ में थीं। कुल पांच कृषि जलवायु क्षेत्र (७, ८, ९, १०, १४) में अधिक थी। इसी प्रकार, जनसंख्या के प्रतिशत के रूप में महिला कृषक पश्चिमी शुष्क क्षेत्र (कृषि जलवायु क्षेत्र १४) में सबसे अधिक (२२.८) और उसके बाद पश्चिमी हिमालयी क्षेत्र (१७.४) में थी। प्रौद्योगिकी आंकड़ा को बनाए रखने की पहल के तहत महिलाओं के लिए काम करने वाले लिंग विशेषज्ञों (५०) के साथ-साथ संस्थानों (३१) की भी सूची बनाई गई है। प्रशिक्षण कार्यक्रम का प्रभाव मूल्यांकन 160 विस्तार कार्यकर्ताओं के कौशल और दृष्टिकोण में परिवर्तन जानने के लिए किया गया था। महिलाओं की जरूरतों को समझने (१४६ %) में सबसे अधिक सुधार पाया गया, इसके बाद तालमेल निर्माण (१३१ %), महिलाओं के आर्थिक जीवन को समझना (१३१ %), संचार (५५.३३%) और महिलाओं की कृषि प्रणाली की गतिविधियों को समझना (४४.४४%) था। पूर्व-प्रशिक्षण पर कौशल में औसत सुधार १०१.४% था, जबकि प्रशिक्षण के पहले और बाद के मामले में यह क्रमशः ४९% और ९२% था। लिंग आधारित रणनीतियों की प्रभावी योजना बनाने के लिए उनकी सामाजिक-आर्थिक भागीदारी के प्रमुख क्षेत्रों में विश्वसनीय लिंग आधारित आंकड़ा महत्वपूर्ण हैं। कृषि पोर्टल में वर्तमान जीकेएस में प्रौद्योगिकियों, संसाधन सामग्री (प्रकाशन जैसे प्रशिक्षण नियमावली, तकनीकी बुलेटिन, लिंग नोट/नीति संक्षेप आदि), राष्ट्रीय योजनाओं और कृषि में महिलाओं के लिए विशेष रूप से कार्यक्रम, महिलाओं से संबंधित सूचना और सांख्यिकी से संबंधित जानकारी शामिल है। कृषि, लिंग और संबंधित संकेतकों पर जानकारी, कृषि में लिंग पर पुस्तकें, पत्रिकाएं और कृषि संबंधी आंकड़ों में लिंग समिलित किया है । कृषि पोर्टल (http://www.icar-ciwa.org.in/gks) में लिंग ज्ञान प्रणाली (GKS) को कृषक महिलाओं पर हाल के प्रकाशनों, सूचना और आंकड़ों को शामिल करके अध्यन किया गया। कृषि में महिलाओं के लिए प्रकाशनों और प्रौद्योगिकियों पर GKS को भा. कृ. अनु. प. के कृषि पोर्टल के साथ समकालीन भी किया गया।

ओडिशा के कटक जिले के निशिंतकोइली ब्लॉक के सांकिलो और टेंटलपुर गांवों में पोषण बढ़ाने वाली विभिन्न प्रौद्योगिकियों का मूल्यांकन भागीदारी के अंतर्गत किया गया था। नई शुरू की गई चावल की किस्में CR धन-१२ (उपज ६.२ टन / हे.) के प्रदर्शन में औसत उपज, मौजूदा पूजा किस्म की तुलना में (५६.२ %) अधिक थी। डेयरी घटक में खनिज मिश्रण के साथ पूरक संतुलित राशन खिलाने की दर सबसे बेहतर (६२ %) पाई गई, इसके बाद बारहमासी प्रोटीन युक्त चारे की खेती (५० %), हरे चारे की भूसी (४२ %) खिलाना कुल मिश्रित राशन (३८ %) था . NASF परियोजना के तहत, ४० कृषि परिवारों के नमूने से SHEET (सामाजिक-स्वास्थ्य-पर्यावरण-आर्थिक-तकनीकी) मॉड्यूल का उपयोग करके लिंग अंतर संकेतकों की पहचान और मूल्यांकन किया गया। लिंग अंतर के प्रमुख क्षेत्रों की पहचान सामाजिक पहलू में 'समान रूप से किए गए कार्य के लिए समान रूप से भुगतान' (८२.५ %); स्वास्थ्य और पोषण के पहलू में 'महिलाओं का बीएमआई (बॉडी मास इंडेक्स) अनुशंसित बीएमआई के बराबर (९२.५ %) था ; पर्यावरणीय पहलू में 'समान पहुंच, भूमि और पानी पर नियंत्रण' (७२.५ %); तकनीकी पहलुओं में क्रमशः 'वित्तीय संस्थानों से ऋण प्राप्ति (८७.५ %) आर्थिक और 'फसल उत्पादन कटाई के बाद की गतिविधियों में ज्ञान' (५७.५%) हुआ । आजीविका उत्थान, पोषण वृद्धि और उद्यमिता विकास के लिए 'लैंगिक संवेदनशील कृषि-बागवानी फसल प्रणाली मॉडल' के लिए एक त्रि-स्तरीय मॉडल विकसित किया गया था। सब्जियों का उच्चतम लाभ लागत अनुपात, बैंगन (३.४१) और उसके बाद मिर्च (३.२०) में देखा गया। फसल मोड्यूल में धान में लाभ अनुपात CR Dhan ३१२ में सबसे अधिक पाया गया, इसके बाद प्रधान धान (२.२९) और मौदमणि (२.२५) किस्में थी ओडिशा के मयूरभंज जिलों के बस्किटला और हरेकृष्णपुर गांवों मेंआम के बाग के प्रबंधन पर भागीदारी अनुसंधान के अंतर्गत, फलों की गिरने की गंभीरता, गैर मौसमी पुष्प प्रेरण, शाखा पतलापन

और उत्प्रेरण में वृद्धि मंदक अनुप्रयोग पर आदिवासी परिवारों के लिए प्रौद्योगिकियों को अनुकूलित और विस्तारित किया गया आम में त्वरित फलन, फलों, सब्जियों के संरक्षण और मूल्यवर्धन के लिए आवश्यक उनके ज्ञान और कौशल को बढ़ाने के लिए एक योजनाबद्ध मॉडल विकसित किया। एकीकृत खेती मॉडल में पौष्टिक सब्जियां और कुक्कुट पालन और/या मशरूम की खेती की ऊर्ध्वाधर खेती स्थापित करने के लिए बाहरी स्थिति में लोहे से बने कम लागत वाली त्रिकोणीय आकार संरचना के साथ एक लिंग अनुकूल एकीकृत ऊर्ध्वाधर पोषक-कृषि प्रणाली (IVNFS) मॉडल विकसित किया गया था। गजपति जिले के आर. उदयगिरि प्रखंड में महिलाओं को अपनी खाद्य फसलों के लिए कटाई के उपरांत आने वाली बाधाओं का अध्ययन करने के लिए एक सर्वेक्षण किया गया। इस अध्ययन में कोल्ड स्टोरेज की कमी (९५.७५), धन की कमी (८८.२७), अनुचित रखरखाव और खराब पैकेजिंग (८०.६५) प्रमुख बाधाएं पाई गईं। तदनुसार मूल्य संवर्धन परियोजना के तहत अनुसंधान उपचार की योजना बनाई गई।

खलगांव, जगतसिंहपुर में किए गए एक अध्ययन से पता चला कि पूरक खनिज मिश्रण के लगातार खिलाने से उच्च नस्ल की गायों के स्तनपान और प्रजनन प्रदर्शन में आर्थिक रूप से सुधार होता है। दैनिक दूध की उपज और एफसीएम उपज में क्रमशः १४-१६% और १८-२०% की वृद्धि हुई, जो कि क्रॉसब्रेड गायों को दूध पिलाने की लागत (२५-३०%) से बेहतर शुद्ध लाभ के साथ थी। विभिन्न तकनीकों में बारहमासी चारे की खेती को सर्वाधिक (६०%) अपनाया गया, इसके बाद खनिज मिश्रण और नमक के साथ घर का बना संतुलित राशन खिलाना (५५%) था. जीराबादी, भंजनगर और बानपुर, खुर्दा ज़िले में ब्लैक बंगाल नस्ल की बकरियों पर किए गए अध्ययन से पता चला है कि खनिज मिश्रण के साथ प्रोटीनयुक्त आहार खिलाने से उच्च गर्भाधान दर, गर्भपात की घटनाओं में कमी और बांझपन की समस्याओं के माध्यम से प्रजनन क्षमता में २५-३०% तक सुधार हुआ। इसी तरह, ब्लैक बंगाल बकरियों को खिलाने वाले प्रोटीन और खनिज पूरक आहार में पोषक तत्वों के उपयोग, खनिज जैवउपलब्धता और विकास प्रदर्शन को भी बढ़ाया गया था। जिसके परिणामस्वरूप उच्च शुद्ध लाभ (८५.६२ %) प्राप्त हुआ। पारिवारिक कुक्कुट उत्पादन मॉडल को ओडिशा के पुरी जिले के निमापाड़ा ब्लॉक के चनरापाड़ा और परिचनरपाड़ा गांवों में ४० कृषि परिवारों के समूह में लागू किया गया इसका उद्देश्य कृषि परिवारों की आय बढ़ाना और पोषण सुरक्षा में सुधार करना था। औसत शुद्ध आय में रु. ७५०-८०० प्रति परिवार का इज़ाफ़ा हुआ। महिलाओं ने अपने दरवाजे पर अंडे और कुक्कुट के विपणन में महत्वपूर्ण भूमिका निभाई। पुरी जिले के सत्यबादी प्रखंड,में चार गांवों में ग्रामीण महिलाओं की भागीदारी के साथ उद्यमिता विकास किया गया। जिसमें देशी तालाबों में छोटी देशी मछलियों के साथ भारतीय प्रमुख कार्पों की पॉलीकल्चर की तकनीक को लोकप्रिय बनाया गया।

भाकृअनुप- CIWA-IRRI सहयोगी अनुसन्धान परियोजना के तहत कोरापुट में भागीदार संस्थान प्रगति की मदद से "चित्रा डोरा" नामक एक महिला किसान उत्पादक कंपनी का गठन किया गया था, जिसमें सुगंधित चावल के सामूहिक विपणन के लिए ३० उत्पादक समूहों को शामिल करते हुए १०३१ आदिवासी महिला किसानो को शामिल किया गया। कोरापुट जिले के कोटपाड़ ब्लॉक के बी. घाटरला गांव में शेलर चावल प्रसंस्करण इकाई की स्थापना की गई और उत्पादक कंपनी के ५ सदस्यों को चावल प्रसंस्करण इकाई के संचालन पर प्रशिक्षित किया गया। स्वयं सहायता समूह, पुरी के 200 मछुआरों और १७ स्वयं सहायता समूहों से ४० मास्टर प्रशिक्षकों का चयन किया गया और कौशल आधारित क्षमता विकास का मूल्यवर्धन किया गया। ई-बैंकिंग, ई-कॉमर्स और सोशल मीडिया जैसी डिजिटल तकनीकों के माध्यम से मिशन शक्ति, ओडिशा के साथ बाजार जुड़ाव सुनिश्चित किया गया। मूल्य वर्धित उत्पादों को फिशलाइक्स के व्यापार नाम के तहत मार्केटिंग वेबसाइट bikayi.कॉम पर भी प्रदर्शित किया गया था। फाल्कन चिल्का फ्रेश रिटेल के साथ ग्रामीण महिला स्वंयं सहायता समूह के मार्केट लिंकेज को मजबूत किया गया। भुवनेश्वर में उनके आर्थिक सशक्तिकरण के लिए बिक्री बाज़ार की स्थापना की गई।

अतिरिक्ति भीति अनुसंधान परियोजना के तहत संस्थान-उद्योग-महिला किसान श्रंखलास्थापित करने के लिए तीन प्रमुख क्षेत्रों बागवानी, डेयरी और कृषि उपकरण स्थापित किए गए डेयरी क्षेत्र में दो-दो उद्योग (OMFED और दुग्ध मंत्र); बागवानी क्षेत्र (जैविक और कमल उद्यम की कला) और कृषि उपकरण क्षेत्र (UNICUS और साई शक्ति उद्योग) संस्थान के साथ जोड़ा गया है। चयनित कृषि-आधारित उद्योगों में महिलाओं और लैंगिक मुद्दों को समझने के लिए प्रत्येक क्षेत्र की १०० कृषि महिलाओं की भूमिका के प्रदर्शन, जरूरतों, धारणाओं और बाधाओं पर भाग लेने के लिए एक सर्वेक्षण किया गया प्रमुख बाधा के रूप में 'औद्योगिक कृषि कार्यान्वयन उत्पादन की प्रकृति' १००% कृषि महिलाओं द्वारा व्यक्त किया गया, इसके बाद 'पुरुष प्रधान नौकरी और उच्च शारीरिक शक्ति की आवश्यकता (९५%) और 'इसके लिए उचित तकनीकी शिक्षा और प्रशिक्षण की कमी' (९०%) पाए गए।

एक हाथ से चलाया जाने वाला डिस्क रिजर विकसित किया गया था और उचित कार्य विश्राम चक्र के साथ रिज और चैनल बनाने के लिए परिचालन मानकों के लिए परीक्षण किया गया। इसकी उत्पादन क्षमता ४२७ m2/h थी, जो कुदाल का उपयोग करने की पारंपरिक

विधि के ५ गुना से अधिक है। व्यक्ति के चलने की गति १.७८ किमी/घंटा है। परियोजना के अंतर्गत ओडिशा, केरल और महाराष्ट्र राज्यों के क्रमशः बालीडीहा, चोलोनोम और अलीबाग गांवों में किए गए अध्ययन के तहत लिंग आधारित कठिन परिश्रम वाली गतिविधियों का आकलन करने और मछली प्रसंस्करण प्रौद्योगिकियों को परिष्कृत करने के लिए किया गया। छंटाई और सफाई को सर्वाधिक थकाऊ पाया गया जिसके लिए लगातार बैठने की स्थिति की आवश्यकता होती है। निर्वाह करने वाली मछुआरे अत्यधिक तापमान, खराब श्रम दक्षता प्रथाओं और रोग आदि के संपर्क में आने के कारण विभिन्न व्यावसायिक स्वास्थ्य खतरों से ग्रस्त थे।

कृषि में श्रम दक्षता और सुरक्षा पर AICRP के तहत, विकसित मूंगफली स्ट्रिपर का परीक्षण आवश्यक संशोधन किया गया। देश भर के 12 राज्यों में 13 कृषि विश्वविद्यालयों में AICRP (गृह विज्ञान) केंद्रों के तहत, मधुमेह जैसे गैर-संचारी रोगों को संबोधित करने के लिए कम ग्लाइसेमिक इंडेक्स (GI) वाले विभिन्न खाद्य समूहों के कुल 362 खाद्य पदार्थों का दस्तावेजीकरण किया गया। मधुमेह के प्रबंधन के लिए ग्लाइसेमिक इंडेक्स खाद्य पदार्थ तैयार किए गए थे। अत्यधिक पोषण/मोटापे के प्रबंधन के लिए स्थानीय रूप से उपलब्ध अनाज, बाजरा, दालों और अन्य कार्यात्मक खाद्य सामग्री से उच्च फाइबर बहुआनाजी मिश्रण के उत्पाद तैयार किए गए। उच्च फाइबर खाद्य मिश्रण के व्यावसायीकरण के लिए AICRP (HS) के केंद्र UAS, GKVK, बैंगलोर द्वारा दो समझौता ज्ञापनों पर हस्ताक्षर किए गए। कला रूपों और डिजाइन के सिद्धांतों के साथ कपड़ा डिजाइनिंग के अनुरूप कला रूपों को डिजीटल किया गया। UAS, धारवाड़ केंद्र द्वारा आविष्कार किए गए "नर्सरी के लिए बायोडिग्रेडेबल मेस्टा कम्पोजिट पॉट्स" पर एक पेटेंट दायर किया गया है। कृषि और संबद्ध क्षेत्रों में आईसीटी के उपयोग को बढ़ाने के लिए कृषि महिला ज्ञान समूहों को बढ़ावा दिया गया है और ११ केंद्रों से 1100 कृषि महिलाओं और 1100 ग्रामीण पुरुषों से आकंड़ा एकत्र किया गया।

मानव संसाधन विकास कार्यक्रम के तहत संस्थान द्वारा कुल १९ संगोष्ठी, वेबिनार और लैंगिक परिप्रेक्ष्य में विविध विषयों पर वार्ता आयोजित की गई। कोरोना महामारी वर्ष के दौरान ५० से अधिक राष्ट्रीय और अंतर्राष्ट्रीय वेबिनार में वैज्ञानिक और तकनीकी कर्मचारियों ने भागीदारी की और अपने ज्ञान को समृद्ध किया। संस्थान में भौतिक के साथ-साथ आभासी माध्यम से २३ प्रशिक्षण कार्यक्रम आयोजित किए गए। संस्थान ने मेरा गांव मेरा गौरव कार्यक्रम के तहत वैज्ञानिक और तकनीकी कर्मचारियों की चार टीमों का गठन किया गया जिसमें प्रत्येक टीम ने ४-५ गांवों को गोद लिया था इस प्रकार कुल २० गांवों को गोद लिया गया. बागवानी, पशुपालन, मत्स्य पालन, कृषि मशीनरी और गृह विज्ञान जैसे बहुत विविधता वाले क्षेत्र में महिलाओं के ज्ञान कौशल का विस्तार किया गया। संस्थान द्वारा विकसित प्रौद्योगिकी को लोकप्रिय बनाने के लिए देश भर में विभिन्न प्रदर्शनियों में भाग लिया। विभिन्न अवसरों पर आयोजित २१ गोष्ठियों में कुल ११३५ महिला किसानों ने भाग लिया। वर्ष के दौरान, ९०५ प्रतिभागियों को इनपुट/तकनीकी बैक स्टॉपिंग/महिला अनुकूल प्रौद्योगिकियों से परिचित कराया गया था, २२० किसानों को ४३ मोबाइल आधारित सलाह के माध्यम से संबोधित किया गया था, ७८ कृषि-आधारित साहित्य से २८४० किसानों को लाभान्वित किया गया था। अनुसूचित जाति उप-योजना के तहत विभिन्न गांवों में विभिन्न इंटरफेस और कौशल उन्नयन कार्यक्रमों के माध्यम से महिला अनुकूल प्रौद्योगिकी का प्रसार, लाभार्थियों की क्षमता निर्माण, निवेश समर्थन और कृषि महिलाओं को प्रौद्योगिकी प्रदर्शन पर ध्यान केंद्रित किया गया था। स्वच्छ भारत अभियान को संस्थान के प्रौद्योगिकी हस्तांतरण कार्यक्रमों के साथ पूरे भारत में एकीकृत किया गया था, ताकि आभासी माध्यम से गोद लिए गए गांवों में जागरूकता अभियान चलाया जा सके और सामाजिक दूरी और COVID के दिशानिर्देशों का पालन किया जा सके। अवधि के दौरान सामूहिक वृक्षारोपण कार्यक्रम, सार्वजनिक स्थानों की सफाई, प्लास्टिक अपशिष्ट प्रबंधन, कार्यालय अभिलेखों रख रखाव / ई-ऑफिस कार्यान्वयन, रसोई और घरेलू अपशिष्ट सामग्री का खाद, स्वच्छ और हरित प्रौद्योगिकियों को बढ़ावा देना, जैविक आवासीय कॉलोनियों के किचन गार्डन में खेती के तरीके अपनाए गए। संस्थान ने अंतर्राष्ट्रीय योग दिवस, महिला किसान दिवस, विश्व खाद्य दिवस, संविधान दिवस और नागरिक कर्तव्य अभियान, कृषि शिक्षा दिवस, कृषि में महिला दिवस, हिंदी पखवाड़ा पूरे समर्पण से मनाया। संस्थान ने इस अवधि के दौरान ३३ शोध पत्र, १८ लोकप्रिय लेख, २ तकनीकी बुलेटिन, ३ संग्रह और १ फ़ोल्डर प्रकाशित किया है। संस्थान को २०२० कृषि में सर्वश्रेष्ठ एशियाई महिला संस्थान का पुरस्कार भी मिला है।

EXECUTIVE SUMMARY

ICAR-Central Institute for Women in Agriculture, Bhubaneswar carries out action research programmes in diverse aspects related to women in agriculture. Various research and extension based activities are executed through in-house, inter-institutional, network or collaborative and coordinated modes of research. During 2020, the Institute executed 21 research projects, 4 externally funded projects, AICRP on Ergonomics and Safety in Agriculture (ESA) and AICRP on Home Science focusing on farm women nutritional security, livelihood enhancement, technological empowerment, drudgery reduction and entrepreneurship development. The salient achievements in research, extension and technology transfer activities are summarised.

Women's involvement in agriculture is diverse. The sectoral contribution of farm women indicates that the highest female agricultural workers as percent of population (28) was in agro climatic region (ACR) 7 and 14. A total of five ACR (7, 8, 9, 10, 14) had more than 20% female agricultural workers and five ACR (3, 5, 6, 12 and 15) lower than 10 percent. Similarly, as percent of population female cultivators were highest (22.8) in Western dry region (ACR 14) followed by western Himalayan region (17.4). Under the initiative of maintaining technology database the list of gender experts (50) as well as institutions (31) working for women has been created. The impact assessment of the training programme was done to know the changes in the skill and attitude of 160 extension functionaries. The highest percentage of improvement was found understanding needs of women (146%) followed by rapport building (131%), understanding economic life of women (131%), communication (53.33%) and understanding farming system activities of women (44.44%). The average improvement in skill over pre-training was 101.4% while it was observed to be 49% and 92% in case of before and after training, respectively. Reliable gender disaggregated data in key areas of their socio-economic involvement are critical for effective planning of gender based strategies. The present GKS in Agriculture portal contains information related to technologies, resource material (publications viz. training manuals, technical bulletins, gender notes/ policy briefs etc.), national schemes and programmes exclusively for women in agriculture, information and statistics related to women in agriculture, information on gender and related indicators, books and journals on gender in agriculture and gender in agriculture related databases. 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.

Different nutrition enhancing technologies were evaluated in participatory mode in Sankilo and Tentalpur villages of Nishintakoili block in Cuttack district of Odisha. Average demonstration yield of newly introduced rice varieties (6.2 t/ha) was higher (56.2%) in comparison to existing farmers' practice with variety Puja. In dairy farming component the adoption rate of feeding balanced ration supplemented with mineral mixture was found to be most preferable (62%), followed by fodder cultivation of perennial protein rich fodder (50%), chaffing of green fodder (42%) and feeding total mixed ration (38%). Under NASF project, gender gap indicators were identified and assessed using the SHEET (Social-Health-Environmental-Economic-Technological) module from a sample comprising of 40 farm families. The major areas of gender gap identified were 'equally paid for same amount of work done'(82.5%) in social aspect; 'BMI (Body Mass Index) of female is at par with recommended BMI' (92.5%) in health and nutrition aspect; 'equal access, control over land and water' (72.5%) in environmental aspect; 'avail loan from financial institutions'(87.5%) in economic and 'knowledge in carrying out crop production and post-harvest activities' (57.5%) in technological aspects, respectively. A three-tier approach for 'Gender Sensitive Agri-Horti cropping system model' was developed for livelihood upliftment, nutritional enhancement and entrepreneurship development. Highest benefit cost ratio of vegetables, observed in Brinjal (3.41) followed by chilli (3.20). In crop module the benefit ratio in paddy was found to be highest in var. CR-Dhan 312 (2.46) followed by var. Pradhan Dhan (2.29) and var. Maudamani (2.25).

The participatory action research on mango orchard management in Baskitala and Harekrushnapur villages of Mayurbhanj districts of Odisha, technologies were optimized and extended to tribal families especially on managing the severity of fruit drop, off-season floral induction, branch thinning and growth retardant application in inducing accelerated fruiting in mango. A schematic model was developed to enhance their

knowledge and skill required for preservation and value addition of fruits, vegetables and millets. A gender friendly integrated vertical nutri-farming system (IVNFS) model with a low-cost triangular shape structure made up of iron in outdoor condition was developed to establish vertical cultivation of nutritious vegetables and poultry farming and/or mushroom cultivation in an integrated approach round the year. A survey was conducted in R. Udayagiri block of Gajapati district to study post-harvest constraints faced by women for their food crops viz. as mango, pine apple, bael and tomato. Lack of cold storage (95.75) followed by lack of access to credit (88.27) and inappropriate handling and poor packaging (80.65) were found to be major constraints. Accordingly the research treatments were planned under the value addition project.

A study conducted at Khalgaon, Jagatsinghpur revealed that consistent feeding of supplemental mineral mixture economically improved lactation and reproductive performance of crossbred cows. The daily milk yield and FCM yield was augmented by 14-16% and 18-20%, respectively in lactating crossbred cows with improved net return over feed cost (25-30%). Propagation of perennial fodder cultivation (60%) was highly adopted followed by feeding of homemade balanced ration with mineral mixture and salt (55%). Study conducted on Black Bengal goats at Jirabadi, Bhanjanagar and Banapur, Khorda revealed that the reproductive efficiency was improved by 25-30% through higher conception rate, less incidence of abortion and infertility problems by feeding of proteinaceous diet along with mineral mixture. Similarly, nutrient utilization, mineral bioavailability and growth performance was also enhanced in Black Bengal goats fed protein and mineral supplemented diet following complete package of practice under semi-intensive system of rearing resulting higher net profit (85.62%). The family poultry production model was implemented in a cluster of 40 farm families in Chanrapada and Parichanrapada villages of Nimapada block of Puri district, Odisha with the objective of enhancing income and improving nutrition security of farm families. The average net income was increased by Rs. 750-800/household in the farming system. Farm women played an important role in marketing of eggs and chicken at their doorstep. Under the entrepreneurship development with fisheries participation of rural women in four villages of Satyabadi block, Puri district was taken up. The technology of polyculture of Indian major carps with small indigenous fishes in homestead ponds was popularised.

Under the ICAR-CIWA-IRRI collaborative project a Women Farmer Producer Company named “Chitri Dora" was formed with the help of guarantee partner PRAGATI at Koraput involving 1031 tribal women farmer, covering 30 producer groups, for collective marketing of aromatic rice. A rubber sheller rice processing unit was established in B. Ghatarla village of Kotpad block in Koraput district and 5 members of the producer company were trained on operation of the rice processing unit. Skill based capacity development of 200 fisherwomen of SHGs, Puri was imparted on value addition of fish in entrepreneurship mode and 40 master trainers were selected from 17 SHG groups. The market linkage was ensured with Mission Shakti, Odisha through digital technologies like e-banking, e-commerce and social media. The value added products were also displayed through the marketing website bikayi.com under the trade name Fishlikes. Market linkage of rural women SHGs was strengthened with Falcon Chilka Fresh retail outlets in Bhubaneswar for their economic empowerment.

Under the extra-mural project three major sectors viz., horticulture, dairy and farm implements for establishing institute-industry-women farmers’ linkage was established. 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 linked with the institute. A survey of participating 100 farm women from each sector was conducted on their role performance, needs, perceptions and constraints to understand the women and gender issues in selected agro-based industries. The major constraint was the ‘nature of industrial farm implement production is hazardous’ as expressed by 100 % 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%).

A manual disc ridger was developed and tested for operational parameters to form ridges and channel with proper work rest cycle. The output capacity was 427 m2/h, which is more than 5 times the traditional method by using spade. The walking speed of the subject is 1.78 km/h. To assess the gender based drudgery prone activities and refining the fish processing technologies under the study conducted in Balidiha, Chollonom and Alibag villages of Odisha, Kerala and Maharashtra states, respectively. Sorting and cleaning were found to be tedious which requires constant squatting position. The subsistence fisherwomen were prone to various occupational health hazards due to exposure to extreme temperature, poor ergonomic practices and exposure

to pathogens, whitlow etc.

Under AICRP on Ergonomics and Safety in Agriculture, the developed groundnut stripper was tested for 20 hours as per according to the "Test code for power thresher for groundnut" with essential modification. Under AICRP (Home Science) centres at 13 Agricultural Universities in 12 states across the nation, a total of 362 foods from different food groups having low Glycemic Index (GI) for addressing non-communicable diseases such as diabetes were documented and a database on low glycemic index foods for the management of diabetes was prepared. The products of High fibre multigrain mix has been formulated from locally available cereals, millets, pulses and other functional food ingredients (FFIs) for management of over nutrition/obesity. Two MoU were signed by ICAR-CIWA and AICRP Centre UAS, GKVK, Bangalore for commercialization of High Fibre Food Mix. The art forms were digitized to suit textile designing with the arts and principles of design. A Patent was filed on “Biodegradable Mesta Composite Pots for Nurseries” invented by UAS, Dharwad centre. Farm Women Knowledge Groups (FWKGs) were promoted for enhanced use of ICT in Agriculture and Allied Sectors has been undertaken and data has been collected from 1100 farm women and 1100 rural men from eleven centres.

Under the human resource development programme, a total of 19 seminar, webinars and talks on diverse topics in gender perspective were organised by the institute. Participation of scientist and technical staff in more than 50 national and international webinars during the pandemic year also enriched their knowledge. Twenty three training programmes were organized in the institute through physical as well as virtual mode. Institute participated in various exhibitions across the country to popularize the technology developed by the institute. Under MGMG programme four teams comprising of scientific and technical staff were formed with each team adopting 4-5 villages and a total of 20 villages were adopted and provided much diversity areas like Horticulture, Animal Husbandry, Fisheries, Farm Machinery and Power and Home Science. A total of 1135 women farmers participated in 21 gosthis conducted virtually during various occasions. During the year, 905 participants had received inputs/ technical back stopping/introduced to women friendly technologies, 220 farmers were addressed through 43 mobile based advisories, 78 farm-based literatures benefitting 2840 farmers. Under the Scheduled Castes Sub-Plan the focus was on women friendly technology dissemination, capacity building of beneficiaries, input support and technology showcasing to farm women through various interfaces and skill upgradation programmes in different villages.

The Swachha Bharat Abhiyan was integrated with technology transfer programmes of the institute in PAN India mode to create awareness campaign in adopted villages through virtual mode and promoted following social distance and guidelines of COVID. During the period mass plantation programme, cleaning of public places, plastic waste management, stock taking on digitization of office records/ e-office implementation, generation of wealth from waste, composting of kitchen and home waste materials, promoting clean and green technologies, organic farming practices in kitchen gardens of residential colonies were carried out. Institute also celebrated International Day of Yoga, Mahila Kisan Diwas, World Food Day, Constitution Day and Citizens’ Duties Campaign, Agricultural Education Day, Women in Agriculture Day, Hindi Pakhwada. The Institute has published 33 research papers, 18 popular articles, 2 technical bulletin, 3 compendiums and one folder during the period. The institute has also received award on best Asian Institute for Women in Agriculture.

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ICAR - CENTRAL INSTITUTE FOR WOMEN IN AGRICULTURE

ICAR-Central Institute for Women in Agriculture (CIWA), under Indian Council of Agricultural Research, New Delhi, an autonomous organisation under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare, Government of India with a 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 has been undertaking research on several issues affecting women and their opportunities in agriculture.

Institute is implementing various research projects to address its mandate - Research on gender issues in agriculture and allied fields; Gender-equitable agricultural policies/ programmes and gender-sensitive agricultural-sector responses in Pan – India mode at 13 State Agricultural Universities in 12 states across the country to empower women in agriculture for their improved nutrition, livelihood security and drudgery reduction, occupational health hazards and capacity building of agrarian families by coordinating All India Coordinated Research Project on Home Science.

12th February, 2020 | Taj Lands End, Mumbai

Confered by

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1. INTRODUCTION

1.1 Historical Perspective

ICAR-Central Institute for Women in Agriculture is an institution exclusively devoted to gender related research in Agriculture. Since its inception as National Research Centre for Women in Agriculture (NRCWA) in April 1996 at Bhubaneswar (Odisha) under Indian Council of Agricultural Research, New Delhi as per recommendation of 8th Five Year Plan (1992-97), the institute has been undertaking research on various issues of women's role and participation and the emerging opportunities in agriculture. 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 institute was upgraded to Directorate of Research for Women in Agriculture (DRWA) in 2009 and to ICAR-Central Institute for Women in Agriculture (ICAR-CIWA) in the year 2014 under 12th Five Year Plan (2012-17). The AICRP (HS) has now been renamed as AICRP (Women in Agriculture). ICAR-CIWA has been playing a pivotal role towards engendering agricultural research and development. Apart from engaging other ICAR institutions to strengthen gender perspective in agricultural research programmes, the institute acts as a resource agency for many government departments for gender mainstreaming through training, consultancy and advocacy. ICAR-CIWA emphasizes upon participatory action research in different technology based thematic areas involving farm women to test suitability of farm technologies and further refinement to make women friendly. The Institute also facilitate research and development institutions to work on gender perspectives in their research and development programmes.

1.2 Research Area

The research projects implemented by the research institution yielded important gender related information, knowledge, models and practices that can be used for identifying interventions and developing programmes for different stakeholders including farm women. It 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, extension methodologies and entrepreneurship development. Given the critical linkage between women and agricultural growth, the ICAR vision of achieving adequate production of nutritious and safe food for feeding its ever growing population would be possible only if gender issues in agriculture is addressed along with strengthening the attitude, interest, knowledge base and capability of women to manage the changes in agriculture.

1.3 Ongoing Activities

Empowerment of farm 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 is privileged 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.

1.4 Infrastructure Facilities

The Institute has a well-developed Agricultural Knowledge Management Unit with facilities of internet and latest data analysis software like SAS and SPSS. The Institute is having round the clock broad band/ optical fibre cable based internet connectivity over Local Area Network. Institute video conferencing system 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. 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. The Institute has a research farm of 32 acres including 15 acres area under different horticultural and field crops as well as livestock and 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. 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. 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. 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. 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. The trainees' hostel can accommodate 25 participants for various training programmes. The women farmers' hostel can accommodate 28 women participants for various training programmes. 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.

1.5 Finance

The information pertaining to budget AICRP expenditure and resource generation of ICAR-CIWA for the year 2020 is presented in graphs (*last page*).

1.6 Staff

Table 1.1 Details of cadre strength as on 31.12.2020 (ICAR-CIWA)

Post	Sanctioned Post (2020)	In Position
Research management position	3	-
Scientific	18	17
Technical Posts	13	12
Administrative	11	7
Skilled Support Staff	1	1
Total	46	37

1.7 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 1.2 RTI- for the year 2020

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	7	6	1	0	7	30

2. RESEARCH ACHIEVEMENTS

2.1 RESEARCH ACHIEVEMENTS (ICAR-CIWA)

2.1.1 Engendering agricultural research and extension through Gender Sensitization Technology Hub (2017-2020)

Sabita Mishra, Gayatri Moharana, Laxmi Priya Sahoo and Ananta Sarkar

Under the project, technologies collected from ICAR/ SAUs were screened and tested for suitability for farm women. A national level brain storming workshop was organised on 29th February, 2020 to chalk out the plan for developing the Techno-Hub and Gender-Sensitive Micro-Lab in which 17 gender experts at national level had participated including 11 CIWA scientists. The valuable suggestions emerged out of rich experience of the experts on the layout of technology museum to have three components like: (i) About overview of ICAR-CIWA, (ii) Technology on Women in Agriculture and (iii) Development of Gender Sensitization Micro-Lab. It was suggested to use form of presentation, multilingual language, displaying method, dynamic content and storyline containing socio-psychological matters. Socio-psychological matter in projective/ semi-projective/ non – projective approach should be followed in Gender Sensitization Micro-Lab. Following activities were undertaken:

- Collected materials in the areas of gender work participation scenario, malnutrition scenario, photo gallery of farm women, daily activity clock, government initiatives, technology in drudgery reduction, and development of questionnaire for pre and post evaluation of gender sensitiveness of the visitors.
- Compiled key questions with Solutions (145) for farm women covering seven areas of agriculture like: crop production, horticulture, mushroom production, food and nutrition, home management, child development and livestock management, and also linked with Gender Knowledge System in Agriculture Portal for development of Web-Based Database with a scope for the domain experts to login and post new FAQ.
- The database of 160 participants undergone training under this project, the list of gender experts (50) as well as institutions (31) working for women has been created.
- The impact assessment of the training programme was made to know the changes in the skill and attitude of 160 extension functionaries towards gender. It was measured with before training, after training and improvement over pre-training by using percentage analysis as reflected in the following table.

Table 2.1: Skill assessment for gender sensitiveness (n = 160)

Areas of Skill	Before Training	After Training	Improvement over pre-training (%)
Lack of skill in rapport building	38	88	131.58
Communication	60	92	53.33
Understanding economic life of women	42	97	130.95
Understanding needs of women	32	79	146.87
Understanding farming system activities of women	72	104	44.44
Average	49	92	101.43

Table 1 indicates that, there is significant improvement in the skill of the extension functionaries towards women clients. The highest percentage of improvement was found in case of understanding needs of women (146.87%) followed by rapport building (131.58%), understanding economic life of women (130.95%), communication (53.33%) and understanding farming system activities of women (44.44%). The average improvement in skill over pre-training was 101.43% while it was observed to be 49% and 92% in case of before and after training, respectively. Similarly, the change in attitude of the extension functionaries was also assessed which has been indicated in the Table below:

Table 2.2: Attitude assessment for gender sensitiveness (n = 160)

Areas of Skill	Before Training	AfterTraining	Impv. over pre-training (%)
Know farm women by face	34	81	138.23
Contact per week	48	77	102.63
Input support per season	136	154	13.23
Linked with market	10	12	20.00
Documentation of success story	04	07	75.00
Average	46.40	66.20	69.82

Table 2 depicts that, out of five areas of attitude, the highest improvement over pre-training was found in case of knowing farm women by face (138.23%) followed by contact per week (102.63%) and documenting success story (75.00%). On the other hand, the lowest change over pre-training was found to be only 13.23% in case of input support per season and 20.00% against linked with market. However, the average improvement in attitude over pre-training was 69.82% while it was observed to be 46.40% and 66.20% in case of before and after training respectively.

2.1.2 Designing and development of gender sensitive Agri-nutri (GSAN) farming system model (2019-22)

Lipi Das, S. K. Srivastava, Biswanath Sahoo, Praveen Jakhar, Sachidananda Swain and *Tania Seth*

During the second year (2020-21) of the research project as per the plan different gender sensitization activities were carried out in the operational villages. Agri-nutri education to farm women was imparted through multimedia modules, nutri-quizzes, presentations and discussion forms involving different stakeholders. Under objective 2 of the project; different nutrition enhancing technologies were evaluated in participatory trial mode in Sankilo and Tentalpur villages of Nishintakoili block in Cuttack district. Under crop module of nutri-farming system high yielding and nutritive varieties of rice were evaluated in 40 nos. of women farmers' field in total area of 8 ha.

Demonstration under crop-based module (Rice)

Average demonstration yield of newly introduced rice varieties was higher under as compared to existing farmers' practice (Variety Puja). On an average, 56.2% yield advantage was recorded under demonstrations carried out with improved seed material and scientific package of practice. An extension gap ranging from 26.5 to 15.2 q/ha in yield was observed between demonstrated technology and farmers' practice. Through introduction of these high protein content HYV varieties an additional mean protein yield of 2.89q/ha was added. This will help to meet out nutrition requirement of women as well as provide sufficient zinc. Technology index indicates the feasibility of the evolved technology in the farmers' fields. Technology index revolved around 18% during the study. The economic analysis of trial indicates higher mean gross and net returns of the demonstration to the tune of ₹1,16,663 and ₹64,213, respectively. Owing to improved seed and other inputs; the average cost of cultivation (₹52,450) in demonstration plots was higher in comparison to FP. On mean values basis, an additional investment of ₹12,983/ha was made under demonstrations gave additional gross returns of ₹41,943 per ha. Maximum net returns of ₹75,564 was obtained in CR Dhan 312 cultivation.

Demonstration under horticulture-based module

Nutritional benefits of horticultural crops indicated that the intake of cowpea, amaranthus, pumpkin and papaya being rich source of protein, dietary fibre, calcium and vitamin A provide essential nutrients to the family members. Among the horticultural crops the farm families preferred to cultivate papaya followed by banana (both plantain and dessert type) followed by cowpea and pumpkin. The nutrition awareness about these crops was still very low among them. Awareness on nutritional aspect among the 40 farm families was analyzed.

Demonstration under Animal Husbandry Module

Effect of feeding balanced ration on nutritional quality of milk

Based on the survey report, it was revealed that about 70% of farm women involved in dairy-farming in the study area mostly sell milk neglecting family consumption and preparation of home based value added products. Identified need based nutrition enhancing technologies i.e., preparation of balanced ration supplemented with critical nutrients (mineral mixture), suitable fodder cultivation (hybrid napier Yashwant, IGFRI-6, sugar cane fodder), chaffing of fodder and preparation of total mixed ration were evaluated in participatory trial mode. The adoption rate of feeding balanced ration supplemented with mineral mixture was found to be most preferable (62%), followed by fodder cultivation of perennial protein rich fodder (50%), chaffing of green fodder (42%) and feeding total mixed ration (38%).

Table-2.3: Rice yield and gap analysis under participatory demonstrations (N=40)

Variety	Demo. Area (Ha.)	Demo. yield (t/ ha)	Increase over local variety (%)	Ext. gap (q/ ha)	Technology gap (q/ ha)	Technology index (%)
CR Dhan 312	4.0	68.5	63.2	26.5	11.5	14.3
CR Dhan 307 (Maudamani)	2.2	55.2	38.0	15.2	16.8	23.3
CR Dhan 409 (Pradhan)	1.8	63.6	67.4	25.6	14.4	18.4
Mean		62.5	56.2	22.5	14.2	18.7

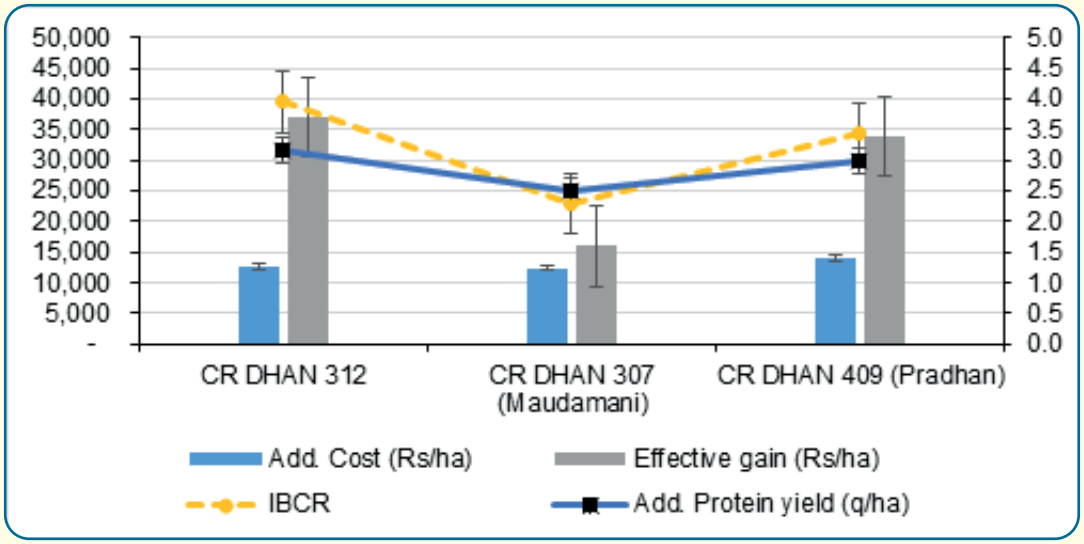


Fig 2.1.1 Economic analysis on varieties demonstration

Table 2.4: Distribution of Farm Women According to Overall Nutritional Awareness Level (N=40)

Sl. No.	Categories of Awareness Level	Frequency	Percentage
1.	Very Well Aware (> 60%)	07	17.50
2.	Moderately Aware (30-60%)	13	32.50
3.	Some What Aware (< 30%)	20	50.00

Table- 2.5: Preferences of Horticulture Crops Perceived by Farmwomen (N=40)

Parameters	*% of the Total Weighted Score (out of 360)								Overall mean	Rank
	Cowpea	Pumpkin	Amaranthus	Bittergourd	Okra	Papaya	Plantain banana	Dessert banana		
High yield	88.88	92.22	48.33	89.44	90.00	62.77	42.22	42.22	69.51	II
High nutrient content	54.44	55.56	58.88	58.88	55.00	69.44	67.77	67.77	60.97	IV
Less irrigation required	43.88	42.77	55.00	47.77	48.33	53.88	45.00	45.00	47.70	VI
Easy to grow/cultivate	60.55	52.77	57.22	52.77	55.00	41.66	31.11	31.11	47.77	V
Easy seed availability	77.22	75.00	75.00	76.11	70.00	63.88	47.22	47.22	66.46	III
Less infestation of disease pest	31.66	31.11	46.66	30.00	32.78	28.89	36.11	36.11	34.17	IX
Good taste	28.33	31.67	51.11	26.11	30.56	51.67	73.33	73.33	45.76	VII
Good cooking quality	18.33	22.78	42.78	19.44	19.44	49.44	61.11	61.11	36.80	VIII
High market demand	98.33	97.22	65.55	99.44	98.89	95.56	100.00	100.00	94.37	I
Overall mean	55.74	55.68	55.61	55.55	55.56	57.47	55.99	55.99		
Rank	III	IV	V	VII	VI	I	II	II		

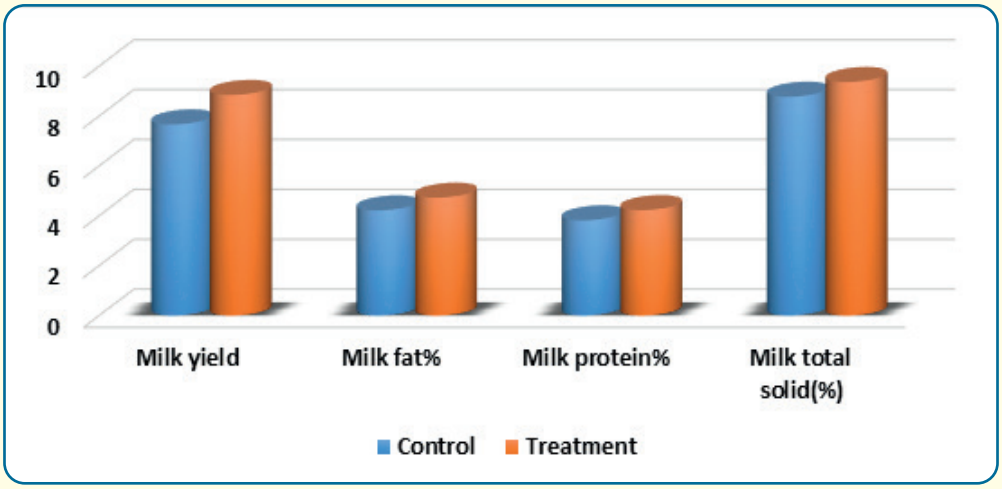


Fig 2.1.2 Effect of feeding balanced ration

2.1.3 Developing gender sensitive model for doubling farmers' income by addressing gender concerns and technological gaps (2017-2020)

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

The objectives of the study was 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 to develop a gender-sensitive model for doubling farmers' income. The impact of the developed gender-sensitive model for doubling farmers' income and the gender integration on family income and the cash in hand among farmwomen are given in Table below.

Table 2.6. Income enhancement through gender integration

Income generating activities	Women's contribution in labour (%)	Women's contribution in family income (%)
Crops	33.00	30.00
Livestock	68.00	65.00
Wage earning	Nil	Nil
Enterprises (Mushroom)	58.00	55.00
Services	Nil	Nil

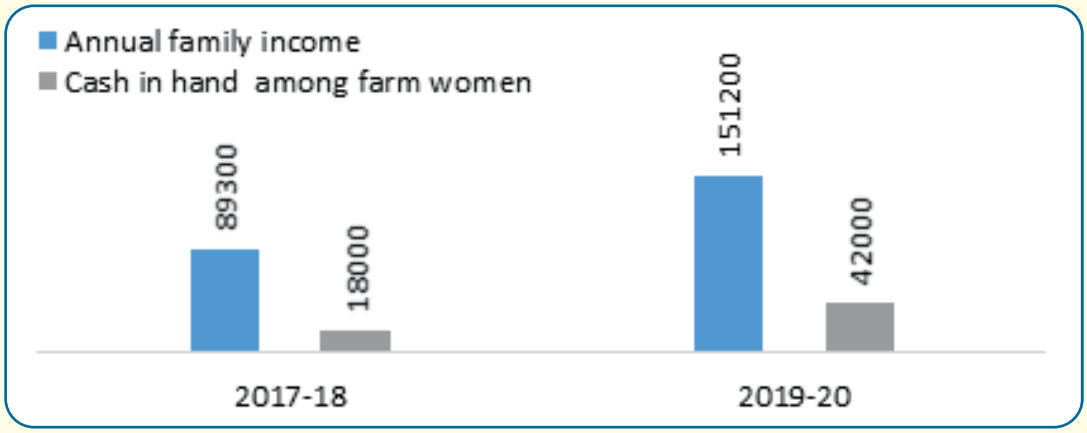


Fig.2.1.3. Impact on family income and the cash in hand among farmwomen

To increase the income of farm women, a range of strategies (economic, technological, infrastructural/ information, political/policy and social) need to be adopted to transform the current production-driven to income-driven farming system and reduce the disparity among farmers of different regions of India. A region

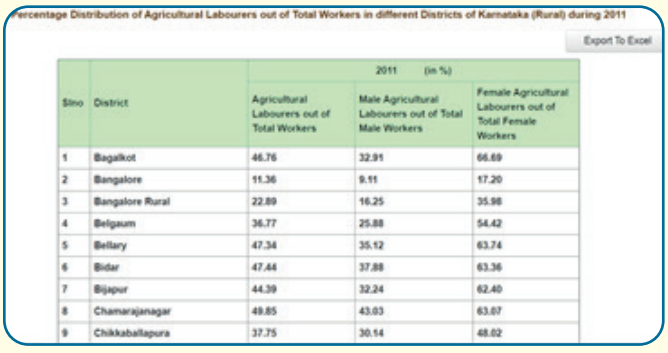
and state-specific action plan is required to address the constraints of increasing farmers' income. For gender mainstreaming the focus should be on; recognising women's role as farmer/ agripreneur, promoting agricultural education among farm women, creation of well-structured gender sensitive modules for effective transfer of technologies, gender mainstreaming in govt. programmes and policies, building resilience among farm women to cope with natural calamities and climate change and creating database on women's participation in agriculture. In order to optimise the net income, the input delivery mechanism needs to be strengthened, especially with regard to critical inputs and access to extension services for women in agriculture. Huge data gaps exist in assessment of the changes in farmers' income, savings and investments over time, and also lack of gender disaggregated data. There is a need to measure these components on a regular basis to formulate evidence-based appropriate policy interventions. The central and state machineries need to reform the agricultural marketing systems for enabling better price realisation by the farming communities, especially farmwomen. Online marketing may be facilitated for the producers of farmwomen and SHGs by providing suitable platforms and handholding support. Policy interventions are also needed to simply the procedural formalities of establishing Farmer Producer Organisations (FPOs).

2.1.4 Strengthening gender knowledge system in agriculture (2017-20)

Ananta Sarkar, J. Charles Jeeva, Jyoti Nayak, Sabita Mishra and Shaji, A.

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. 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 total of 600 publications of the Institute and AICRP (HS) were uploaded on the portal. Further, the dynamic database on state wise gender work participation in agriculture was enriched with district wise data. All the data tables can be downloaded in excel format for further use by stakeholders. Thirty two questions on FAQs related to concepts on women in agriculture have been added to the database for the benefit of researchers and students. For better management of AICRP (HS) scientists' data, the present employee profile entry form was modified and a new profile entry form was created.

GKS portal

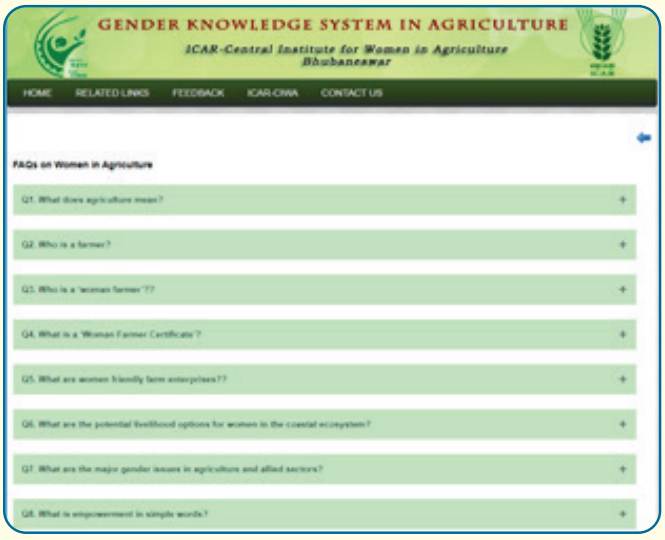

Percentage Distribution of Agricultural Labourers out of Total Workers in different Districts of Karnataka (Rural) during 2011

Export To Excel

Slno	District	2011 (in %)		
		Agricultural Labourers out of Total Workers	Male Agricultural Labourers out of Total Male Workers	Female Agricultural Labourers out of Total Female Workers
1	Bagalkot	46.76	32.91	66.69
2	Bangalore	11.36	9.11	17.20
3	Bangalore Rural	22.89	16.25	35.98
4	Belgaum	36.77	25.88	54.42
5	Bellary	47.34	35.12	63.74
6	Bidar	47.44	37.88	63.36
7	Bijapur	44.39	32.24	62.40
8	Chamarajanagar	49.85	43.03	63.67
9	Chikkaballapura	37.75	30.14	48.02

Output on district wise ratio statistics from dynamic database

Linking technology database (GKS) with KRISHI portal



GKS portal interactive features

Fig 2.1.4. GKS portal with technology database

2.1.5 Development of Integrated National Information System for Women in Agriculture (DINISWA) (2020-2023)

Ananta Sarkar and Neetish Kumar

Gender disaggregated data in agriculture needs to be readily available in public domain and collection, documentation and analysis of such data should be prioritized for development of integrated information system. The objectives of the project are to develop dynamic database for gender knowledge system in agriculture, to develop an online analytical tool for report generation and to develop dashboard for women in agriculture in India. Some Govt. departments/ agencies collect gender disaggregated data on work participation as workers, cultivators and agricultural labourers, male and female headed households, enrolment of students in agriculture, health and nutrition, income, wage rate, SHGs, migration, etc. which are available in public domain. Reliable gender disaggregated data in key areas of their socio-economic involvement are critical for effective planning of gender based strategies/ policies. The present Gender Knowledge System (GKS) in Agriculture portal (http://www.icar-ciwa.org.in/gks) contains information related to technologies, resource material (publications viz. training manuals, technical bulletins, gender notes/ policy briefs etc.), national schemes and programmes exclusively for women in agriculture, information and statistics related to women in agriculture, information on gender and related indicators, books and journals on gender in agriculture and gender in agriculture related databases. During the process of data collection and analysis, various indicators emerged which can form basis of capturing gender related data that can be helpful in future policy making. In the same line a virtual brainstorming workshop was organized with the focal point identification of new dimensions for preparing a national/global level database on women in agriculture on 28 August, 2020. Under the project, conceptual frameworks on format for gender factsheet of institutions and on format for profile of progressive women farmers of the country have been developed.

Gender Factsheet in Agriculture (Institute/Organization level)

Institutions/organizations under the ICAR is focussing on women in agriculture and generating gender disaggregated data on various parameters are not properly documented and available in public domain. Hence, an institute/organization gender factsheet in agriculture is being developed for capturing year wise information on various parameters related to gender in the domain of agriculture (viz. year wise research projects, technologies generated, staff details, trainings and capacity building, teaching (students enrolled), national schemes beneficiaries) that are already being done, but not properly documented. The factsheet aims at preparing a national level database on women for understanding the change in involvement of both men and women in various fields of agriculture over time. For developing the database, a web-based framework is conceptualized for online data collection and showcase of micro level (Institute wise) to macro level (National level) information. These factsheets may also be kept on the website of each institute/organization as gender disclosure and should be a separate chapter in their annual reports so that over a period of time, these information will be the base for understanding the change in gender component in different dimensions of agriculture in the country.

Profile of progressive women farmers of India

Large number of women have taken up farming as source of livelihood over years and many of them are successful in different sectors of agriculture in the country. Very less effort were being taken to showcase the success as well as the area of success except in the form of some success stories and case studies. A number of profile formats were being studied and a comprehensive format for profile of progressive women farmers was designed that contains information on basic information and on how she has been recognized as a progressive women farmer. The data base will be able to classify whether the farmer is an entrepreneur and/ or women leader, different sector wise and region wise list of farmers can be generated which may be useful for encouraging more and more women in farming.

2.1.6 Mapping livestock and gender and studying the role of institutions in livestock development in Eastern India (2017-20)

Anil Kumar, Biswanath Sahoo and Tanuja, S.

The livelihood of people through rearing of livestock depends on a number of factors. Land holding by the household is an important determinant of the number of livestock kept by the household. The data taken from NSSO 70th round (2012-13) revealed that in rural areas, the ownership of livestock species is markedly influenced by the size of land holding of the household. In India, there were 7.4 percent landless households (hh), 75.4% marginal and 10.0% small farming households. Small, marginal and landless (SMLL) hh together accounted for 92.8 percent of the total hh but owned only 53.3 percent of the total land. In other words, the SMLL households together owned 85.6 percent of the total livestock which were reared on the 53.3% of the total land they owned. On the other hand, 14.4 percent of the total livestock

were reared by 7.1 % of household belonging to the category semi-medium, medium and large (SMML) who owned 46.7 percent of the land. This clearly indicates that livestock is an important source of livelihood for the people who have limited access to land. This is especially true for the 7.4 % landless hh who own 12.4% of buffaloes indicating dairying as an important source of income for such households. In spite of having high ownership of livestock by SMLL households, there are issues related to access to technology and information leading to suboptimal production performance of the animals, they own. Moreover, since most of the daily activities related to management of animals are taken care of by women, there is need for special emphasis to mainstream women of these categories of hh through capacity building, exposure visits and providing access to credit and technology for enhancing the production and productivity of livestock.

Table 2.7. Land and livestock ownership in India

Category of holdings	Land size	% hh	% areas owned	Av. no. owned per 1000 hh					
				Cattle	buffalo	sheep and goat	Pig	Total livestock	Poultry
Landless	≤ 0.002 ha	7.4	0.0	536	1050	527	0	2113	2357
Marginal	> 0.002 & ≤ 1.0 ha	75.4	29.8	1044	474	815	47	2380	2166
Small	> 1.0 & ≤ 2.0 ha	10.0	23.5	1702	873	909	92	3576	3397
Semi-medium	> 2.0 & ≤ 4.0 ha	5.0	22.1	1958	1320	992	69	4339	2979
Medium	> 4.0 & ≤ 10.0 ha	1.9	18.8	2663	1747	3627	26	8063	1878
Large	> 10.0 ha	0.2	5.8	4800	2653	2271	15	9739	570

*hh : household

Table 2.8 . Percent livestock owned by different categories of farmers

Category of holdings	Percent livestock owned					
	Cattle	Buffalo	Sheep and goat	Pig	Total livestock	Poultry
Landless	3.4	12.4	4.5	0.0	5.8	7.5
Marginal	68.1	57.0	70.8	72.9	66.5	70.0
Small	14.7	13.9	10.5	18.9	13.3	14.6
Semi-medium	8.5	10.5	5.7	7.1	8.0	6.4
Medium	4.4	5.3	7.9	1.0	5.7	1.5
Large	0.8	0.8	0.5	0.1	0.7	0.0
Total	100	100	100	100	100	100

2.1.7 Livelihood of rural women in different agro-climatic regions with different levels of participation in agriculture and allied sectors (2017-20)

Anil Kumar, Ananta Sarkar and J. Charles Jeeva

Agro-climatic region based planning in agriculture requires understanding not only the bio-physical characteristics of the region but also the socio-economic dimensions to understand the system as a whole. Distribution of female cultivators (F_cult) and female agricultural labourers (F_aglab) were analyzed in the 15 Agro-climatic regions identified by the Planning Commission (1989) for which district wise data were taken from Census 2011 for the 640 districts, classified and aggregated into the different agro-climatic regions (ACR). The data on female cultivators and female agricultural labours were presented as percent of total female population and percent of total female worker. The highest female agricultural workers (F_agw) as percent of population were in ACR 7 and 14, being more than 28 percent. A total of five ACR (7, 8, 9, 10, 14) had more than 20 percent F_agw and five ACR (3, 5, 6, 12 and 15) lower than 10 percent. Considering F_agw as percent of total worker, more than 80 percent were there in ACR 7 and 14.Similarly, as percent of population F_cult were highest (22.8) in Western dry region (ACR 14) followed by western hiamlayan region (17.4). F_cult were less than 5 percent in ACR 4, 5, 11, 12, 13 and 15, the lowest being 1.87 percent in the islands region. Female agricultural labour (F_aglab) was highest (19.24 percent) in Eastern plateau & hills region and lowest in the island region (0.5 percent). The distribution of F_cult and F_aglab across different districts of India as well as in the ACRs are depicted.

Table 2.9. Scenario of female agricultural workers, cultivators and ag. labourers in different Agro-climatic regions of India

ACR	Agro-climatic region	Percent of population			Percent of total worker
		F_cult	F_aglab	F_agw	F_agw
1	Western Himalayan Region	17.43	2.26	19.69	70.71
2	Eastern Himalayan Region	9.26	4.9	14.16	54.03
3	Lower Gangetic Plains Region	1.28	5.77	7.05	39.98
4	Middle Gangetic plains region	3.53	10.59	14.13	73.18
5	Upper Gangetic plains region	3.0	4.56	7.56	52.28
6	Trans-gangetic Plains Region	3.14	2.89	6.03	38.58
7	Eastern Plateau & Hills Region	9.35	19.24	28.59	80.39
8	Central Plateau & Hills Region	11.32	12.25	23.57	75.18
9	Western Plateau & Hills Region	11.85	15.69	27.54	79.73
10	Southern Plateau & Hills Region	6.38	16.9	23.28	65.54
11	East Coat Plains & Hills Region.	2.78	14.43	17.21	62.79
12	West Coast Plains & Ghats Region	2.06	3.54	5.6	25.9
13	Gujarat Plains & Hills Region	4.16	10.97	15.13	64.77
14	Western Dry Region	22.28	5.96	28.24	82.43
15	The Islands Region	1.87	0.5	2.36	14.08

F_cult : Female cultivator; F_aglab : Female ag. labourers; F_agw : Female ag worker

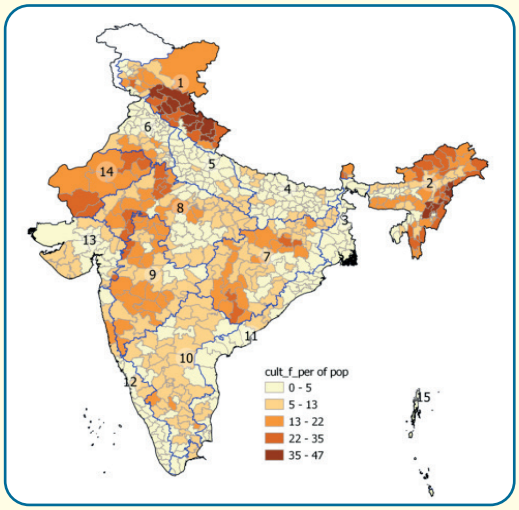


Fig 2.1.5 Distribution of female cultivators across districts in India

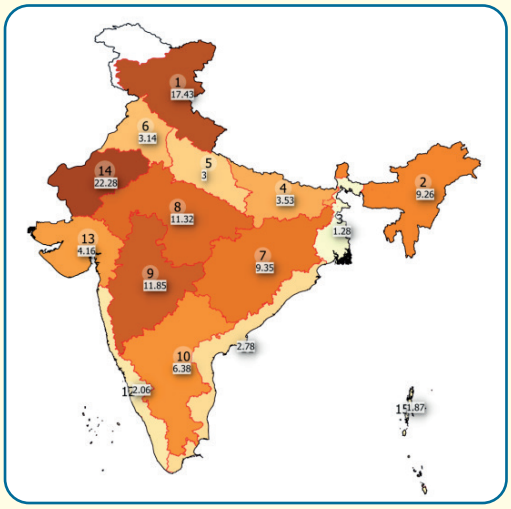


Fig 2.1.6 Distribution of female cultivators in 15 agro-climatic regions of India

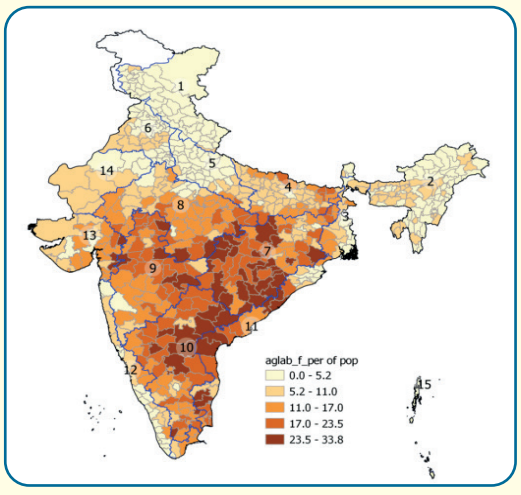


Fig 2.1.7. Distribution of female agricultural labourers across districts in India

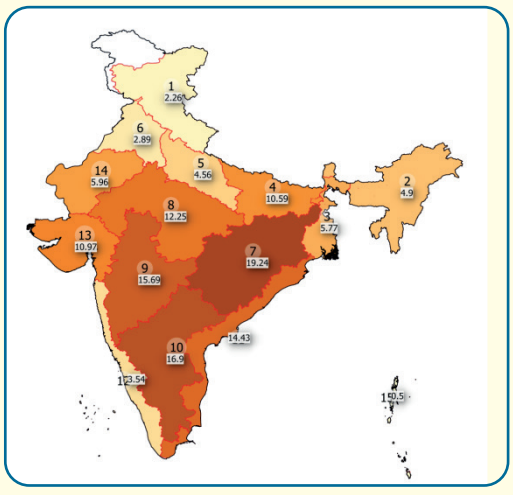


Fig 2.1.8. Distribution of female agricultural labourers in 15 agro-climatic regions of India

2.1.8 Studies on sectoral contribution of women in agriculture and allied sectors (2020-23)

Anil Kumar, Ananta Sarkar, Tanuja S. and Neetish Kumar

The economy of a country is mostly depended upon the quality of its workers. They are the change agents who bring vitality to any sector of economy. A skilled, motivated workforce is an asset to the nation. It is essential to know how many of them are there, the activity status of people, and the structural aspects of the workforce etc. to formulate enabling policies for strengthening economy as a whole. 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 status of employment can be assessed through the social construct i.e. employment, unemployment, underemployment, dependent population to understand the magnitude of the problem which is the primary steps in finding a solution for it. With a realistic picture of the above scenario, an assessment could be made to know the surplus workers and formulate policies to rehabilitate them in alternate remunerative vocation.

The exercise of counting workers was initiated with the first census conducted in 1872. Over the years there has been gradual improvement in approach towards collecting information on workers. Information on workers including those in agriculture is now collected through Census exercise every ten years and by National Sample Survey Organization (NSSO) every five years. Census exercise collects information on workers on a limited scale while the NSSO survey is a comprehensive exercise which collects entire gamut of work and workers. While census exercise is based on head count, the NSSO survey makes an estimate through proven methodology. The present exercise was undertaken to harmonize the various datasets, find equivalence between them, highlight their strength and weakness and present a real picture of the participation and contribution of women in agriculture. A comparison of the important points between census exercise and the NSSO survey is given in Table. Data related to the number of workers, non-workers and agricultural workers including cultivators and agricultural workers in rural and urban areas based on Census 2011 are given in Table. Similarly, the estimated number of workers, non-workers and those working in different sub-sectors of agriculture based on NSSO survey 68th round are given in Table.

Table 2.10. Comparison of Census and NSSO survey

Census data	NSSO survey
■ Workers in the population are counted through decennial census exercise.	■ Estimates of workers are made through comprehensive surveys on employment and unemployment by NSSO every five years. The latest being NSS 68th round (July 2011- June 2012) survey.
■ In census exercise: workers are further classified as main or marginal worker.	■ In NSSO survey : workers are further classified as principal status or subsidiary status worker
■ The census exercise: unemployed persons are not explicitly counted. They are subsumed under the category non-worker.	■ NSSO survey estimates the unemployed persons.
■ Census takes narrow definition of agriculture. It includes cultivators and agricultural labourers only.	■ It uses broad definition of agriculture. Agricultural workers are those engaged in agriculture (including animal husbandry), forestry and fishing. ■ Narrow definition of agriculture under NSSO can be derived from the detailed subclass of the estimates.
■ Does not contain comprehensive information of all sectors of employment.	■ A detailed exercise covering all sectors of employment and unemployment.

Table 2.11. Attributes related to female population, total workers and agricultural workers in India based on Census 2011 data (all figures in million)

Attributes	All female	Rural	Urban
Population	587.5 (100)	405.9 (100)	181.6 (100)
Workers	149.9 (25.5)	121.9 (30.0)	28.0 (15.4)
Non agri. workers	52.3 (8.9)	27.7 (6.8)	24.7 (13.6)
Agricultural workers			
Cultivators	36.0 (6.1)	35.2 (8.6)	0.9 (0.4)
Agri. Labourers	61.6 (10.4)	59.1 (14.5)	2.5 (1.3)
Agri workers (cult + agri labour)	97.6 (16.6)	94.3 (23.2)	3.4 (1.8)

*Figure in ( ) indicate percent of population within the column

Table 2.12. Estimated female workers and agricultural workers in different sectors of agriculture based on NSSO 68th round (2011-12) (population in million)

Attributes	All female	Rural	Urban
Population (Census 2011)	587.5 (100)	405.9 (100)	181.6 (100)
NSS 68th round survey			
Workers	128.9 (21.9)	100.8 (24.8)	26.6 (14.6)
Non ag workers	48.0 (8.2)	25.3 (6.2)	23.7 (13.1)
Ag workers in crop production, animal production, forestry and fishery			
Growing non-perennial crops and mixed farming	66.5 (11.3)	62.5 (15.4)	1.9 (1)
Growing of perennial crops	4.3 (0.7)	3.9 (1)	0.3 (0.2)
Animal production	9.9 (1.7)	8.9 (2.2)	0.7 (0.4)
Forestry	0.1 (0)	0.1 (0)	0 (0)
Fishing & aquaculture	0.2 (0)	0.1 (0)	0 (0)
Agriculture total (incl. crop, anim. prod, forestry and fishery)	80.9 (13.8)	75.6 (18.6)	2.9 (1.6)

*Figure in ( ) indicate percent of population within the column

2.1.9 Optimizing technological interventions with gender perspective in small scale mango orchards (2017-2020)

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

The project was designed with an objective of optimizing gender friendly technological interventions in small mango orchards. Among the horticultural crops, mango occupies a predominant area. Sustainable management of these orchards are integral in sustaining livelihood and nutrition of small and marginal farm families. The assessment of gender dynamics in small mango orchards helped in identifying and prioritizing the activities performed by both male and female farmers and amongst the existing constraints, poor profit from orchards during initial years of establishment, severe fruit drop, unfruitfulness in off year and reduced productivity from old orchards are some of the prevalent problems perceived and addressed by women farmers of the study locale: Baskitala and Harekrushnapur villages of Mayurbhanj districts of Odisha. As a result, some of the technologies for managing the severity of fruit drop, off-season floral induction, branch thinning and growth retardant application in inducing accelerated fruiting in mango were optimized and extended to the farm families in a participatory action research mode. In order to address the concern of poor productivity of juvenile orchards, sustainable intercropping models were optimized and demonstrated in farmers' field. The sustainability of the intercropping models was assessed on the basis of parameters viz., Environmental Conservation (EC), Permanent Asset Creation (PAC), Food Security (FS), Nutritional Security (NS), Input Recycling (IR), Employment Generation (EG), Annual Income Generation (IG). Amongst all the intercrops, pineapple proved promising with respect to Sustainability Livelihood Index (SLI) score. Partial Least Square Regression analysis was worked out to assess the degree of relationship between dependable variables (Adoption, women friendliness and commercial significance score) and explanatory variable (SLI parameters). Pineapple corroborated a significant correlation with SLI parameters and manifested a higher adoption, women friendliness and commercial significance score. The parameter Input Recycling exhibited low correlation. The VIP chart indicated that Income Generation (IG) is the highly influential explanatory variable.

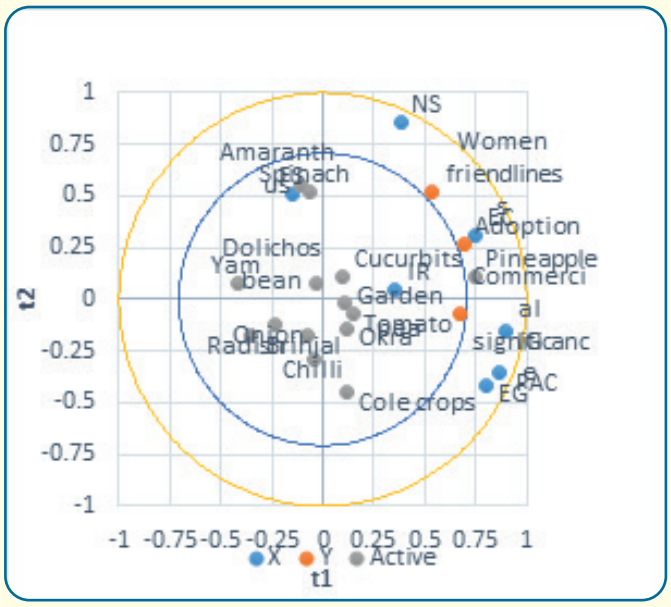


Fig 2.1.9 Correlations on axes t1 and t2

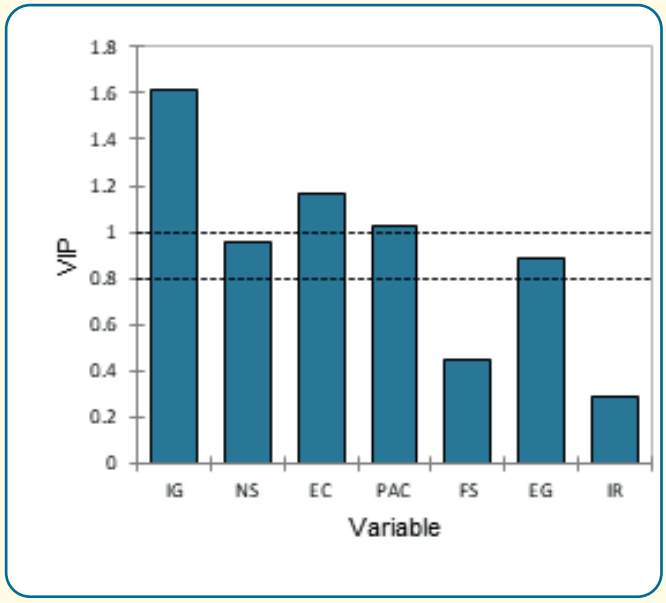


Fig 2.1.10 VIPs (1 Comp / 95% conf. interval)

Fruit crop diversification was initiated by supplying planting material of a new fruit crop (dragon fruit) in the region. Impact assessment of the interventions/ technologies popularized were done through pre and post project surveys through assessment of gain in knowledge and extent of adoption of technologies among women farmers. Amongst several technologies imparted, the women farmers exhibited a considerable gain in knowledge in pruning of mango trees and application of recommended fertilizer doses, followed by awareness on improved mango cultivars and micronutrient application for obtaining a quality crop.

Studies on extent of adoption of technologies indicated a profound adoption of improved varieties over conventional varieties. The major implications of the project are documentation of existing scenario of gender dynamics in small mango orchards; popularisation of nursery raising as an alternate source of livelihood for farm families; identification of gender amenable technologies in small mango orchards and capacity building and skill development of farm women in nursery raising and improved production technologies of mango.

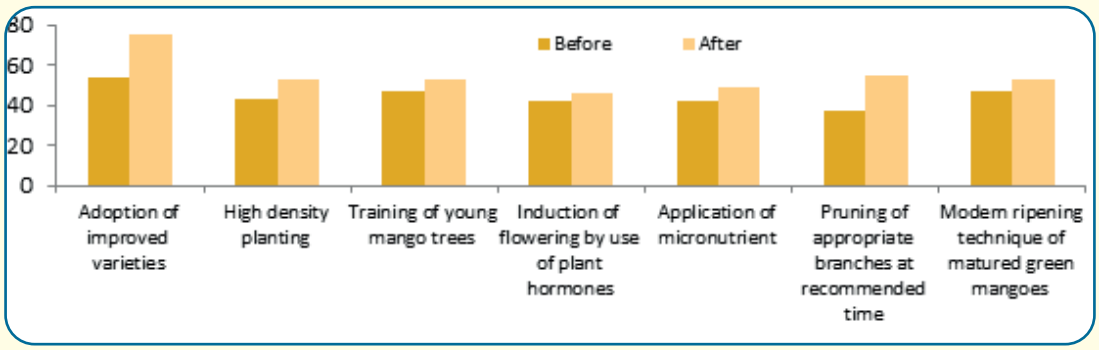


Fig. 2.1.11. Adoption index of improved production technologies (n=55)

2.1.10 Livelihood improvement of tribal farm women through secondary agriculture (2017-20)

Gayatri Moharana, Jyoti Nayak, Ankita Sahu and Lipi Das

This study was aimed at 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 in tribal areas. A SHG consisting of 20 women in Ganjam district was formed and named in 'Basudha'. The group has been started preparation of ragi flour, ragi laddo, ragi cake and were selling in the nearby local markets. For increasing selling quantity of fruits such as mangoes after harvesting, they have started adopting hot water treatment to improve shelf life of good quality mangoes for getting better values. Efforts made for commercialization/ transfer of technologies and for establishing household millets based enterprises by making millet based value added products.

Preparation of value added product by SHG

Value added ragi product- ladoo

Initiative for Inclusive Agricultural Business Models by Techno Serve (2017), Coca-Cola Company Model, The Kellogg Company Model and Promoting Rice value addition through Inclusive Business Models (University of Thailand, 2018) were studied. It was found that the adoptions of Coca-Cola's SAGPs may help in improving smallholder livelihoods and reduce their vulnerability through improved social, environmental and economic sustainability. This model makes focus on farming as a business to both male and female farmers through Farmer Field Schools. A schematic model has been prepared by considering the stakeholders who are directly linked with the tribal women. The income of tribal women increased through suitable intervention of technologies and increased their access to different facilities. It was evaluated by considering the feedback taken from stakeholders at stages. It helped tribal women in enhancing their knowledge and skilled required for preservation and value addition of fruits, vegetables and millets. It was increase in income through selling of value added products and increased their access to different facilities such as getting inputs, trainings, marketing etc. Though the income of tribal women increased through suitable intervention of technologies but for sustainability of model, it requires continuous monitoring and evaluation through feedback. Accordingly the schematic model was revised and can be replicated among different groups for further replications.

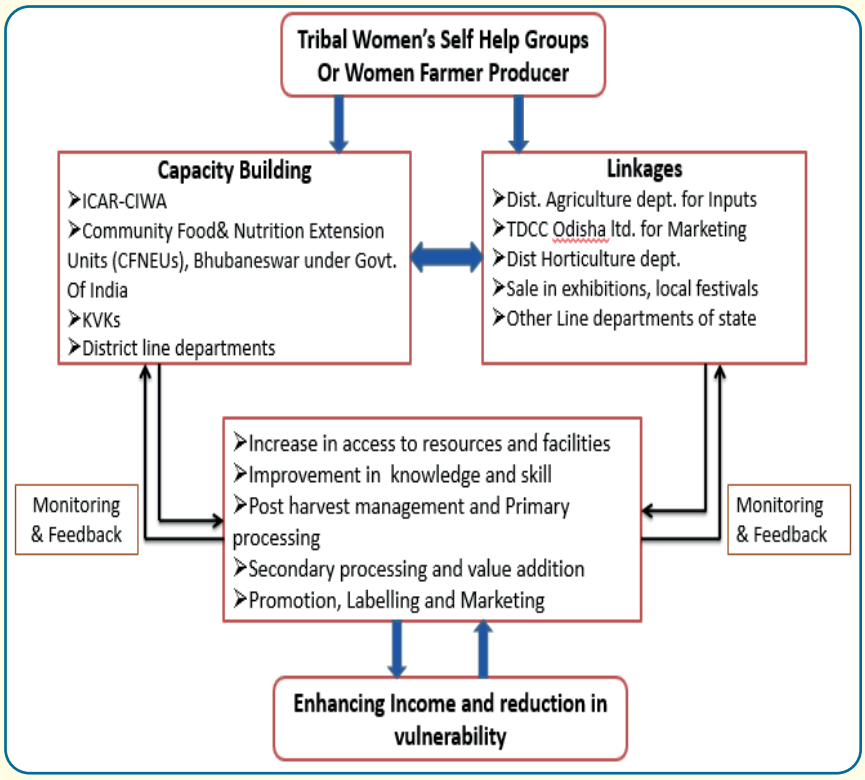


Fig 2.1.12 Schematic model for establishing small scale agro-based enterprise

It was inferred that introducing women friendly technologies for post-harvest management and value addition reduce post-harvest loss of vegetables, fruits and also other commodities. Skill based capacity building of tribal women along with exposure of institutional supports and market linkages enable farm women strengthening their participation in secondary agriculture and enhanced income. Micro agro enterprises based on secondary agriculture can be established by forming small groups of women. The works should be done systematically, linkage may be established for essential support for financing and marketing and the activities performed by tribal women needs to be monitored and evaluated in a specific time interval through feedback for betterment of their livelihood status.

2.1.11 Integrating gender dimensions for improvement of livelihood through empowerment (2020-23)

Sabita Mishra and Anil Kumar

Under the project, ten agro-ecological-regions are identified under pan India mode. A semi-structured interview schedule has been developed as data collection tool. Livelihood has been characterized based on three components like: 1) increase in income, 2) access to resource 3) reduce vulnerability. For action research, two clusters are identified under Kanas and Nimapara block of Puri district. About 500 hundred farm women of Nimapara are motivated and organized from six Panchayats like: Taraboi, Kothakusang, Uchhupur, Pipili, Balanga and Gopinathpur. Similarly, about 200 farm women are organized in Kanas block covering five villages such as: Lokapal, Dholapatna, Haladiapada, Jaguleipadar and Chhotijodi. The gender dimensions were identified and framework was developed. To create awareness, one virtual webinar was organized on "Farmers Producer Organization in Livelihood Enhancement of Farm Women" on 18 November, 2020. About 95 farm women/ farmers attended the programme through Zoom and Youtube link from different corners of rural Odisha.

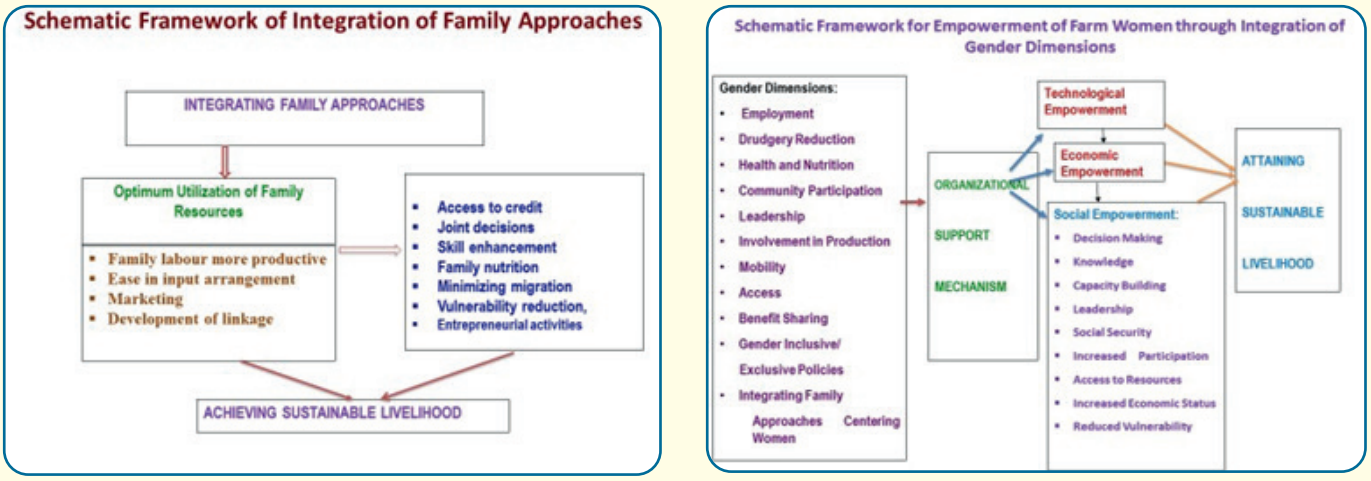


Fig 2.1.13 Gender integration models

2.1.12 Design and development of gender sensitive integrated vertical nutri-farming system (IVNFS) for household nutrition and income (2020-2023)

Tania Seth, Arun Kumar Panda and Chaitrali S. Mhatre

Vegetables are the essential part of balanced diet, rich source of micronutrient and nutraceutical compounds. The recommended daily-diet allowance (RDA) of vegetables (300 g/person/day) could not able to be met by growing extensively by horizontal cultivation alone due to the ever increasing population in the country. Hence, alternate technology of vegetable cultivation is crucial to adopt and get self-sufficiency of RDA of vegetables. Vertical farming is practiced for growing of plants in vertically stacked layers. The ultimate production from vertical farm is more as the growing area is increased many fold. Keeping this in view, the project has been envisaged to design and develop a gender friendly integrated vertical nutri-farming system (IVNFS) for growing of year round nutritious vegetables along with poultry farming and/ or mushroom cultivation and to study the impact of integrated vertical nutri-farming system on household production, nutrition and income. Mushroom is a rich source of protein, vitamins, minerals, folic acid, iron and is the only vegetarian source of vitamin D. Mushroom cultivation is a women friendly low cost enterprise which requires little infrastructure, space and money. Poultry farming needs the minimal input cost and least space but produces the major amount of meat requirement on farming standards. Women

plays an important role in backyard poultry production and promoting it will lead to gender balance in rural areas. The gender friendly integrated vertical nutri-farming system (IVNFS) model is a low-cost triangular shape structure made up of iron which is carried out under outdoor condition. The system comprises of two components for vertical cultivation of nutritious vegetables throughout the year and poultry farming and/or mushroom cultivation in an integrated approach in the space of the triangular structure. A total of six number of troughs on both sides of the structure will be utilized for year round vegetable cultivation in the vertical space and the in between space will be utilized for rearing of dual purposes (egg laying and meat both) breed of poultry birds and/or mushroom cultivation. The length of the IVNFS is 14.0 ft (4.27 m), width is 6.5 ft (1.98 m) and height is 7.0 ft (2.13 m). The height of the vegetable troughs is made keeping in view the average height of women so that women farmer can easily perform all the cultural and intercultural operations easily. This structure use soil or soilless growing medium for cultivation of vegetables. Therefore, integrated vertical nutri-farming system (IVNFS) is an innovative approach to the landless women farmers for ensuring dietary diversity and nutritional security from a small area around the homestead backyard; it will also help in improved participation of women, year round food security and nutritional benefits and ultimately provide a subsidiary source of income to the women farmers.

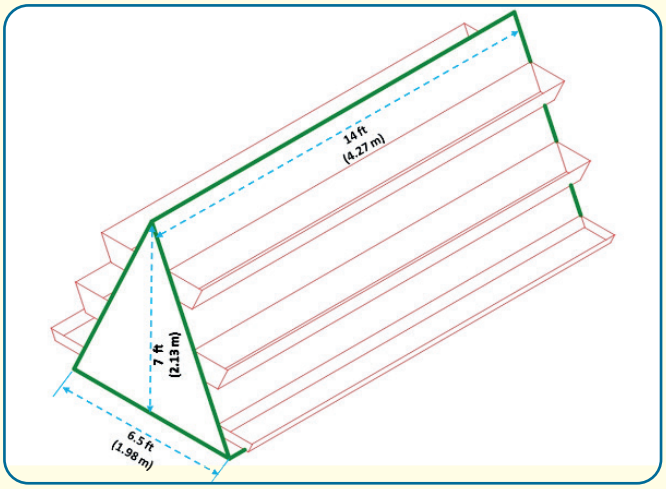


Fig. 2.1.14 Schematic diagram of gender friendly integrated vertical nutri-farming system (IVNFS)

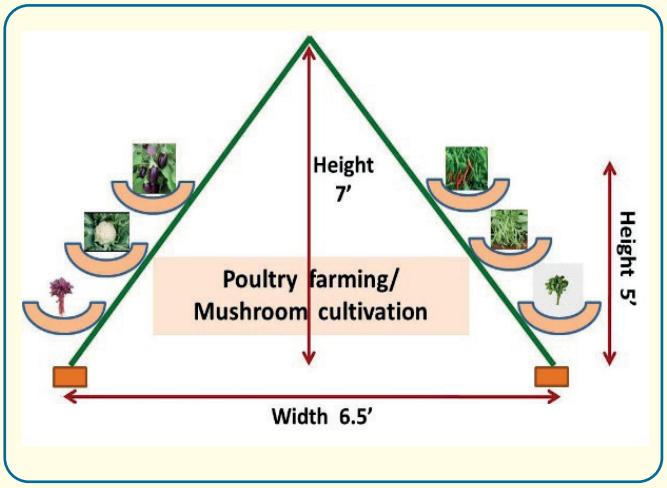


Fig. 2.1.15 Schematic diagram of side view of gender friendly integrated vertical nutri-farming system

2.1.13 Status of women in peri-urban dairy farming: Mainstreaming their role for enhancing income and productivity (2017-2020)

Biswanath Sahoo, Anil Kumar, Arun Kumar Panda and Lipi Das

The study was designed to assess the effect of supplemental mineral mixture along with the conventional diet on nutrient utilization, mineral bioavailability and milk production performance in lactating cows and change in perceived attitude along with adoption rate of this technology by farm women. A field study was conducted at farmers' field in Jagatsinghpur to assess the effect of mineral mixture supplementation in conventional feeding on the production and reproductive performance of crossbred cows. Forty crossbred milch cows were randomly divided into 2 groups (C control and T treatment) of 20 each based on milk yield (7.5±0.25 kg) and parity. Animals were fed on homemade concentrate mixture comprising locally available maize, soybean cake, rice bran. Paddy straw provided *ad libitum* to the animals satisfying the nutrient requirement. Animals in treated group were additionally supplemented with a commercial grade mineral mixture @ 70g/cow/day with concentrate mixture. It was observed that average daily milk yield, peak yield and total milk production were higher (P≤0.05) by 14.5%, 16.8% and 13.7% in mineral mixture fed group than control. 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. It was inferred that consistent feeding of supplemental mineral mixture economically improved performance of dairy cross bred cows in lactation and reproductive performance.

Another study (3 month) was conducted at farmers' field in Jagannath Vihar, Bhubaneswar, Khorda in coastal belt of Odisha. Twenty milch crossbred cows were randomly divided into 2 groups (T_1 control and T_2 treatment) of 10 each based on body weight (500 ± 15.50 kg) and milk yield (7.5±0.25 kg). Animals were fed on homemade concentrate mixture comprising

locally available maize, soybean cake, rice bran. Paddy straw provided *ad libitum* to the animals satisfying the nutrient requirement. Animals in group T_2 were additionally supplemented with a commercial grade mineral mixture @ 2% in concentrate mixture. A digestibility trial of 6 days was conducted at the end of the experiment. Daily intake was similar in both the treatments. The digestibility of crude protein and fat was higher (P<0.05) in mineral supplemented group of animals resulting better availability of nutrients to animals.

Table 2. 13. Effect of mineral mixture on feed intake and Digestibility (%) of nutrients in dairy cows

Attributes	T_1	T_2	SEM	P value
DM Intake (kg/day)				
Concentrate	4.55	4.61	0.55	1.05
Roughage	6.82	6.97	0.75	0.65
Total DM Intake	11.37	11.58	0.68	0.78
Digestibility coefficient (%)				
Dry matter	60.44	62.22	1.81	0.79
Organic matter	62.10	61.05	1.79	0.72
Crude protein*	59.91 [a]	62.64 [b]	0.58	0.04
Ether extract*	62.30 [a]	64.23 [b]	1.26	0.05
Neutral detergent fibre	60.04	62.31	1.75	0.50
Acid detergent fibre	55.03	56.34	1.62	0.45
Total carbohydrates	56.89	59.52	1.93	0.71
Economics of feeding				
Total feed cost (Rs./d)	116	123	0.19	0.24
Total income (Rs./d)*	211	247	0.55	0.05
Net return over feed cost* (Rs./d)	95	124	0.85	0.04
Feed cost/kg FCM yield (Rs.)*	13.5	12.1	0.82	0.05

Milk yield, FCM yield and milk composition were higher (P<0.05) in mineral supplemented group. Milk yield and 4% FCM yield were higher by 18% and 26%, respectively, following mineral mixture supplementation in cows. The milk constituents *viz.* fat, SNF and TS were also increased by mineral supplementation. The economics of feeding supplemental mineral mixture revealed that net return over feed cost was 30.5% more than control. Feed efficiency was improved by 11.5% in T_2 indicating beneficial effect of mineral mixture supplementation in dairy cows which enhanced the income of farm women

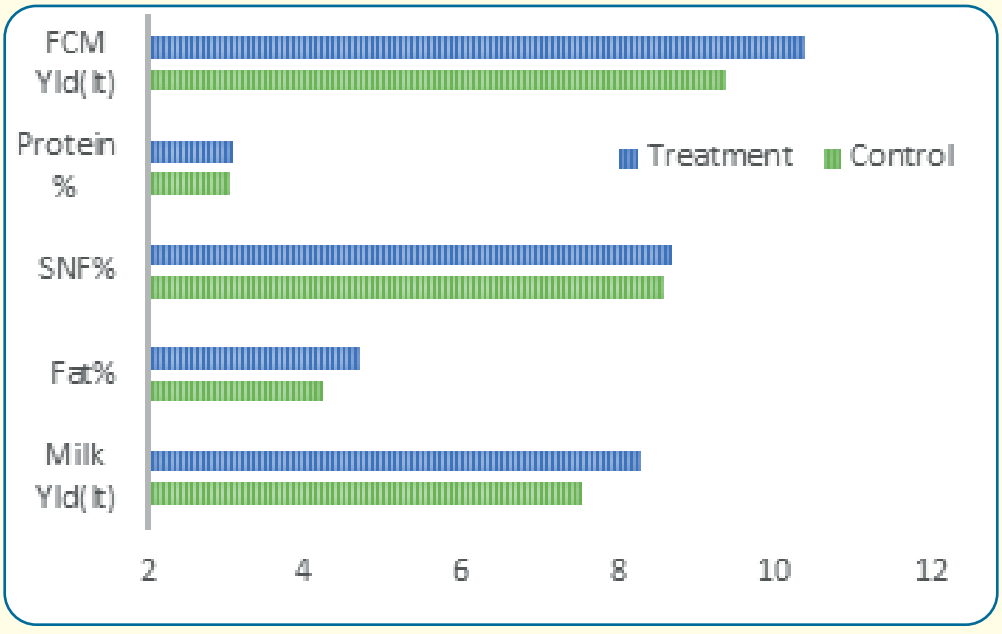
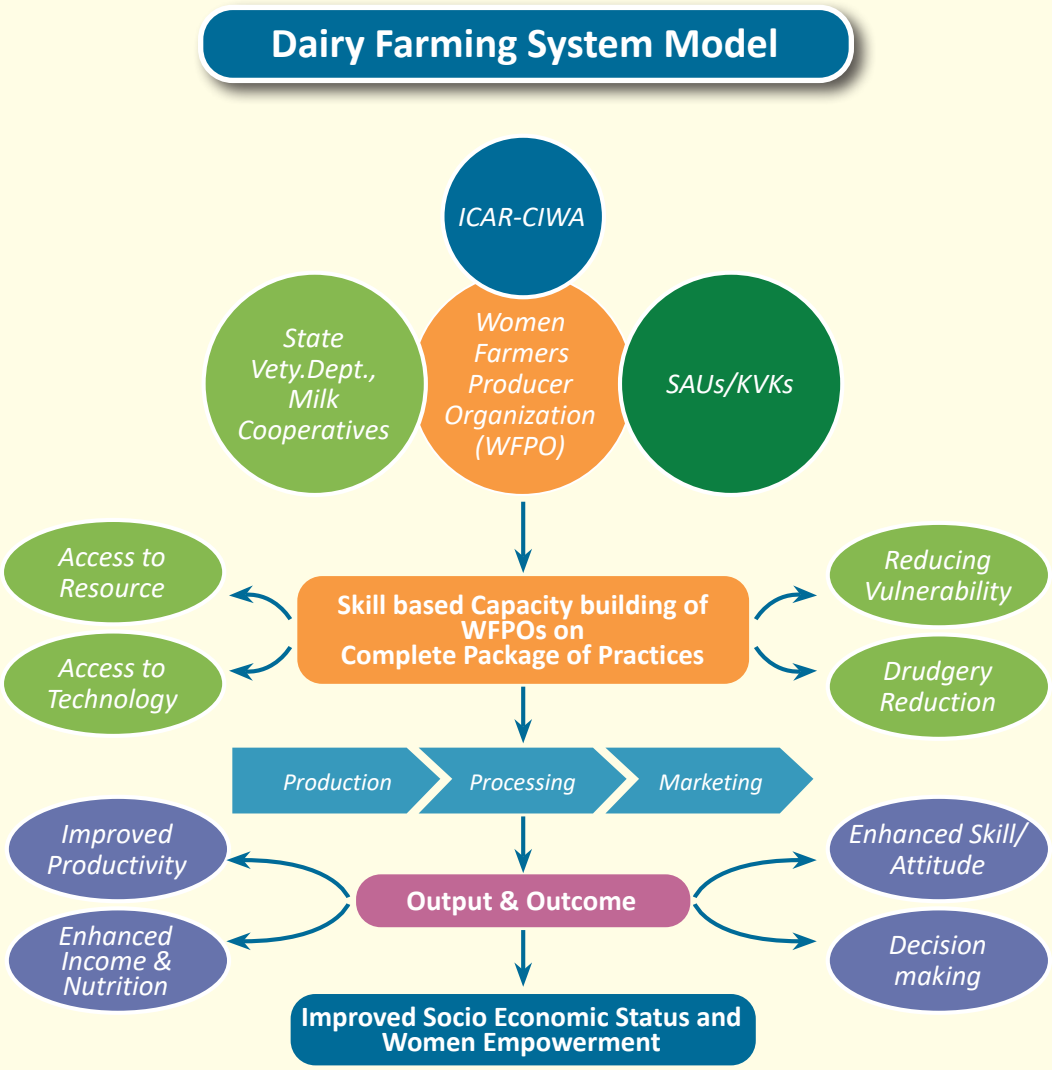


Fig 2.1.16 Effect of feeding balanced on different parameters

Effect on perceived attitude of women on improved feeding and management practices

The awareness on feeding of balanced ration incorporated with mineral mixture was developed among the farm women engaged in peri urban dairy farming through skill based capacity development programme. The feedback collected from farm women was analysed and it was observed that training needs of dairy farm women was highest followed by maintenance of cattle shed, animal health and disease control, milk production, animal hygiene and management, common diseases of milking animals, vaccination schedule and conservation of fodder in descending order. Majority of dairy farm women (70%) perceived that knowledge about balanced feeding and feeding of lactating and advanced pregnant animals was the most important activity to be undertaken by farm women. An impact study of training was analysed shows that the change in knowledge level among the trained group of dairy farm women in case of breeding practices was highest from 45 to 70% followed by feeding practices from 70 to 90%; management practices 55 to 85%; health care 40 to 60% and milk products preparation 27 to 48%, respectively.

It was concluded that the socioeconomic status of farm women engaged in peri urban dairying was improved by adoption of integrated bankable model and comprehensive package of practices in dairy farming. The adoption rate of different technologies was found to be 55% for feeding of homemade balanced ration with mineral mixture and salt, 60% for cultivation of perennial fodder (Sugar cane, Yashwant, HNCo-4, IGFRI-6). The daily milk yield and FCM yield was augmented by 14-16% & 18-20%, respectively in lactating CB cows with improved net return over feed cost (25-30%). The reproductive efficiency was also improved by higher conception rate, less incidence of dystokia, abortion and infertility problems (25-30%). A Dairy farming system model was developed.



2.1.14 Gender Inclusive Homestead Aquaculture for enhancing household fish consumption and income (2017-2020)

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

The project was undertaken with the participation of rural women in four villages of Satyabadi block, Puri District with an objective to popularise the technology of Polyculture of Indian major carps with small indigenous fishes in homestead ponds and thereby to improve household fish consumption and income. A total production of 2.31 tonnes/ha (1.75 tonnes of IMC and 0.56 tonnes of SIFFS was realized with a net profit of 1.21Lakh/ha from the sale of IMC. Although the second crop was stocked in August 2018, the farmers suffered a huge loss of the stock because of the cyclone 'Fani" which struck Odisha on 3rd May 2019. The farmers were provided with advanced fish fingerlings (7500 nos) in the month of January 2020. Three tonnes of floating fish feed was distributed among the farmers. The subsequent harvesting was done in November 2020 wherein they could get a yield of only 624kg/ha. Ninety six kilograms of small indigenous fishes were harvested during the final harvest of IMC which was sold @ Rs 110/ kg. Awareness on importance of equitable distribution of food in family and awareness on the importance of working together in a team were created through role play among women farmers during the occasion of National Science Day on 28th February 2020. A gender sensitive training module on homestead integrated aquaculture is being prepared which can serve as a guide for extension functionaries and researchers involved in rural aquaculture involving women. Mobile based advisories regarding aquaculture management, emerging technologies and government schemes were given to the homestead aquaculture farmers through the whatsapp group "Homestead Aquaculture".

Gill net operation by homestead pond owners

Role play by farm women on equiTable distribution

2.1.15 Promoting gender equity through family poultry production (2016-2020)

Arun Kumar Panda and B. Sahoo

Poultry represent an important system to feed the fast growing human population of developing countries like India and to provide income to poor small farmers, especially women. Rural poultry production has been broadly considered as a quickest way to ensure food security, generate employment and income, and promote women's empowerment at a relatively low investment. The project was implemented with the objective of 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. In the first phase, household surveys of farm women were conducted through a structured interview scheduled to study the existing production system and constraints faced by them. In the second phase, an action research was conducted with farm women to evolve a suitable model for family poultry production. Training and exposure visit is considered as very critical inputs for women empowerment. During awareness campaign farm women were explained about the advantages rearing of improved varieties of chicken compared to Desi variety. On farm and off farm trainings were conducted on various aspects of poultry production such as handling of birds, preparation of suitable house, supplementary feeding, identification of sick bird, vaccination, record keeping etc. Exposure visit was also made to the Poultry demonstration Unit of ICAR-CIWA and Central Poultry Development Organization, Bhubaneswar. Leaflets and pamphlets were also distributed to them, which explains about the package of practices to be followed. A total of

1200, four weeks straight run chicks of dual purpose coloured Vanaraja were distributed to 40 selected farm women in two phases in Chanrapada and Denuabasta Nimapada block of Puri district of Odisha. 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. Supplementary feed made from household resources were provided to the birds as and when required. The effect of supplementary feeding on performance of Vanaraja laying hens in field condition is given in Table.

Table 2.14. Performance of Vanaraja hens in Field condition

Attributes	Supplementary Feeding	
	No	Yes (35 g/day)
No of birds reared	160	160
Age at first egg	168	162
Egg weight, 32 wks	51.90	52.40
Egg weight, 40 wks	54.80	55.60
Egg weight, 48 wks	55.60	56.20
Egg production, 48 wks	69	91
Mortality (%)	3.0	2.0
Income/birds (Rs.)	690	910
Supplementary Feed cost (Rs.)	--------	137
Net profit/bird (Rs.)	690	773

The impact of family poultry production (FPP) on household income, food and nutrition security, and women empowerment was studied through focused group discussion. The FPP has increased average net income of Rs. 750-800/household. If home consumption of poultry meat and eggs are accounted, net income per house hold ranges from Rs. 600-650/month. Higher net income was attributed to the fact that the meat and eggs were sold at premium price (poultry meat @ Rs. 300/kg &Rs. 10/egg). The study revealed that 25% of egg produced was consumed as a source of nutritious food. It was further revealed that poultry keeping provide an opportunity to ensure that eggs and to some extent meat became an integral part of their family diet. The FPP had also a significant impact on empowering women as the income earned was controlled by them and often making intra household decisions. They played an important role in marketing of eggs and chicken at their doorstep. Although income in terms of monetary return was not so high, yet women continue to keep it up as income influences their socio-economic position in the society. Increasing income of women through improved poultry productions therefore increase their social status. Rearing of improved varieties of bird encouraged farm women to become more market oriented and entrepreneurial in their attitude. A family poultry production model was also developed and is worthy for its replication at large scale as women with minimum effort can maintain the small poultry flock that enhanced their livelihoods, provided higher economic returns as well as facilitated empowerment. Training and exposure visit was considered as very critical to make family poultry rearing a great success.

Beneficiaries of family poultry farming

2.1.16 Enhancing income of rural Women through Improved Goat Rearing (2016-2020)

Biswanath Sahoo, Anil Kumar, Arun Kumar Panda, Sabita Mishra and Jyoti Nayak

An *in vivo* study was undertaken to assess the effect of proteinaceous diet along with mineral mixture on nutrient utilization, mineral bioavailability and growth performance of Black Bengal goats under semi intensive system of rearing at experimental farm, ICAR-CIWA. Eighteen doe (6-7 month age) were randomly divided into 3 groups and fed different type of diets i.e T_1 (control) (conventional/farmers' practice (low protein and low mineral), T_2, protein-based diet (high protein and low mineral) and T_3, (high protein and high mineral) (mineral mixture @3% of concentrate mixture). Fodder (hybrid napier) was provided to the animals as per requirement daily basis with concentrate and roughage ratio (40:60) level. The feed intake was higher in T_3 than T_1 and T_2 which were similar, showing efficacy of mineral mixture supplementation with protein diet in goats. Dry matter digestibility (%) in T_3 (61.50) was higher (P<0.05) than T_1 (54.75) and T_2 (57.75). The digestible coefficient of nutrients (protein, carbohydrate and fat) in T_3 was found to be higher (P<0.05) than T_1 and T_2 showing better impact of mineral and protein on animals. The intake, absorption of mineral (Ca, P, Zn, Cu, Fe, Mn) was higher (P<0.05) in T_3 than T_1 and T_2. The biochemical indices (Hb, glucose, protein) of experimental goats in T_2 and T_3 were higher (P<0.05) than T_1. Similarly, serum minerals level was also found to be higher (P<0.05) in T_3 than T_1 and at par with T_2. Data in Table revealed that total body weight gain (kg) for 90 days trial was significantly higher (P<0.05) in T_3 (5.37) than in T_1 (3.31) and T_2 (4.39). Similarly, growth rate (g/day) was also higher (P<0.05) in T_3 (63.94) than T_1 (39.40) and T_2 (52.32). Feed gain ratio (DMI/unit body weight gain) was comparatively better (P<0.05) in T_3 (6.63) than T_1 (9.96) and T_2 (7.89) at par with T_2.

Growth performance was higher (P<0.05) in mineral supplemented animals showing synergistic effect of protein with mineral due to better nutrient utilization at tissue level. The cost benefit analysis revealed that Black Bengal goats fed protein rich concentrate mixture with mineral mixture is comparatively better than other two groups. The income generated from selling price of goats and net profit was increased by 46.11 and 85.62% in T_2 and T_3 than control. The growth rate and feed efficiency were improved in T_3 than T_1 and T_2 group of animals. It was concluded that supplementation of protein with mineral mixture in goats showed better nutrient digestibility, blood biochemical and mineral profile which was reflected in enhanced productive performance of goats.

Table 2.15. Growth rate and voluntary feed intake by goats

Attributes	T_1	T_2	T_3	SEM	P value
	Growth rate				
Body wt (kg) Initial	7.20	7.19	7.20	0.64	1.10
Final	10.50^a	11.58^b	12.57^c	0.21	0.04
Total gain (kg)	3.31^a	4.39^b	5.37^c	0.20	0.03
Growth rate (g d^{-1})	39.40^a	52.32^b	63.94^c	2.45	0.03
Voluntary feed intake					
Concentrate (g d^{-1})	158.1^a	166.5^b	172.8^b	1.75	0.02
Roughage (g d^{-1})	234.4^a	246.5^b	251.2^b	2.20	0.03
Total DMI (g d^{-1})	392.7^a	413.0^b	424.2^b	3.92	0.03
Feed gain ratio	9.96^b	7.89^{ab}	6.63^a	0.75	0.02
Concentrate: roughage	37:63	40:60	41:59		

^{a,b,c}Means with different superscripts in a row differ significantly (P<0.05).

Another trial was conducted on twelve male kids (4-5 month age) randomly divided in to 3 groups of 4 in each based on body weight at institute Goat farm. Three types of diets containing T_1- conventional/ farmers' practice (CM-I: low protein and low mineral), T_2- T1 +mineral (CM-II: low protein and high mineral) and T_3- T_2+ protein rich oil cake based feed (CM-III: high mineral and high protein) was provided to goats to validate its effect on growth performance, nutrient utilization and blood biochemical profile. The study revealed that growth performance (g/day) was higher (P<0.05) in protein feed supplemented animals along with mineral fortified feed (T_3, 59.12) than T_2(45.23) and T_1(34.45) showing synergistic effect of protein with

mineral. However, supplementation of mineral mixture with low protein diet did not influence growth rate. The recommended level of mineral and protein was made into a solidified mixture in form of urea molasses mineral block (UMMB) as alternative supplement which stimulate microbial activity in the rumen, thus improve digestion of low quality roughages in goats. The block was supplemented @100g/animal with the conventional diet consisting of concentrate mixture and fodder per goat. It was revealed that supplementing UMMB in diet improved growth rate by 45% and feed efficiency by 40% reducing wastage of feed by goats. The complete package of practice was popularized in Ganjam and Khurda district of Odisha. It was assessed that about 50% of farm women adopted the improved goat farming practices on feeding, breeding and housing management techniques. Four women dairy scouts/ entrepreneurs, two in each district were selected and trained to popularize the technologies among farm women on improved goat rearing in rural areas. An improved goat farming system model was developed for women empowerment.

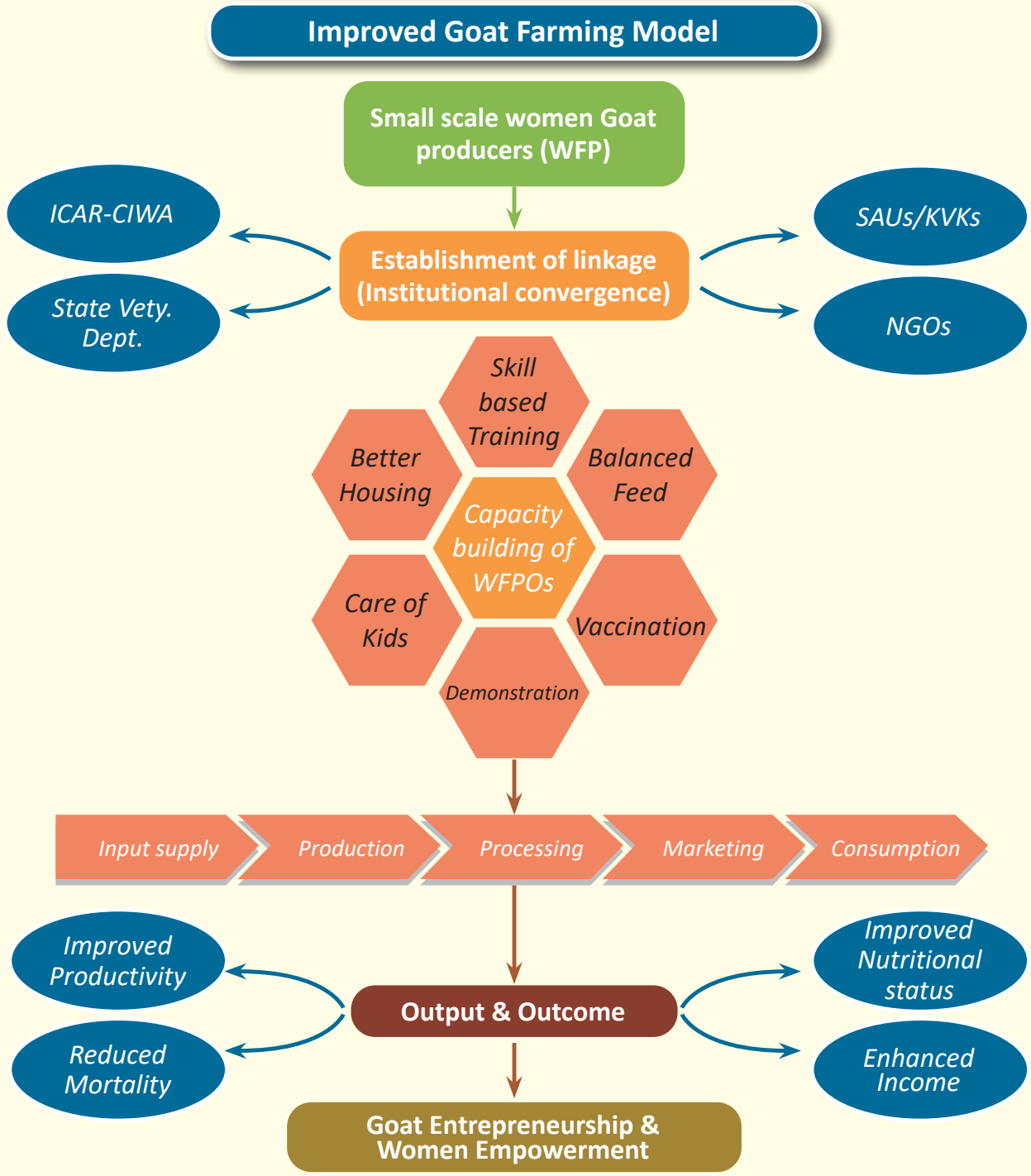


Fig 2.1.18 Schematic model for establishing small scale goat-based enterprise

2.1.17 Development of women entrepreneurship in livestock and fisheries sector for promoting gender equity and strengthening livelihood (2020-2023)

Tanuja S., Arun Kumar Panda, Lipi Das and Biswanath Sahoo

The role of agro-enterprise or small and medium enterprises in poverty alleviation has long been recognized as vital, and promotion of small and microenterprises for women has been realized as a key factor augmenting family welfare. Scientific understanding and approach towards entrepreneurship development is needed towards sustainable rural enterprise development. Up scalable entrepreneurship models for rural women pertaining to small scale poultry, livestock and value addition of fish is a need of the hour. Hence the project was initiated with the following objectives, 1) To develop small scale entrepreneurship models in backyard poultry farming, small ruminant farming and value added fish products 2) To facilitate setting up of enterprises by rural women integrating forward and backward linkages 3) To study the impact of established entrepreneurship on productivity, income flow and household nutrition

Component 1: Women entrepreneurship development through small scale poultry production

Semi structured interview schedule for baseline data collection (socioeconomic profile, existing poultry production system, constraints faced by farm women for entrepreneurship development, etc.) has been developed. Five villages in Hindol block of Dhenkanal District, Odisha has been selected for baseline survey of 100 respondents. Two best poultry germplasms, Vanraja and Kadaknath has been identified for small scale poultry production for undertaking rural enterprise development

Component 2: Women entrepreneurship development through improved goat farming

The information on role of women in existing goat farming system, constraints faced by farm women for entrepreneurship development in goat farming was collected through sample survey of goat keepers engaged in goat rearing (sample size -50) in 5 coastal districts of Odisha (Cuttack, Dhenkanal, Jagantsinghpur, Jajpur and Ganjam). Availability of superior breeding buck was found to be a common problem in farmers's field. A model goat farm in ICAR-CIWA was established. Broiler goat rearing, a women friendly technology covering timely weaning and proper care on improved feeding and management and health care was adopted in this model.

Component 3: Entrepreneurship development among rural women through value addition of fish

Two blocks and 4 villages and 12 SHG groups from 2 districts of Puri and Khordha has been identified for baseline survey of minimum 150 respondents and for selection of master trainers and producer groups. The products finalized for preparation protocol standardization and development of women led enterprises are a) Fermented product-fish pickle, prawn pickle, b) Dry Cured product-solar dried fish/prawn, c) Ready to eat snack-Prawn sev, d) Ready to cook snack-Fish papad. The criteria for selection of these products were a) Shelf life, b) Nutritional value, c) Availability of raw material, d) Marketability and e) Ease of preparation. Dried fish/prawn has s huge demand in Odisha. As a part of the protocol standardization of dry cured prawn, hygienic solar drying of prawns were done and the mineral composition of solar dried prawn was estimated.

Table 2.16. Concentration of macro and micronutrients in solar dried prawn

	P(%)	K (%)	Ca (%)	Mg (%)	Fe (ppm)	Cu (ppm)	Zinc (ppm)	Mn (ppm)
Solar dried prawn	1.866	0.138	3.525	0.729	373.2	206.3	61.8	27

2.1.18 Entrepreneurship development among rural women through value addition and product diversification of food crops (2020-23)

Sachidananda Swain, Lipi Das, Jyoti Nayak and Tania Seth

The project is conceived to empower rural women in different districts of Odisha by promoting entrepreneurship and participatory technology development at village cluster level through value addition of marketable surplus. Eight districts covering eleven blocks were selected for entrepreneurship development programme. During the first year of the project, following progress and achievements has been made:

Women appraisal on post-harvest processing of produce : RBQ approach

A survey was conducted in R. Udayagiri block of Gajapati district to study post-harvest constraints faced by women for their food crops viz. as mango, pine apple, bael and tomato. Out of 251 revenue villages, only 14 villages were selected based on fruits and vegetables production. The rank based quotient (RBQ) was calculated for each problem and it ranged from 22.14 to 95.75. The highest RBQ value correspond to the problem

namely lack of cold storage (95.75) followed by lack of access to credit (88.27) and Inappropriate handling and poor packaging(80.65). Moreover, the problems like insufficient working capital (77.42), low govt. Support (74.93) and poor transportation network (64.52) are found to be contributory factors for inadequacy in post-harvest management and value addition process. On the basis of problems identified different solution modules will be developed as per the objectives of the project.

Table 2.17. Post-harvest constraints

Post-harvest constraint	RBQ value	Rank
Lack of cold storage	95.75	I
Long distance to market	61.44	VII
Poor transport network	64.52	VI
High labour cost	36.07	X
Pest and diseases	49.56	IX
Lack of access to credit	88.27	II
Insufficient working capital	77.42	IV
Low govt. support	74.93	V
Theft	22.14	XI
Inappropriate handling and poor packaging	80.65	III
Poor quality of produce	56.60	VIII

Development of vacuum dried mango powder

In this year, mature green mangoes were purchased from ICAR-CIWA farm production unit. The fruits were washed thoroughly and trimmed to remove the stem and blossom ends. The fruits were peeled, cut into 2-3 mm thin chip. 250g of chips were placed in trays (1.5 cm thick layer) and dried in a vacuum oven operated at 65°C at 600 mm Hg vacuum pressure. Then the dried chips were powdered using laboratory blender for 3 min followed by storage in plastic airtight containers. For comparison of saving in drying time, sampler were dried under hot air oven at 65°C. At every 2h, the loss of moisture was measured and samples were kept drying until the moisture content of previous reading was within ±1% change of successive reading.

Empirical modelling of drying curves

To determine the most suitable drying model, the drying cures were fitted to experimental data using well-known thin-layer drying models among which Page model ($MR = e^{-KTn}$) gave better fit for all drying data under all conditions tested with a higher R^2 , less root mean square error(RMSE) and residual sum of square (RSS). The initial moisture content of fresh mango was found to be between 74.65 and 76.58 % (wet basis) Compared to hot air oven drying, vacuum drying process saved around 38 % of drying time for drying of mango chips to safe moisture level (4-5%). After drying process, samples were subjected to powder using laboratory grinder and kept for shelf-life study for six months.

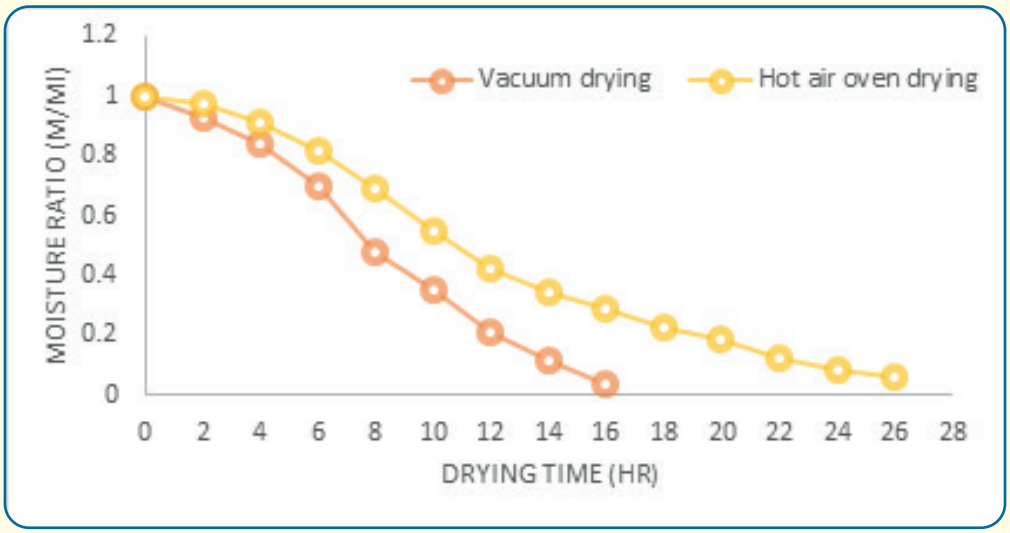
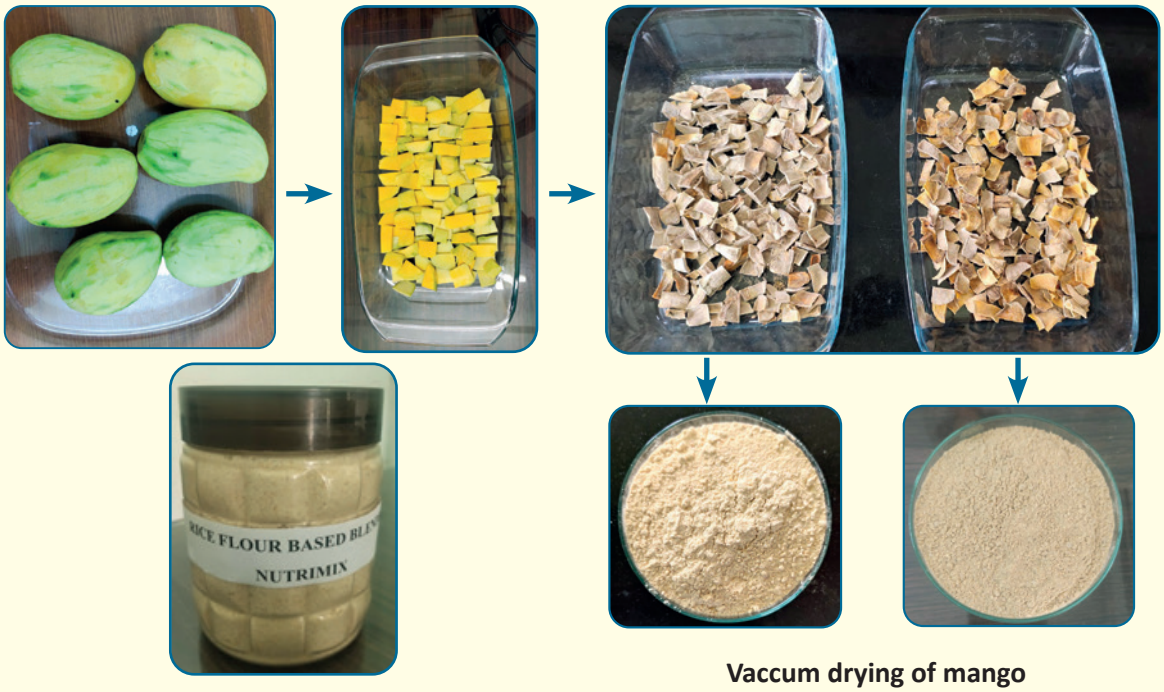


Fig 2.1.19 Effect of drying technique on moisture content of nutri -mix

Development of rice flour based nutri-mix

In this year, rice flour based nutri-mixed product was developed using rice, mung dal, chana dal and nuts as per **Table** given. All four ingredients were roasted in a frying pan until light brown in colour and having a pleasant aroma. After roasting, mixing was done using laboratory mixer followed by packaging in PVC container for shelf-life study. Based on organoleptic score (Hedonic scale), it was found that the product developed in the ratio of 4:1.5:1.5:3 is best among all having energy content of 371 kcal with protein, carbohydrate and fat content of 16.6g, 61g and 6.2 g, respectively per 100g. The nutri-mix can be cooked with half glass of hot water or milk followed by addition of jaggery for preparing porridge of desired consistency to be consume as healthy breakfast diet.



Vaccum drying of mango

Table 2.18. Mixing levels in products

Ingredient	Composition		
Rice	30	40	60
Mung dal	25	15	25
Chana dal	25	15	10
Nuts (Cashew)	20	30	5

2.1.19 Drudgery reduction of women involved in fish processing through technological interventions (2017-2020)

Jyoti Nayak, Tanuja S. and Chaitrali S. Mhatre

The project was undertaken with the objectives, to document existing technologies related to fish processing developed by ICAR and other national institutions. This project fulfilled the proposed objectives for assessing the drudgery related activities and documented the available technologies for women in fish processing, refined and developed women friendly technology package for fish processing activities to mitigate drudgery. Comparative assessment was carried on traditional Vs improved technology package for mitigation of drudgery of women involved in fish processing. The women workers carry out the operation with their hands, and there is lot of drudgery involved in it. The posture adopted during the operation is also not proper and leads to occupational health problems. The suitability of equipment to farm women can be judged in better way using ergonomical studies as ergonomics cover all aspects that deal with anthropometry, assessment of workload, working environment and safety features/mechanism to optimize human-machine environment system. This helps in increasing their working efficiency with reduced drudgery by fitting to the capabilities and limit of human operators/ workers. To assess the gender based drudgery prone activities and testing the solution through available/ refined technologies in fish processing, the study was conducted in Balidiha, Chollonom 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 six parameters on which drudgery scores were calculated were, Rating on work demand, Rating on feeling exhaustion, Rating on posture assumed in work, Perception on manual loads operatives, Rating on difficulty perception and Rating on work load perception. Fish processing includes all activities from fish harvest to till reaches the consumer. The entire processing sector is highly dependent on women as women comprise more than 90% of the workforce in shrimp peeling and 70% in the processing of other fish products. It was elicited that Sorting, Cleaning, Drying, Marketing were women dominated activities in fishery sector. Sorting and cleaning were tedious and requires constant squatting position. The drudgery in marketing was rated very high on work demand and feeling exhaustion. The fisherwomen carry loads of fish from the shore or ports to the nearest markets every day. The women carry the fish on their head and with the load of 35-40 kgs, the pressure comes on their body, especially back. The subsistence fisherwomen are prone to health hazards due to exposure to extreme temperature, poor ergonomic practices and exposure to pathogens, whitlow etc. The cumulative drudgery scores for all the above activities are presented in **Table**. The most drudgery prone activity was marketing followed by cleaning, drying and then sorting.

Table 2.19: Cumulative drudgery scores experienced by women in different activities of fish processing, N=120

Activities	Drudgery Score Parameters						Total Drudgery score (Max score 30)
	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	
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

The present study provided scope for further research for designing suitable protective clothing/gears for Fish processing workers to the terms and conditions of different parts of the country.

Policy Pathways

The following issues are identified and need based solutions should be provided

- The major issues are drudgery, lack of women friendly capture methods and poor documentation of traditional fishing practices and ITKs.
- facilities for transportation of fish vending are inadequate and access to ice and storage facilities are lacking for retailers
- Limited access to resources faced by women in performing various roles.
- Greater gender equity and promotion of the potential in fisheries to empower women is the need of the hour
- Stereotyping women in fisheries has to be avoided

2.1.20 Design and development of disc type ridger for farm women (2017-2020)

Chaitrali S. Mhatre and Gayatri Moharana

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. Women performing these activities are subjected to various musculoskeletal disorders especially lower back pain., The leverage effect impose heavy pressure on the discs between the lumbar vertebrae when women bend over until the upper part of the body is nearly horizontal. Based on the soil properties, anthropometric and strength parameters of Indian female agricultural labour, a manual disc ridger was developed and tested for operational parameters viz., width of ridge, and height of ridge. The prototype was

developed by fixing two discs facing each other. These disc were free to rotate about the centre. The discs have having disc angle of 35° and tilt angle of 23° for with 5 cm width adjustment intervals. It needed two people for operating the tool in pushing and pulling action. Front handle was used to generate forward pull and back "u" handle for downward push. During operation, the soil is then lifted and partially inverted inwards by the discs to form the ridges. During operational evaluation it was found that it makes acceptable ridges with respect to height (8-10 cm) and width (23-25 cm). The output capacity was 427 m^2/h, which is more than 5 times the traditional method by using spade. The walking speed of the subject is 1.78 km/h. The ergonomic evaluation of ridging operation was carried out with female as well as male agricultural worker (subjects) of Khorda district of Odisha. The average age for female and male was 30 and 37 years respectively. The BMI for the female and male was 23.6 and 29.8 kg/m^2 respectively.

Female- Pull

Female- Push

Male- Pull

Male- Push

The physiological testing was done by the K5 (human energy measurement instrument) and exported to Excel sheet. The mark was made for rest, work and recovery in ever trial. The readings were plotted against time to obtain the physiological data graph, which distinctly shows three phases and range of HR and the average values were taken for further analysis. The graph for female in pulling action is shown in fig 1. The calibration chart (sample for subject 2 shown in fig 3) for individual subjects were also obtained for calculating the VO_2 max. The observations concluded that even tough the work pulse (**ΔHR**) is below the allowable limit, the per cent VO_2 max is above the recommended limit. Hence an optimum work-rest cycle was formulated with 30 mins of work and 7-8 mins of rest for the operator.

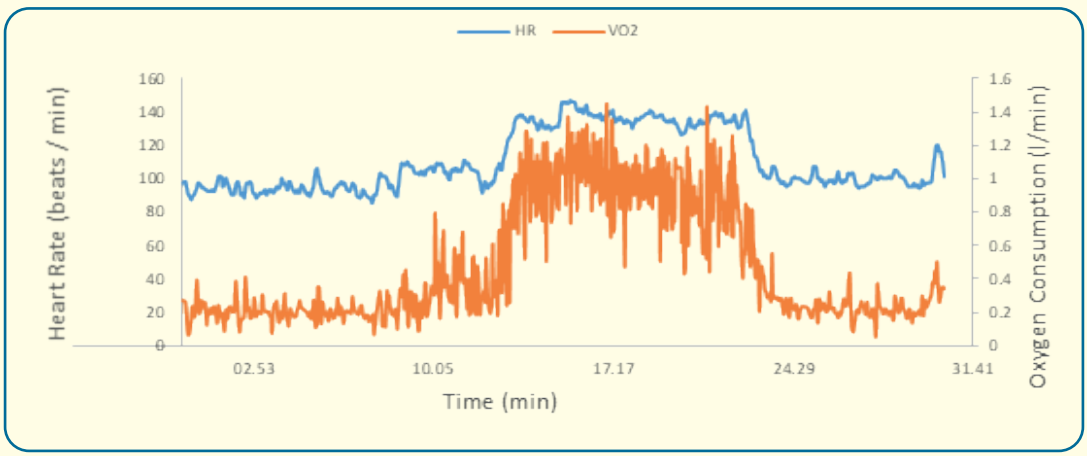


Fig 2.1.20 Physiological data (HR, VO_2 Vs Time) for female in pulling action

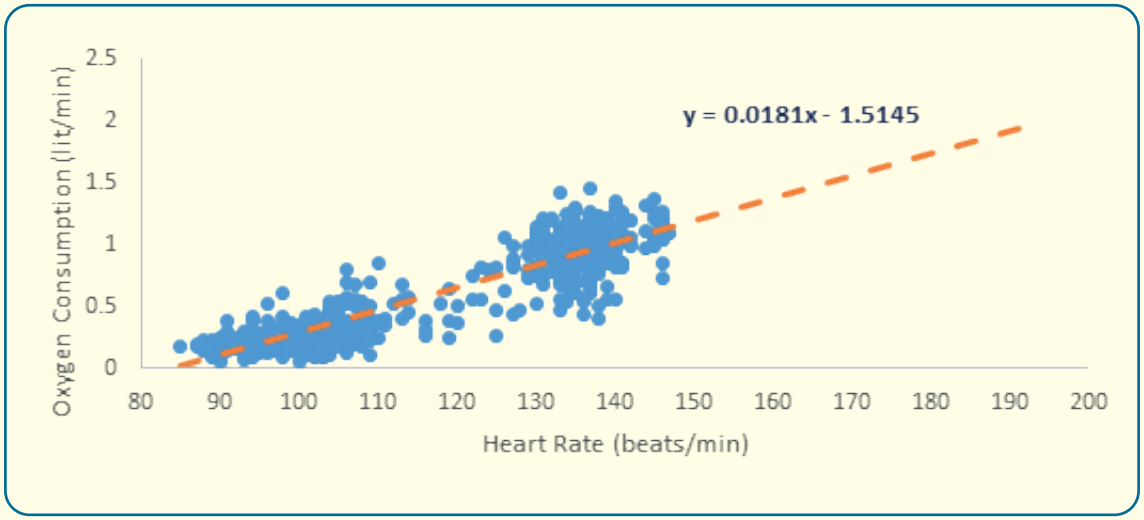


Fig 2.1.21 Calibration chart and equation for selected subject

The cardiac cost for female agricultural labours of the manual disc ridger is 12 beats/m^2 as compared to 14 beats/m^2 of hand ridger and 42 beats/m^2 of traditional spade method. The cardiac cost for male agricultural labours of the Manual Disc ridger is 6 beats/m^2 as compared 8 beats/m^2 of hand ridger. Hence the saving in cardiac cost for female is 72 per cent and 6 per cent as compared to traditional method and hand ridger respectively. The cardiac cost saving for male by using disc ridger as compared to hand ridger is 25 per cent. It was observed that the ODR score of females for disc ridger was 4 as compared to 7 for spade and for males it was 3 for disc ridger and 5 for spade. Hence it was concluded that ODR was less for the disc ridger as compared to traditional spade method. It can be seen that the REBA score of traditional ridging operation with the spade is 10 while for disc ridger it is reduce to 5 & 4 for pulling and pushing respectively for female. This is due to correction of posture i.e. the bending posture is changed to standing posture. For male similar pattern is observed. RULA score for both male and female is also reduce as compared to traditional practice. The developed Manual disc ridger is a women friendly tool that can be used to form ridges and channel with proper work rest cycle. The developed tool was popularised among the stakeholder and was found acceptable.

2.1.21 Study of Farm equipments and tools for drudgery reduction of women in agriculture (2020-2023)

Chaitrali S.Mhatre and Jyoti Nayak

Agricultural census report (2010-11) shows that women own 13.87 % operational land holdings and 11.57 % of area operated in 2015-16 as compared to 12.79 % and 10.36 % respectively in. Thus, more females are participating in management and operation of land. Out of this 13.87 % land owners, 72.22 % are in marginal class with an average land size of 0.35 ha.

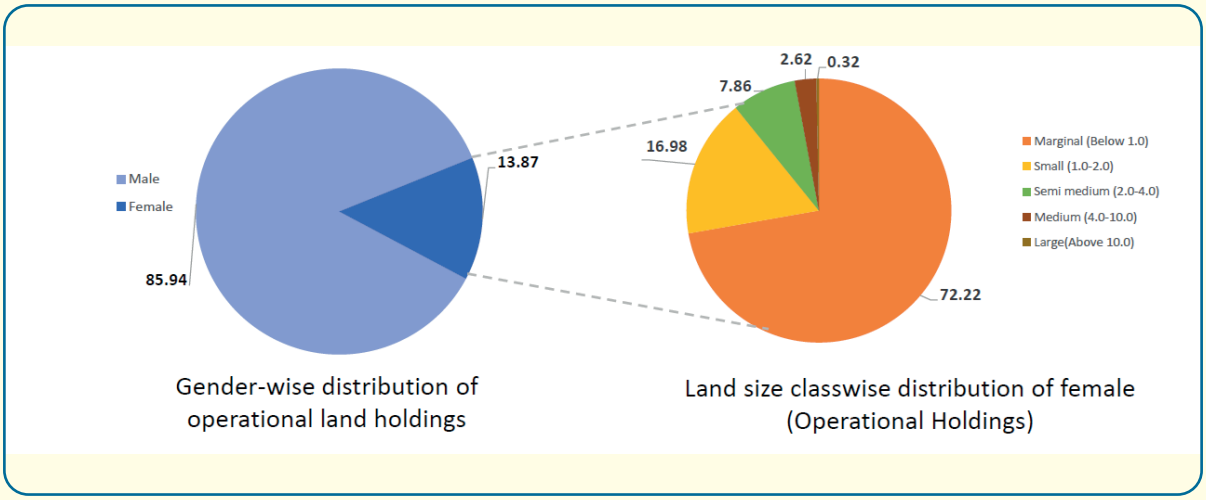


Fig 2.1.22 Distribution of land holdings

Meanwhile, there has been a decline of men's participation in the agriculture in recent years due to their migration in other sectors.The Periodic Labour Force Survey (2017-18) also shows a sharp decline in the worker to population ratio for rural women. It has dropped from 24.8%t in 2011-12 to 17.5% in 2017-18 (*all ages data*). This decline is observed more in group of lower income and lower literacy. Considerable proportion of this decline is accounted in the decreased participation of women in agricultural and allied activities. The report stated that, among the female workers engaged in agricultural activities the proportion decreased from 88.1 per cent in 1977-78 to 73.2 per cent in 2017-18. There is a need to counter this decline and retain the women in agriculture and allied sector by providing drudgery reducing tools and equipment for achieving sustainability. As per Monitoring, Concurrent Evaluation and Impact Assessment of Sub-Mission on Agricultural Mechanization, 2018 report by Mechanization & Technology Division of Ministry of Agriculture and Farmers Welfare, the current national farm power availability in India is 2.03 kW/ha. For achieving desired intensity of cropping average and productivity, farm power requirement of 2.5 kW/ha by 2022 and 4.00 kW/ha by 2030 is considered essential. The majority of farm tools designed in research institutes (ICAR, SAUs etc.) or manufacture's workshops are developed considering economics, at the expense of human comfort and safety are largely catering the needs of male operators. As women play a significant role in agriculture and allied sectors, there is need to focus on the importance of ergonomic design principles while manufacturing the farm tools for women facing drudgery and unsafe work conditions. The project undertaken will be assimilating a database of farm tools and equipment developed in various ICAR institutes, SAUs etc.. It will also map the farm power availability and generate database of women friendly equipment and tools based on production systems in different agro-ecological regions for formulation of programme by policy makers. It will help to evaluate the selected tools for ergonomics and safety measures. The Monitoring, Concurrent Evaluation and Impact Assessment of Sub-Mission on Agricultural Mechanization, 2018 report was studied and the data was analysed. The states were segregated in three classes, as follows.

Table 2.20: States classified under different FPA

FPA more than the National Average (2.03 kW/ha)	FPA between 1.00 and 2.03 kW/ha	FPA less than 1.00 kW/ha
Andhra Pradesh	West Bengal	Assam
Bihar	Odisha	Arunachal Pradesh
Gujarat	Madhya Pradesh	Manipur
Haryana	Rajasthan	Meghalaya
Karnataka	Tripura	Mizoram
Punjab	Chhattisgarh	Nagaland
Tamil Nadu	Jharkhand	Sikkim
Telangana	Maharashtra	
Uttar Pradesh	Himachal Pradesh	
Uttarakhand	Jammu & Kashmir	
	Kerala	

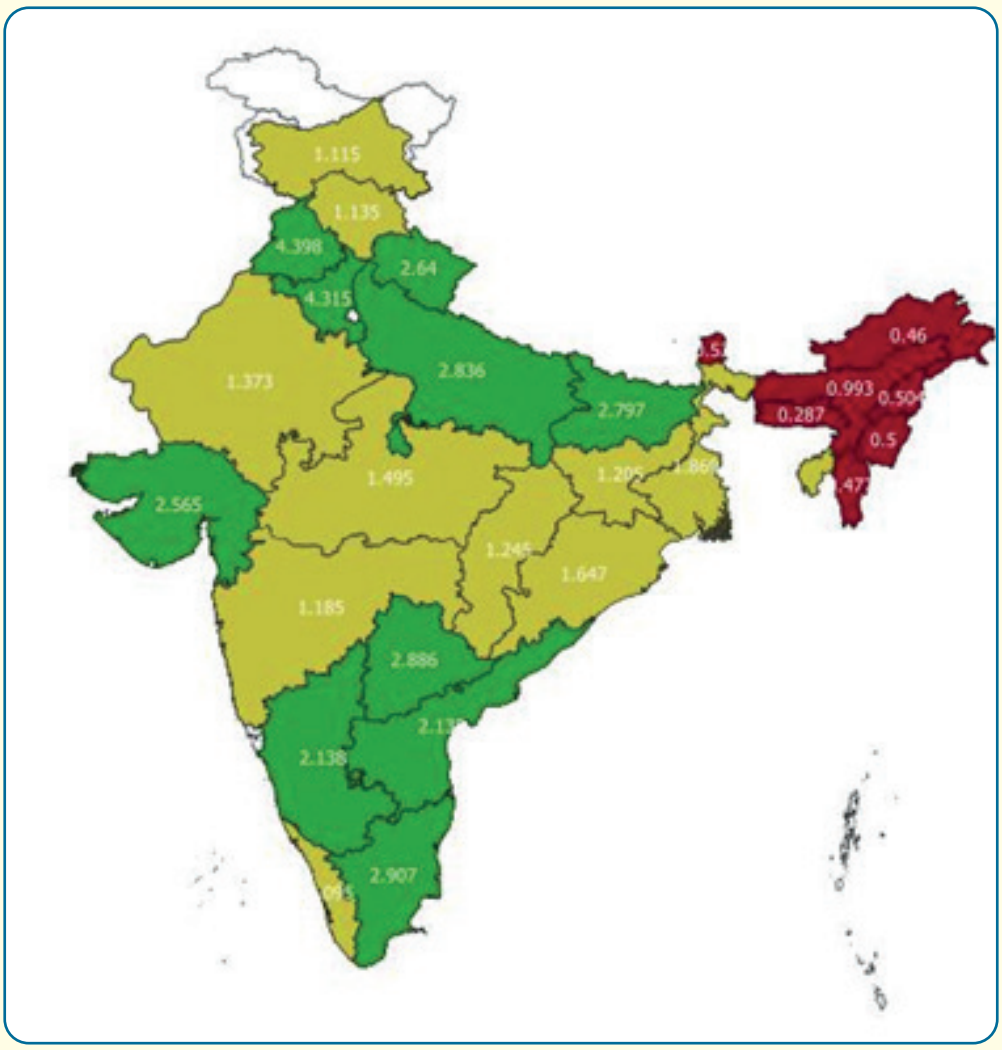


Fig 2.1.23 FPA in different states of India

2.1.22 Development of Gender Sensitive Entrepreneurship Model through Institute-Industry-Stakeholders Linkage in Convergence Mode. (Extramural Research Project) (2019-20)

Lipi Das, S. K. Srivastava, Biswanath Sahoo, Gayatri Moharana and 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 Khurda 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.

Horticulture Sector: Needs of farm women were identified engaged in the horticulture industry 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, collection was mostly done by women. In industries mainly manual packaging was done by 80% of women and 40% 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%).

Dairy Sector: It was found that the role of women in dairy industry is extensive in the production phase, whereas the involvement of women in processing activities remains shoddy. The primary reason/

perceptions for the poor involvement of women in dairy industries were identified viz., industry is mainly men dominated; heavily mechanized industry; lack of training on mechanization aspects in dairy sector etc.

Mechanization: Majority 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 % 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%).An Institute-Industry-Stakeholders Interface was organized under this project on 22 January, 2020 with a core objective of analysis of role performance, needs, perceptions and constraints of women farmers working in dairy, farm implements and horticulture sectors and ultimately formulation of a strategic plan for designing appropriate gender sensitive entrepreneurship model in a convergence mode. An interface-cum-skill based training was organized for adopted farm women on 13 March, 2020. During the programme, the importance of skill based training on dairy, horticulture and mechanization sectors were discussed. Training skill on preparation of urea molasses mineral mixture block as feed for cattle and goats was also discussed. Various small drudgery reducing tools such as improved sickle, hand hoe, khurpi, rose can, sprayer etc. were distributed and demonstrated to the adopted farm women. A technical bulletin on the research project has been published including all the project achievements and policy recommendations with ISBN 819442680-4.

Different activities under the project

2.1.23 Women Empowerment and Gender Sensitization–Developing a Model for Bridging Gender Gap (NASF Project) (2019-22)

Lipi Das, Praveen Jakhar and Gayatri Moharana

The project was implemented in a cluster of two villages *viz.,* Sankilo and Tentalpur under Nischintakoili block of Cuttack district of Odisha with the aim of creating and sustaining women empowerment and gender sensitization for bridging the gender gap. Gender gap indicators were identified and assessed using the SHEET (Social-Health-Environmental-Economic-Technological) module from a sample comprising of 40 farm families through on-farm and off-farm survey, workshops and brainstorming sessions. The major areas of gender gap identified were 'equally paid for same amount of work done'(82.5%) in social aspect; 'BMI (Body Mass Index) of female is at par with recommended BMI' (92.5%) in health and nutrition aspect; 'equal access, control over land and water' (72.5%) in environmental aspect; 'avail loan from financial institutions'(87.5%) in economic and 'knowledge in carrying out crop production and post-harvest activities' (57.5%) in technological aspects, respectively. A three-tier approach for 'Gender Sensitive Agri-Horti Cropping System Model' was developed for livelihood upliftment, nutritional enhancement and entrepreneurship development. Demonstrations on HYVs of paddy, black gram, vegetables, fruit crops and paddy straw mushroom were conducted under different cropping system model. The group approach in vegetables, farming under livelihood enhancement model has generated a total income of Rs. 6,59,300/- out of which a value of Rs. 98,895/- of vegetables, has used for household consumption and Rs. 5,60,405/- of vegetables, sold in open market and this model also created awareness among the women group and motivated them to replicate in different location of the cluster. Similarly, the group approach in vegetables, farming under nutritional security model has generated a total income of Rs. 8,45,750/- out of which a value of Rs. 6,76,600/- of vegetables, used for household consumption and Rs. 1,69,150/- of vegetables, sold in

open market. Also it enhanced the nutritional status of farm women and generated lot of awareness among the women group which motivated them to replicate this farming in different location of the cluster. Highest Benefit cost ratio of vegetables, observed in brinjal (3.41) followed by chilli (3.20) and in paddy it is highest in var. CR-Dhan 312 (2.46) followed by var. Pradhan Dhan (2.29) and var. Maudamani (2.25). Among the major perceived constraints in adoption of HYV green gram among farm women, infestation of yellow mosaic virus in HYV of green gram was found to be the top most constraint followed by yield of HYV is less than local variety and HYV susceptible to IPD as of local variety (40.21).

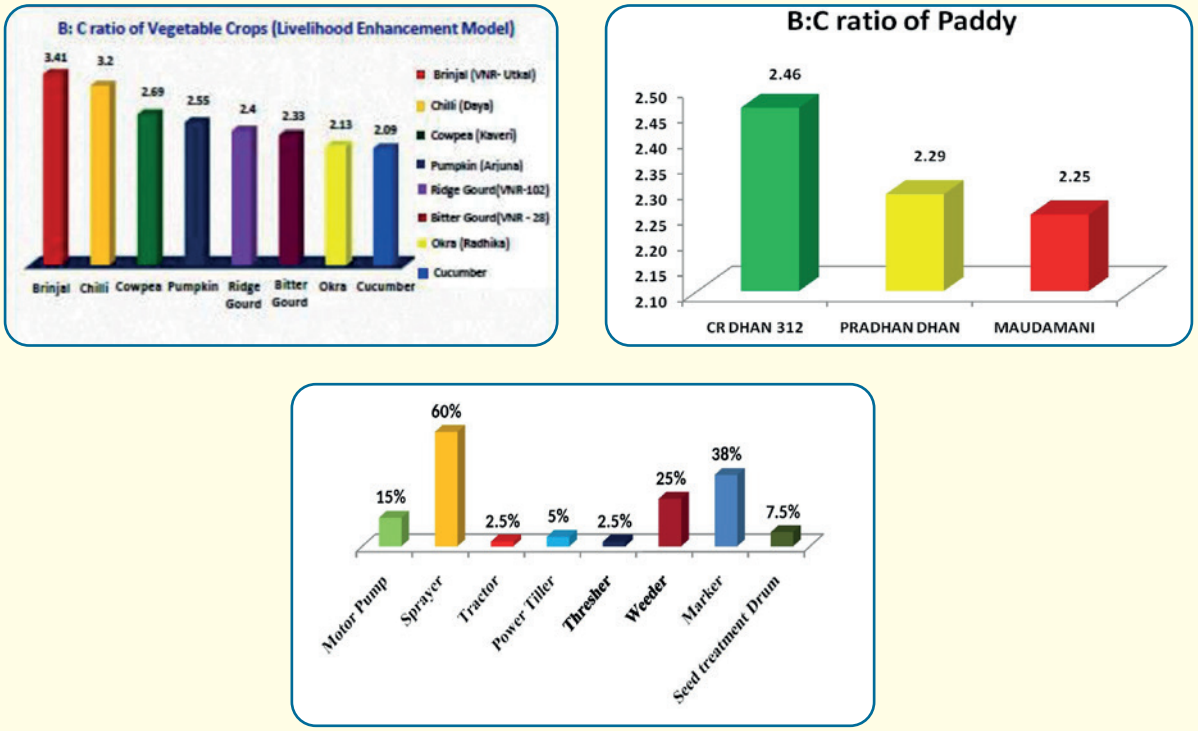


Fig 2.1.24 Economic evaluation of different components of the model

In context of degree of mechanization, it was revealed that only 2.50 % of respondents hired improved machineries *viz*. sprayer, tractor, power tiller and thresher. Regarding the most drudgery prone activities perceived by the farm women were harvesting, uprooting and manual transplanting specially in rice farming. Demonstrations of drudgery reducing farm tools were conducted. On the basis of the above identified critical gender gap an indicator, the gender sensitive extension model was designed to promote gender friendliness to the existing current extension services. The model focuses on gender sensitive extension as the central core of any developmental programme. Under Farm women-Scientists Interface a total number of two workshops, ten training programmes and twenty two demonstrations/field visits were conducted during the period. A technology folder with ISBN Number 978-81-944268-2-0 was published.

2.1.24 Increasing productivity of rice-based cropping systems and farmers income in Odisha (IRRI-CIWA Collaborative Project) (2017-2021)

Arun Kumar Panda, J.Charles Jeeva, Sabita Mishra, Jyoti Nayak and Ananta Sarkar

Under the ICAR-CIWA-IRRI collaborative project "Increasing Productivity of Rice-based Cropping Systems and Farmers Income in Odisha" with the component "*Women's Leadership for Impact in Agriculture Development* " an Women Farmer Producer Company named "Chitri Dora" was formed with the help of grantee Partner PRAGATI at Koraput involving 1031 tribal women farmer, covering 30 Producer Groups, for collective marketing of aromatic rice. The project proposed to address the problems in value addition and marketing of aromatic rice as well as other rice through strengthening of the Farmer Producer Company, so that the women farmers get access to the market and share in profit. Since there were no processing units/mills within the proximity of the proposed area for processing of aromatic rice, a rubber sheller rice processing unit

was established in B. Ghatarla village of Kotpad block in Koraput district. The rice processing unit has the capacity for processing 500kg per hour. Five members of the producer company were trained on operation of the rice processing unit.

Rice processing unit established at B. Ghatarla village of Kotpad block

Under this project, an interface was conducted on 24th January, 2020 at Satyabadi, Puri along with grantee partner SWAD involving researchers from various institutions, extension specialists, social enterprises, NGOs, agri-input dealers and women farmer groups for creating an enabling environment to achieve the goal of improved productivity with profitability. IRRI super bags were distributed among 500 women farmers for safe storage of seeds and the intervention was documented by interviewing through a structured questionnaire and discussing with randomly selected women farmers. It was revealed that all the beneficiaries (100%) have adopted the method of storing seeds in IRRI super bags. All the respondents observed the seed quality to be better and free of insect/pest attack during storage in super bags compared to the traditional method of storing seeds.

Interaction with farm women on quality of seeds stored in IRRI Super bag

2.1.25 Adding value to fish: a potential livelihood option for rural women of Odisha (DSIR project) (2018-2021)

Tanuja S. and J. Charles Jeeva

The project was initiated with the objective to build the capacity of 200 (members of SHGs) fisherwomen of Puri through skill and management training to be successful entrepreneurs in value addition of fish. Forty master trainers have been selected from 17 SHG groups belonging to 3 villages of Balidia, Kanamana and Pentakota of Puri District. They were given 3 management trainings and 3 skill trainings in 2020. An exhibition of the pilot production of value added products by a group of 12 master trainers belonging to two SHG groups *viz.*, Biswa Bharati Maa and Maa Mangala of the Kanamana and Astaranga village was arranged in connection with the Foundation Day and Technology Demonstration Mela of ICAR-CIWA on 17February, 2020. They were also facilitated to take part in a research-extension-farmer interface meeting organised in connection with the foundation of the institute. They sold the first batch of value added fish products during the exhibition on a pilot basis and earned a revenue of Rs. 1,650/-. The building for production of value added fish products has been identified in the village Kanamana, Astaranga.

Women beneficiaries participating in exhibition with the value added fish products

A FSSAI license number (FSSAI no 22020026000056) has been obtained in the month of March, 2020 for sale of food products in the market establishing linkage with Mission Shakti, Odisha for marketing through digital technologies like e-banking, e-commerce and social media. The proximate and nutritional composition of the products were analysed for lebelling in the packets. They have ventured into online marketing taking into consideration the COVID-19 pandemic situationwith trade license from the Bhubaneswar Municipal Corporation under the trade name "Fishlikes". The value added products were also displayed through the marketing website bikayi.com under the trade name Fishlikes. Market linkage was strengthened for the rural women SHGs by linking them with Falcon Chilka Fresh retail outlets in Bhubaneswar on 20 August, 2020. Dr. S. K. Srivasatava, Director, ICAR-CIWA launched the first marketing of value added fish products prepared by the SHGs at the Falcon Fresh Fish outlet. The linkage was publicized through several local languages and English newspapers (7 nos).The sale of prawn pickles has gained momentum and the women are gaining a profit of Rs. 130-150/kg of the pickle. In this way a model for entrepreneurship development in value added fish products for rural women has been developed. Under the project, a technical bulletin, one research paper, one popular article and 10 extension folders have been published. The entrepreneur Mrs. Pinaki Parimita was invited to various occasions like World Food Day (16 October, 2020), Kisan Diwas (23 December, 2020) to share her experiences in her journey towards starting the enterprise.

Market linkage with Falcon Chilka Fresh

Brand name with logo

An experiment on the shelf life of prawn pickle stored at room temperature and 4^{0}C was also conducted. As per the study, the pickle stored at refrigerated temperature had a shelf life of more than 6 months whereas the sensory score of pickle stored at room temperature showed a marked reduction by the end of 6 months. An experiment was conducted to standardise the amount of salt to be applied to medium fish like sardine to attain the amount of salt as regulated by FSSAI. Salt was applied to fish at 1:10, 1:8 and 1: 6 ratio of salt to fish the sardine. The experiment revealed that 1:8 ratio of salt to fish is best for maintaining the salt content within the stipulated values set by FSSAI.

Table 2.21: **Quality indices score of prawn pickle at the end of 6 months storage**

Parameters	Pickle stored at 4^{0}C	Pickle stored at room temperature
pH	4.38	4.52
TVBN mg/100g	50.03	54.37
PV(meq/kg oil)	14.44	16.08
FFA (% oleic acid/100g)	7.09	7.59
TPC (log Cfu/g)	3.83	3.96
Sensory score	6.67	5.67

Table 2.22:**Salt and moisture content in market samples and experimental samples**

Fish variety	NaCl (%)	Moisture (%)
Ambassis	16.12	22.35
Sardine	15.07	34.38
Mackerel	17.81	34.47
Goat fish	24.82	28.54
Experimental sardine (1:10 salt:fish)	7.66	20.9
Experimental Sardine (1:8 salt : fish)	12.62	20.35
Experimental Sardine (1: 6 salt : fish)	23.5	27.15

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

Chaitrali S Mhatre and Jyoti Nayak

Design and Development of Women friendly power operated groundnut decorticator and stripper

The designed machine work in two modes viz., stripping operation and decorticating operation. Overall dimension of the machine after suitable modification over the original design of the previous year is 77.5 cm x 50.2 cm x 101.5 cm. Stripping the pod from the vines of the crop and decorticating of the pods are laborious activity. The stripping of the pods from the plant material was done by combing action. Combing action ensures maximum number of pods separated from the plant material. The combing shoe was fitted with the pegs of height 4 cm and pegs are spaced 2 cm apart, but the pegs on the two racks are placed in staggered mannerwith1 cm effective spacing. Total four number of strippers were there in the machine. The decorticating of the kernel from the pod was done by combination of impact and shear action. The shoe has studs protruding from the surface to impact on the pods and shears the pods against the concave. There were two decorticating shoes in the machine.

Exhaustive testing of the Machine in stripping mode:

The developed groundnut stripper was tested for 20 hours according to the "Test code for power thresher for groundnut" (IS: 11234 - 1985) with essential modification. After the pods were stripped from the plant, operator dropped it on the other side as shown in The machine was tested for various factors such as wear and tear, breakage, slippage or any other operative difficulty. From the exhaustive testing of the machine in stripping mode, it was observed that there was no visible wear and tear in the stripping shoe, no slipping of the belt from the pulley, no knocking or rattling sounds and no slackness in any component of the machine. The bearings and central shaft on which shoes were mounted were observed to run smoothly. Nominal loosing of some bolts was observed which needed to be tightened once during the whole operation. But the said loose bolts did not hamper any operation, neither did it pose any safety issue. The machine was well balanced along with proper positioning of weld seams and appropriate anti-corrosive coating.

Ergonomic evaluation:

The operation of ground nut stripping was divided into smaller activities viz., feeding, collection and cleaning. The pulse rate of male (28 to 32 yrs.) and female (26 to 31 yrs.) subjects were recorded for each activity. The average of the same is given below.

Table 2.23. Ergonomic performance evaluation in stripping operation

Activities	Work pulse (Δ HR) beats/min		Energy expenditure *(Equation)* kJ/min	
	Female	Male	Female	Male
Feeding	6.3	12	0.363	0.418
Collection	4.0	11	0.338	0.404
Cleaning	4.7	17	0.345	0.488

It was observed that work pulse was below the LCP (40 beats/min) making the operation ergonomically acceptable. The sound measurement was also done at the operator's ear level. The average value for left ear was recorded 82 dB, while for right ear it was recorded 83 dB making it acceptable in present condition. The cleaning efficiency (61.29%) was below acceptable limits and the cleaning process took approximately 1.5 hrs for cleaning 1 kg groundnuts. It was concluded that there is a need for developing an efficient cleaning mechanism for separating the foreign material from the pod mixture.

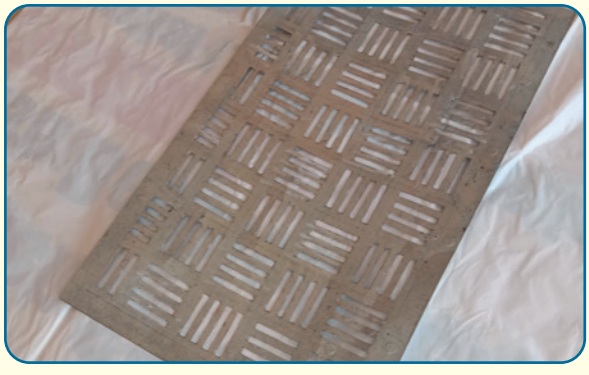
Design and development of double screen groundnut pod cleaner:

Measurement of length, width and thickness of 100 pods of groundnut was taken. The foreign mixture such as twigs, leaves was also studied. As the groundnut is oblong in shape the holes were made rectangular. In the first attempt, all the holes were in horizontal alignment. The first screen (*upper*) was designed so that the pods pass through it along with the dust and smaller twigs retaining the lengthier twigs and leaves on top of it. Thus, length of the hole was kept 5 cm and the width was kept 1.7 cm. The size of the opening was reduced to arrest the pods on top and let the debris pass through it. The second screen (*lower*) was designed so that the maximum pods were retained on it and the debris such as smaller twigs, dust and crushed leaves passed below. The dimensions of the holes were kept as 6.2 cm length and 0.8 cm width. Upon analysis of the data, even this screen provided lower separation efficiency. It was decided to combine the two screens to form a double screen groundnut pod cleaner. The two screens were fitted in a box with slits to hold them. The specific dimensions of the double screen groundnut cleaner are given below:

Cleaning of groundnut pods from pod mixture

Exhaustive testing of groundnut stripper cum decorticator

Full size upper screen



Full size lower screen

Table 2.24. Specifications of hanging type double screen groundnut pod cleaner

Particulars	Specifications
Upper screen	73cm× 43cm
Individual sieve of upper screen	5cm× 1.7cm
Lower screen	73cm× 43cm
Individual sieve of lower screen	6.2cm× 0.8cm
Total box	73.5cm× 43cm× 13cm
Gap between upper and lower screen	6.5cm
Groundnut pod removing outlet	43cm ×5.5cm
Covering of groundnut pod removing outlet	42.5cm× 14cm
Handle for holding	27.5cm× 7.5cm(ϕ2.5cm pipe)
Total weight	7700gm

Performance evaluation of double screen groundnut pod cleaner:

The developed screens were tested for their separation efficiency and cleaning efficiency. The separation efficiency was determined as per the IS 11473: 2002 with appropriate modification. And the cleaning efficiency was determined as per the IS 11234: 1985. The pods were separated from the plant using the developed groundnut stripper. The pod mixture at the pod outlet was collected and transferred to the cleaner. The operator shook the cleaner to-and-fro, causing the pods to pass through the screen, till most of the pods had visibly passed down from the upper screen and no more debris was falling from the lower screen. The operator was also asked to move hand through the pod mixture once or twice for better separation. The individual screen effectiveness for the first screen is 0.29. The lower screen/screen-2 is ideally supposed to arrest all the pods larger that it's opening (6.2x0.8 cm). It was observed that this screen mostly retains the pods. The ones that pass through it were very small in size and did not contain a healthy kernel. The screen effectiveness of the second screen is 0.58. As both the screen individually did not give the expected separation, they were tested for combined screen effectiveness. The combined screen effectiveness and cleaning was calculated. It was noted that the separation efficiency for the cleaner is 0.87, while the average cleaning efficiency is 93.36% which was significantly higher than the 61.29% that was before the use of cleaner. Also the screen loss is 2.67 which are almost on par with permissible level. It was also observed that the cleaning process took approximately 2.68 min for cleaning 1 kg groundnuts. The pulse rate of male (28 to 32 yrs.) and female (26 to 31 yrs.) subjects were recorded during rest, work and recovery phase while working on the hanging double screen groundnut pod cleaner. The time required for recovering was also recorded. The average results of the same are tabulated below:

Table 2.25. Ergonomic performance evaluation in cleaning operation

Activities	Work pulse (Δ HR) beats/min		Energy expenditure *(Equation)* kJ/min	
	Female	Male	Female	Male
Operating the cleaner	14.6	6.25	0.42	0.39

The work pulse is well below the LCP (40 beats/min) for female and male subjects hence the operation is ergonomically acceptable. The energy expenditure for both the genders is also within the upper limit for work load for a day long work.

Ergonomic evaluation of decortications operation:

The operation of ground nut decorticating was divided into smaller activities viz., feeding, collection and cleaning. The pulse rate of male (28 to 32 yrs.) and female (26 to 31 yrs.) subjects were recorded for each activity. The average of the same is given in **Table**. The work pulse is well below the LCP (40 beats/min) for female and male subjects hence the operation is ergonomically acceptable.. The energy expenditure for both the genders is also within the upper limit for work load for a day long work.

Table 2.26. Ergonomic performance evaluation in decortications operation

Activities	Work pulse (Δ HR) beats/min		Energy expenditure *(Equation)* kJ/min	
	Female	Male	Female	Male
Feeding	4	1	0.279	0.236
Collection	22	2	0.477	0.25
Cleaning	23	31	0.488	0.656

Feeding

Collection

Cleaning

Sub Project 3: Empowerment of women through socio-technological interventions in mechanization

It was proposed to develop a scale which will ease the problem identification in the farm women of the specific location. Thus, it will channel the efforts of the researcher in proper intervention. Data was collected from respondents of various blocks of Puri district of Odisha state via telephonic conversation. Analysis of the data was done to arrive to the scale values of dimensions. These values were calculated on the basis of the response of the respondents to the questions asked. Probable training modules were designed suitable for the respective blocks.

Case study I: Nimapada, Puri: Nimapada block of Puri district in Odisha was selected for study. It is divided into 1 town and 236 villages. It is situated 45 km from the state capital of Bhubaneswar. The altitude above mean sea level is 8 m. The literacy is 85.41 % and the sex ratio is 971. Data was collected from 100 unknown respondents over telephonic conversation.

Case study IV: Satyabadi, Puri,

Satyabadi block of Puri district in Odisha was selected for study. It consists of 173 villages. It is situated 46 km from the state capital of Bhubaneswar. The altitude above mean sea level is 8 m. The literacy is 85.01 % and the sex ratio is 969. Data was collected from 100 unknown respondents. The observations are tabulated below.

Table 2.27. Representation of observations for ICAR CIWA PRA tool for mechanization

	Knowledge	Skill	Attitude	Access
Nimapada	0.25	0.23	0.73	0.55
Satyabadi	0.19	0.48	0.78	0.53

Knowledge & Skill of the farmers in Nimapada Block regarding the farm mechanization is very low. Hence, during training conduction ample amount of time needs to be dedicated to knowledge enhancement and skill up gradation. The attitude is positive, thus, the training will be received well by the farmers. The access in the means of custom hiring can be improved. Knowledge of the farmers in Satyabadi block was found to be very poor. Thus during training more emphasis should be given in knowledge improvement. It may be done by the means of practical demonstrations of tools, Video presentation of various government schemes etc. Farmers here have medium level skill hence on farm training will improve their performance even further. Attitude is positive. Access is acceptable, but still there is scope to improve.

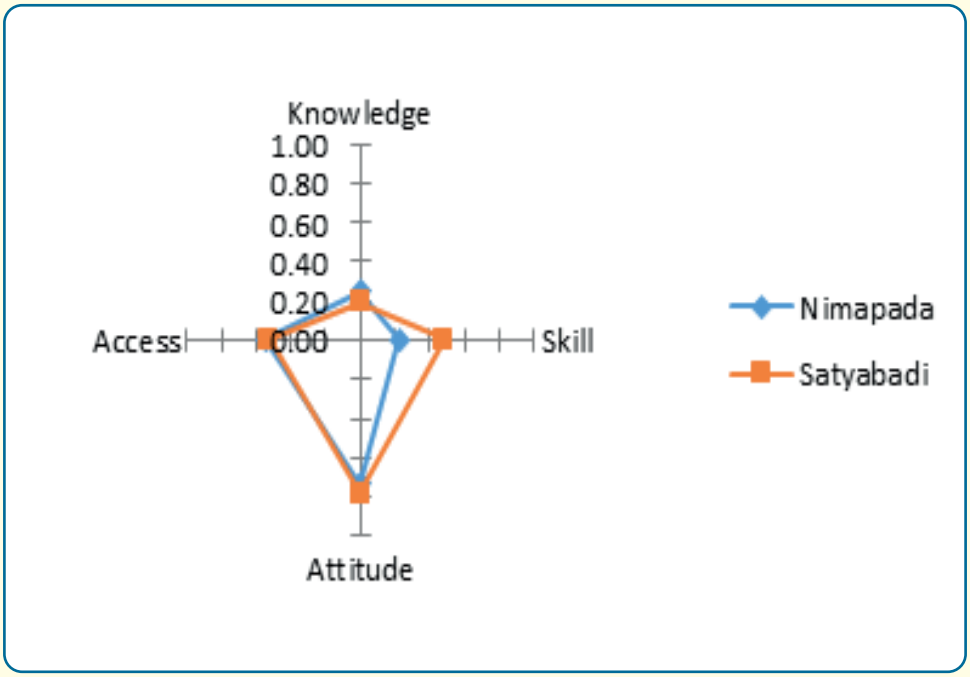


Fig 2.1.25. Graphical representation of the Knowledge, Skill Attitude and Access of the farmers with regards to farm mechanization

2. 2 RESEARCH ACHIEVEMENTS ALL INDIA COORDINATED RESEARCH PROJECT (HOME SCIENCE)

2.2.1 Development of region-specific therapeutic foods for prevention of diabetes

Development of low glycemic index (GI) food for diabetic patients

The Germinated Brown Rice (GABA rice) was developed by AICRP Centre, TNAU with an aim to control the maintaining blood sugar levels within normal levels and in reverting pre-diabetic status. The GBR will serve as nutraceutical rich functional food which can be gainfully targeted towards the health food sector for prevention and management of diabetes mellitus. Brown rice is the ultimate alternative diet. It contains more, nutritional components such as dietary fibers, phytic acid, vitamins E, vitamin B and γ-amino butyric acid than polished rice due to the presence of outer bran layer being the main source for the nutritional elements. The developed Germinated Brown Rice (GABA rice) has Low Glycemic index of 49.74 which is helpful for diabetic patients. The GBR can be used to develop healthy GBR based regional food products like upma, puttu etc. The cost is Rs. 50/- per Kg (vary depending on the rice variety).

ii. High Fibre Ready to Use (RTU) multigrain mix was also developed by AICRP Centre, TNAU to address the problem of degenerative disease like obesity, cardiovascular disease and diabetes mellitus. Grains in specified quantity are taken; Whole wheat (40 g), Kodomillet (22.5 g), Whole horse gram (22.5 g), Modified banana starch powder (14 g) and Fenugreek (1 g) cleaned and roasted at 70°C for 5-6 minutes individually until it turned to light brown colour. The roasted ingredients were pulverized into flour and mixed together. Then the flour packed in 200 gauge poly bags and stored in ambient condition. High fiber RTU multigrain mix is both hypoglycemic and hypolipidemic which confer protective effect against Non Communicable Diseases (NCDs) such as diabetes, certain cancers and also promote a healthy gut. The crude fiber and resistant starch content of high fibre RTU multigrain mix was 8.2 per cent and 6.74 per cent, respectively which contributes to the functional benefit. The cost is Rs. 150/- per Kg.

iii.Nirog atta (ready to use high fibre flour) was developed by AICRP Centre, MPUAT. Composition of this flour (per serving) was barley flour 45g and kala chana flour 25g. The regional therapeutic products prepared from this flour were chapati, khakra, dhokla, gatte/muthia, khaman, upma. The Glycemic index of these products were chapati- 48, khakra -55 which is effective for diabetic patients. The cost of this flour was Rs. 70 per kg. When consumed daily for a period of 4 months (120 days) reduces total cholesterol up to 10 per cent, HbA1C values up to 6% and also controls the blood glucose levels.

iv. Developed two low glycemic index regional breakfast foods i.e. Dalia and Missa parantha and one for lunch and dinner food i.e., chapati. These foods were selected and modified by incorporating the low glycemic foods by AICRP Centre, PAU. These food products were tested for their organoleptic acceptability by a panel of 10 semi-trained judges. After the feeding intervention of low glycemic index foods along with the nutrition counselling for 120 days on 20 pre-diabetic farm women, a decrease of 22.8 and 10.7 per cent in the fasting blood glucose and HbA1c of the selected subjects was observed.

Low glycemic index regional foods Nirog atta (ready to use high fibre flour

v. As nutrition and diet apps represent today a popular area of mobile health, offering the possibility of delivering behaviour change (BC) interventions for healthy eating and weight management in a scalable and cost-effective way. Hence, a Nutri-App is designed by AICRP Centre PJTSAU to access the information relating to BMI, RDA for different age groups, nutrient rich food, balanced diets for different age groups, therapeutic diets (Diabetics, Overweight, Renal failure etc.) and corona virus.

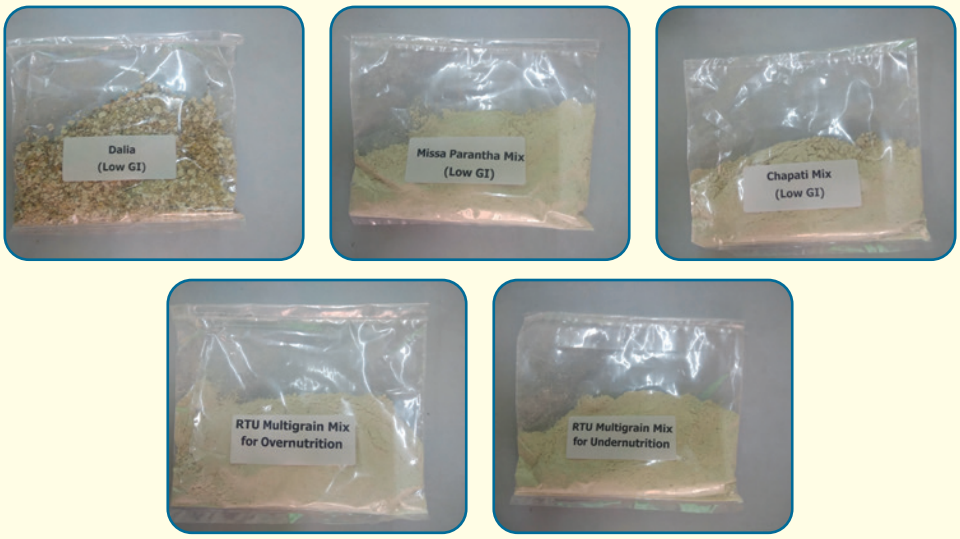
vi. Similarly, three Low GI health mix *viz.* Low GI Roti mix, Low GI Upma mix and Low GI Cheela mix had been developed by AICRP Centre, CAU, Tura.

vii. The database on region specific foods from different food groups having low Glycemic Index (GI) or hypoglycemic properties was developed by AICRP Centre, AAU. Low GI multigrain mix *"Pratikar"* for diabetics was also developed, tested and validated. An educational package on "Diet and Diabetes" and "Management of Diabetes" in both English and regional language was prepared.Low GI multigrain mix *"Pratikar",* Database on region specific foods from different food groups having low Glycemic Index (GI), Educational package on *"Diet and Diabetes"* and *"Management of Diabetes"*

2.2.2. Dietary approaches for management of dual burden of malnutrition among farm women

i. Nutrient-dense mix has been designed by AICRP Centre, TNAU for undernourished individuals, particularly for farm women, utilising region specific nutri cereals and pulses. Nutrient-dense mix is an excellent source of complex carbohydrates, protein, healthy fats, vitamins (beta carotene, B vitamins) and minerals (Calcium, Phosphorus and Iron). Nutri dense RTU multigrain mix have been developed using different combination of brown rice flour (25 g), finger millet flour (20 g), whole wheat flour (20 g), green gram dhal flour (10 g), roasted groundnut flour (10 g), roasted sesame flour (10 g), drumstick leaves powder (2.5 g) and carrot powder (2.5 g).Nutri dense RTU multigrain mix meets 1/3 of nutrient requirements in terms of carbohydrate (59.54g/100 g), protein (17.42 g) and fat (7.68 g) with significant amount of bioactive components. Nutri dense RTU multigrain mix is suitable to plan well balanced diet for the effective management of under nutrition among the farm women. The cost is Rs. 180 / kg.

ii. For management of the dual burden of malnutrition, two ready to use mixtures were formulated namely, Ready to Use (RTU) high fibre multigrain mix (Mix 1) for management of over nutrition and Ready to Use (RTU) nutrient dense multigrain mix for management of under nutrition (Mix 2) by AICRP Centre, PAU. Three food products namely chapati, veg. idli and chilla were developed from RTU high fibre multigrain Mix 1 and were tested by obese subjects. Panjiri, gulgule and mithi roti were developed from RTU Multigrain Mix 2 and were tested by undernourished subjects. Nine point hedonic rating scale was used to assess the consumer acceptability scores for the products. An intervention of 120 days which included feeding of the high fiber RTU mixture (Mix 1) and nutrition counselling, a decrease of 4.84 and 11.8 per cent in the BMI and Total cholesterol levels of the selected obese farm women was recorded and the intervention based on the feeding of the developed nutrient dense RTU mix (Mix 2) for 120 days and nutrition counselling resulted in an increase of 9.32 and 5.43 per cent in the BMI and Hb of the selected under-nourished farm women.



Ready to Use (RTU) Mixtures for management of the dual burden of malnutrition

iii. The Banana Fig was developed by AICRP Centre, TNAU @ Rs. 10/ piece (Var. Karpuravalli) and Rs. 15/piece (Var. *Grand Nine*). The AICRP Centre AAU developed, tested and validated high fibre multigrain mix "*Poshtik*" for overweight and nutrient dense multigrain mix for underweight and an educational package on "Management of Overweight" and "Management of Underweight" in English language.

2.2.3. Reproductive health care in agrarian families

Development of Technology Module/ IEC Material

A Technology Module on "Reproductive health care for Psychological well-being of married women" has been developed in regional language by AICRP Centre, AAU. The module consists of a book (material and training instructions), five booklets and nine numbers of folders (IEC).

2.2.4 Development of parenting index for rural families

A mobile app has been developed on "Effective Parenting" in English as well as in Regional Language (Kannada) for assessing the parental style during 2019-20 byAICRP Centre, UAS, Dharwad. Research findings indicated improvement in pre and post test scores of parenting styles to the extent of 22 per cent. Later app was uploaded to the Google play store on 15th Nov.2020.

Popularization of developed technology (parenting app) with government and non- government organizations a questionnaire is made available in google form, and also distributed personally. totally 85 parents with different age group children were downloaded the App and responded to the questionnaire. Results of this revealed that, majority (82.5%) of mothers expressed high acceptance to the app and about 17.5 per cent of mothers were accepted the app. None were in the range of low acceptance.

2.2.5 Drudgery reducing farm technologies for gender equity

Drudgery of women was characterized in five production system, the experiments were conducted in operational villages selected by each centre and developed / tested/ refined the tools and implements with women's perspective.

Paddy Production System	
Motorized Parvatiya Sugam Paddy Thresher A motorized thresher was developed GBPUAT, Pantnagar for drudgery reduction. This technology was helpful in reducing the stress and strain of the performer and there was an increase in productivity i.e. threshing capacity of 180kg per hour as compared to 50kg per hour by traditional method.	
Maize Production System	
Tubular Maize Sheller To reduce drudgery of farmwomen tubular maize sheller was introduced. After its user trail it was found to be adopted by 23 maize growing farm women who reported to enjoy de-husking in lesser time and reduced physical and mental fatigue.	
Vegetable Production System	
Ring Cutter The tool is ergonomically designed and consists of cutting blades joined to open to the arms. Panicles are cut individually using this tool. The operator is spared of drudgery, discomfort and itching to skin of his hands, which are associated with conventional method of manual plucking without any aid. It fits in to the hand properly to cut the pedicle is exerted by pressing.	
Harvest Bag To reduce the drudgery of women in harvesting of vegetables, harvesting bags were designed by TNAU, Madurai. The newly developed harvesting bag is designed along with zipper at the bottom. This zipper can be opened up by the worker/ by another person and can facilitate easy transfer of harvested vegetables, without having the necessity of lifting and unloading the vegetables, to the jute bags. The designed harvest bag can hold up to 4 kgs.	
Vegetable Trolley It is more suitable in improved method of vegetables, cultivation i.e. Staking/ training the plant. The output capacity with the use of vegetables, trolley was higher (87 kg/hr) than traditional method (75.60kg/hr). The farm women perceived lesser drudgery (Drudgery Score: 13.79) while farming the harvest vegetables, as compared to traditional method (Drudgery Score: 21.38).	
Flower Production System	
Improved Ring Cutter The pinch grip, hand grip fatigue and physiological workload of the farm women were reduced with the improved ring cutter. The sample of the study stated that the while using improved ring cutter, hand fingers can be moved as per the movement of cutter (84%), Pressure is reduced on wrist due when used (88%) and equal percent (83 %) opined that No sprains/pain in nerves and hand and Hand injury was not occurred due to the use of ring cutter.	

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

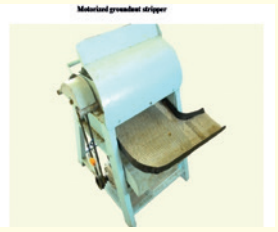
For reducing the drudgery of farm women and for improvement of workstation and gender equity in agro enterprise, improved design were developed through CAD for tools and workstation improvement in food processing enterprise and other allied enterprises.

Mechanized Maize Sheller

- It is labour, time saving and drudgery reducing gender friendly cost effective technology. Only dehusked cobs can be deshelled.
- The work efficiency of improved technology is very high (300 kg /hour) as compared to traditional method with the minimum seed damage (< 2 %).
- The farm women perceived minimum drudgery while working with motorized maize sheller as compared to hand operated maize sheller and traditional method.
- It is suitable for Maize Research Stations and small/marginal farm families.

Motorized Groundnut Stripper

- It is suitable for stripping of immediately harvested groundnut having the moisture content of 18-22 per cent.
- The work effieciency of motorized groundnut stripper was higher (44 kg /hour) than the conventional method (10.50 kg/ hour).
- The percentage of pod damage was very less (< 2 %). It is a cost effective technology against traditional method.
- It reduces the drudgery and postural discomfort of the worker. Hence it is recommended for small and marginal farmers.



Small-scale Mechanized Groundnut Decorticator

- Electrically operated (1 HP motor), It is a low cost drudgery reducing time and labour saving gender friendly technology.
- Higher output capacity (250 Kg / hr) with the minimum seed damage (< 3 %) was observed over traditional method and manual groundnut decorticators. It reduces the occupational health hazards and postural discomfort of the worker.

Electric Motor Operated Bamboo Cutting Machine

- The work efficiency with the use of electrical bamboo cutting machine is higher (40 no./ hour) than the conventional method (20 no./ hour).

Paddy Picker

- Use of paddy picker reduces health hazards of farm women i.e. cuts and wounds.
- It reduces discomfort in upper arm, lower arm, shoulder, low back and wrist of both hands.
- This increases the comfort and work efficiency of the farm women

2.2.7 Comprehensive use of underutilized natural fibres for livelihood families

Awareness among farm women for utilization of agro waste areca nut husk fiber for additional income generation and fabrication in to various textile structures such as woven, nonwoven and composite structures, herbal renewal antimicrobial textile finishes from local plant resources for medical textile and their performance assessment through wear trials, and commercialization of multifunctional natural extracts through systematic and scientific extraction, purification and promotion of use of herbal extracts to enhance the local economy for starting successful venture for rural population were done by AICRP Centre, CAU, Tura.

Development of UV Protective scarf masks was developed by (AICRP Centre, GBPUA&T, Pantnagar)The protective property of clothing against UV radiation has been the subject of considerable research. UV

protection, to a greater or lesser extent, is determined by the fibre type and chemical composition, fabric construction, additives, textile processing aids, colour, and fabric finish. This work focused on enhancing UV-protection properties of cotton fabric through application of herbal finish. Due to growing consumer demand for comfortable, safe and eco-friendly textiles, search for natural sources such as plant extracts with UV protective properties has increased. Jamun leaf extracts came out as excellent natural sources against harmful UV protective rays.

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

The UV protective apron for farm women was developed by AICRP Centre, UAS, Dharwad. Cotton fabric was treated with custard apple leaf extract (20% on weight fabric) with suitable cross linking agent on jigger machine under required Material Liquor Ratio (MLR) and temperature. The treated fabric was used for construction of UV protective farm apron and distributed among the farm women group who are working under different KVKs, ARS and selected departments of UAS, Dharwad. A wear trial was conducted for 2 months and assessed for serviceability, functionality, comfort ability, work efficiency and durability through 4 point scale. Majority of the farm women opined that, fit of the garment, comfortability, functionality was found to be more appropriate and work efficiency was increased. Functionality of the UV treated apron was found to be highly acceptable as compared to existing clothing practices.

UV protective farm apron for farm women

Development of Cotton knitted hand gloves technology
The developed Cotton knitted hand gloves technology by AICRP Centre, PJTSAU was tested in various crops and non-farm activities and proven to be successful. It is evident that, with the use of knitted gloves starting from tagging for variety identification, using sickle during weeding, placing silk and pollen bags using cutter, staple, clips, during harvesting and carrying heavy weight all the activities are been performed with ease.

Fabrication of Cotton rose (*Hibiscus mutabilis*) fibre by two different techniques of Non-Wove and weaving

- Various thermal insulating products namely laboratory oven gloves, domestic oven gloves and thermo-tiffin bag were developed by AICRP Centre AAU and found suitable for their intended use by the respondents. Cotton rose (*Hibiscus mutabilis*) fibre may be a source of natural insulating material for preparation of other functional products in near future.
- Woven fabrics were prepared from cotton rose/Jute blended yarns in basket weave structural design and developed different utility products namely shopping bag, file cover and place mat from woven fabrics and found suitable for their intended use by the respondents.
- Developed sanitary napkins by using Cotton rose fibres as core (100%) mixing with cotton (50:50) at South India Textile Research Association, Coimbatore.

Sanitary napkins by using Cotton rose fibres

- Optimized the process parameters for direct and pad-dry-cure method for antimicrobial finishing on textiles with green extracts of Kharpaat (*Casiaa latalinn*) and Tulsi (*Osimum Basilicum*) and prepared infant clothing from Kharpaat (*Casiaa latalinn*) and Tulsi (*Osimum Basilicum*) treated fabrics and treated fabrics have no adverse effects on the wearers.

  Infant clothing from Kharpaat (*Casiaa latalinn*) and Tulsi (*Osimum Basilicum*) treated fabrics

- Developed five woven product range namely area rug, cushion cover, tapestry, runner and place mat set and assess their acceptability among consumers. Products were well appreciated as well as remarked as good efforts for economic upliftment of the Assamese weavers and also a source of tourist interest.

Development of Sorghum stalks Non-woven materials (Weed Control Mat) The non- woven fabric material was developed by AICRP Centre, TNAU for utilization of agro waste fibres by blending of sorghum and Cotton fibre in the ratio of 50:50 properties using this needle punching technique. The non-woven fabric material was developed by blending of sorghum and PET (polypropylene fibres) in the ratio of 50:50 properties using this thermal bonding technique. Weed Control Mat is a single weed control mat, assisting newly planted seedling to become established. It is made of bio-degradable Sorghum stalks fibre which encourages soil microbial and fauna activity acting as fertilizer after it degrades completely. The sorghum fibre non-woven materials were designed to allow both air and water to drain, reducing the risk of standing water puddles and root rot. This product can prevent the weed from the sunshine to inhibit the photosynthesis, and consequently stopping the weed from growing without using sprays.

Development of herbal treated mask (Guava leaf) The guava leaf extracts with citric acid herbal treated fabric in pad dry cure method was best for the bacterial reduction on up to 15 washes. Cotton Gada fabric was selected for the product development. Double layer mask were developed for herbal treatment. More layers of fabrics will be harder to breathe and the mask will be heavier, feel uncomfortable, especially during summer. Therefore, Two-layer fabric was chosen the mask is lighter and add extra filter inside the mask for better protection. The cotton masks were treated with guava leaf extracts.

Product development by the use of *Calotropis procera* pod fibre pulp and popularizationof the product developed The value added utility products *viz.,* handmade sheet and fabric were developed by using *Calotropis procera* pod fibre pulp by AICRP Centre, MPUAT. Different value added products were developed by using various techniques like macramé, crocheting, sheet making and weaving were found highly acceptable in terms of utility and marketability. Developed products were displayed in the fair organized by Municipal council Devgarh and Nathdwara and acceptability of product and marketability of products were assessed by developed five point rating scale. Among the most preferred, jewellery box secured 1st rank followed by envelop, shopping bag, tea coaster, and telephone mat. In terms of their preference percentage, all articles ranged between 70 to more than 80 percent. Also, a video CD and two Folders were developed on Milk Weed Fibre.

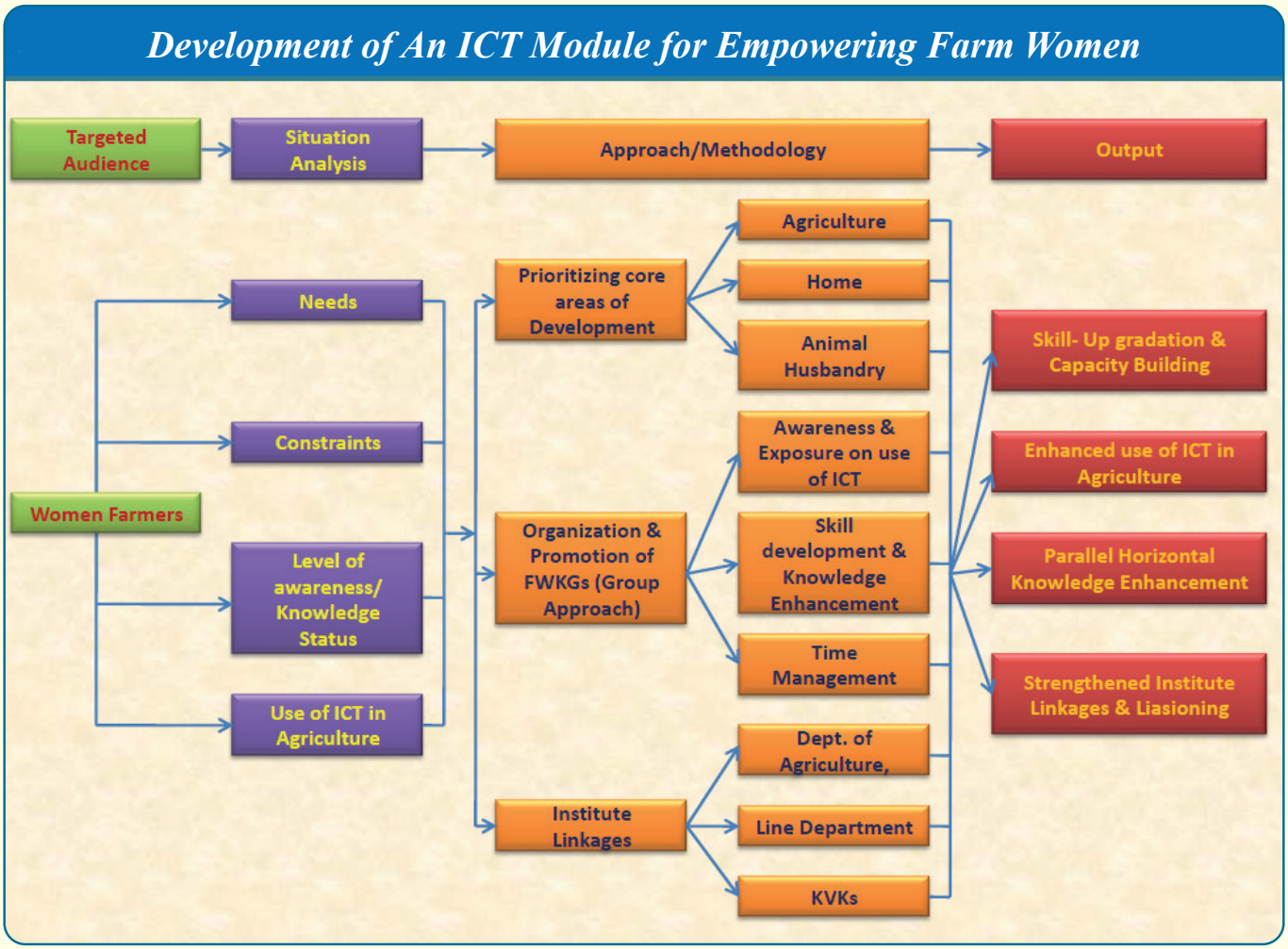
2.2.9 A social pursuit through popularization and product diversification of ethnic crafts on textiles with ICT application

Product diversification and Value addition to Traditional *Kaudi* Art The traditional *Kaudi* designs are contemporized through innovative approach by adopting elements and principles of design *viz.,* shape, size, space and colour to create diversified novel *Kaudi* products to meets the present market demand. The *Kaudi* products are restructured into contemporary form through CAD by introducing design repeat *viz.,*

block repeat, brick repeat, drop repeat, step repeat and all over designs. A range of home textiles *viz.,* Table cloth, Table runners, bed spreads, pillow covers, baby blanket, yoga mats, wall hangings, diwan set and fashion accessories like hand bags, mobile pouch *etc.,* are developed and skill development training are conducted for selected SHGs and women folk for better visibility and commercialization.

2.2.10 Promoting farm women knowledge groups (FWKGs) for enhanced use of ICT in agriculture and allied sectors

Development of ICT Module: An Innovative Approach for empowering Farm Women A Methodology on "Development of ICT Module: An Innovative Approach for empowering Farm Women was developed. The methodology includes constituting six Farm Women Knowledge Groups (FWKGs) involving 60 farm women, their existing needs of the training in particular area i.e., home and farm including animal husbandry. Exposure of the groups was done through WhatsApp messages, WhatsApp videos etc. in identified areas. Their post knowledge was tested through an interview schedule about particular subject and parallel horizontal expansion was also measured through their forwarded WhatsApp messages and videos. Intervention programme on particular subject was carried out through text messages, videos and success stories. Such approach supports in capturing, organizing, synthesizing and retaining information and making it available to other stakeholders. The intervention package includes situation analysis, formation and promotion of Farm Women Knowledge Group, series of intervention programmes, pre and post- test on knowledge and use of ICT tool and follow-up actions. This methodology is unique and will really be very useful for enhancing the knowledge, skill and practices of various stakeholders which includes farmers, farm women, NGO personnel, researchers, scientists, KVK and field level functionaries of extension department, line departments for disseminating technologies and acquiring knowledge.

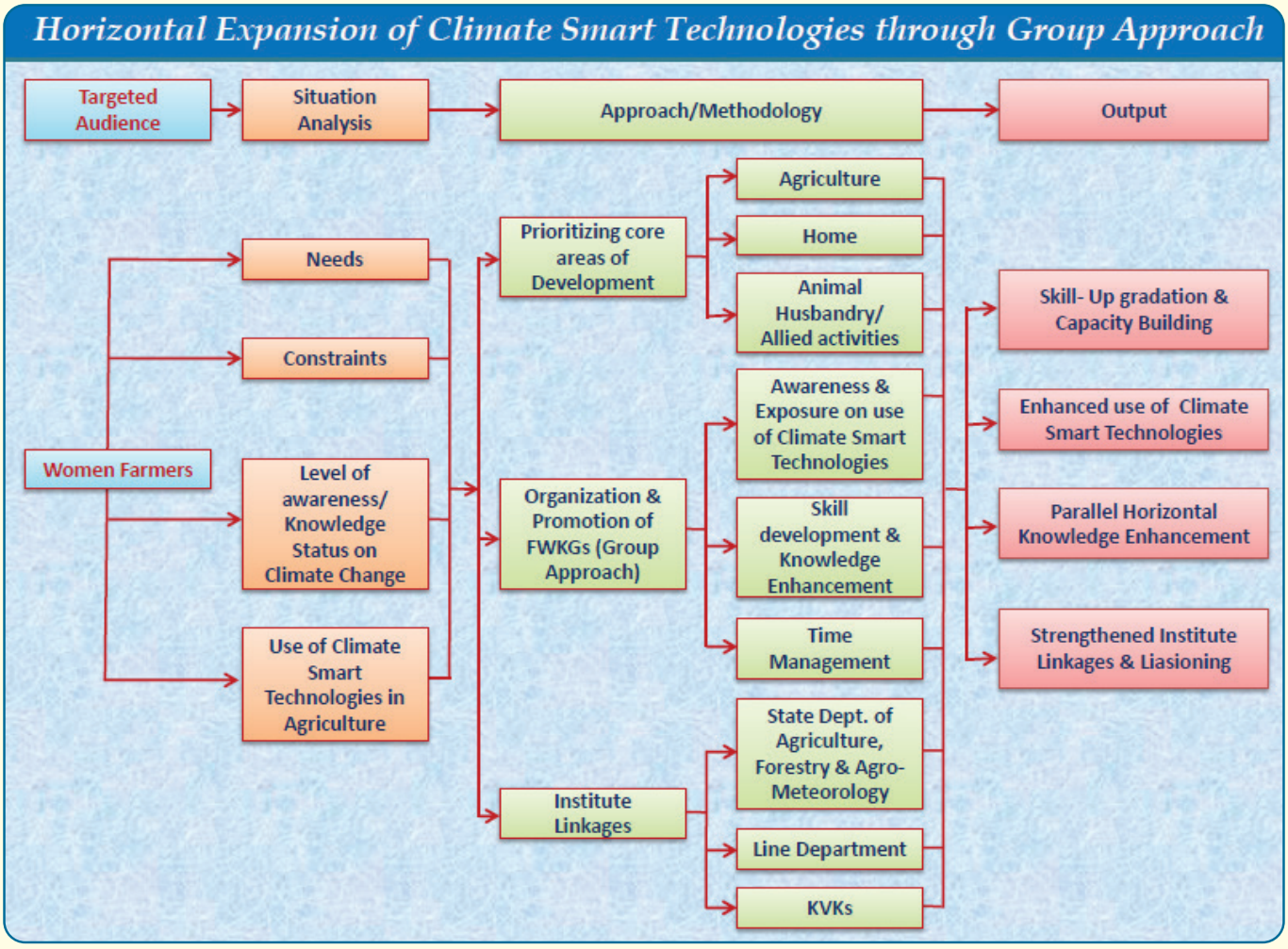


2.2.11. Empowerment of farm women on climate change

Climate Smart Intervention Model: A New Approach for empowering Farm Women A Methodology on "Climate Smart Intervention Model: A New Approach for empowering Farm Women" was developed. The methodology includes constituting six Farm Women Knowledge Groups (FWKGs), their existing awareness and knowledge level was studied about reasons behind climate change, their effects on environment, farming and ecology. It also identified climate smart interventions, to trained farm women and upgrade their knowledge level. Interventions were provided in terms of awareness camps, trainings, demonstrations, WhatsApp messages and videos in the field of cropping pattern, homestead technologies and allied sectors toward establishing climate smart village. Their post-knowledge was tested about climate change. This methodology is unique and will be very useful for enhancing the knowledge, and skills of farm women and other stakeholders for adopting climate smart technologies

2.2.12 Scoping IFS model for gender Perspective with focus on enhancing farm income

Region specific tested IFS models for enhancing farm income The IFS models were selected considering the point of gender perspective. The farm women's involvement was high in crop + dairy + goat + vegetable production + poultry farming system, and earning an additional income from cropping alone was Rs. 30,499/- ; Rs. 44, 774/- from crop + dairy; Rs. 43,778/- from crop + dairy + goat farming and Rs. 65,345/- from crop + poultry farming, respectively. This model was evaluated by AICRP Centre, MPUAT.



3. EVENTS AND ACTIVITIES

3.1 Constitution Day and Citizen Duties Campaign

(17 January, 2020)

Awareness of school students of Government High School, Baramunda on fundamental duties was conducted on 17th January 2020. An invited lecture by Prof.Y.P.Singh, Law and Registrar of the National Law University, Odisha was arranged on important constitutional amendments and its significance on 20th February 2020 through digital mode. Ambedkar Jayanti was observed by the staff of ICAR-CIWA on 14th April 2020 by reading out the preamble to Indian constitution and the fundamental duties of Indian citizens along with their family members in their respective homes under nationwide lockdown due to COVID-19 situation. The activity was observed by following social distancing and other appropriate protocols. An invited online lecture on "Forest Rights – A Legal Perspective of Indigenous Peoples' Right to Agriculture" by Dr. Kumarjeeb Pegu, Assistant Professor of Law at School of Law, KIIT-Deemed University was organised on 16th September 2020 in connection with the observation of Constitution Day and Citizens' Duties Campaign (26th November 2019- 26th November 2020). ICAR-Central Institute for Women in Agriculture celebrated the Constitution Day on 26th November 2020. As a part of the programme, the staff of the institute joined the reading of Preamble to Indian Constitution at 11.00 a.m through the india.gov.in portal. An invited online lecture on "KYC- Know Your Constitution: Rights and Duties" by Advocate Archana Mishra, State Defence Counsel, Bhubaneswar was also arranged for the benefit of the staff of ICAR-CIWA.

3.2 Poultry Fair 2020

(18 January, 2020**)**

Poultry Fair was organized at Village Nuasahi in Puri district on 18 January, 2020. Interface with farmwomen was facilitated and feedback was collected on technological interventions of ICAR-CIWA. Many farm women shared their success stories of poultry rearing and other technology adoption. About 50 farm women who received the training earlier on improved poultry rearing practices on entrepreneurship mode for additional income generation, participated in the fair, and displayed the birds. During earlier programmes, poultry chicks, feed, medicines for disease management and other infrastructural materials for poultry housing were distributed to the participants. The poultry birds attained an average body weight of 2 kg at 12 weeks of age, and most of the women sold male birds, earning an income of Rs. 5000/- from selling about 20 birds. On this occasion, awareness was created about the nutritional significance of egg consumption among farmwomen and children by distributing boiled eggs to them.

3.3 Krushi Odisha 2020

(20-24 January, 2020)

ICAR-CIWA participated in the State Agricultural Fair organized by Department of Agriculture and Farmers' Empowerment, Government of Odisha and Federation of Indian Chambers of Commerce & Industry (FICCI) from 20-24 January 2020 at Janta Maidan, Bhubaneswar, Odisha inaugurated by Hon'ble Chief Minister of Odisha Sh. Nabin Pattnaik. ICAR-CIWA exhibition pavilion was put up with the display of posters, specimens, models and literature on gender-friendly technologies

and more than 1500 farmers and farm women from different districts of Odisha visited the CIWA stall. Dr. N. S. Rathore, Hon'ble Vice Chancellor, MPUAT, Udaipur, Rajasthan, Dr. S. K. Srivastava, Director, ICAR-CIWA, Dr. H. Pathak, Director, ICAR-NRRI, Cuttack, Dean, Extension, OUAT, Bhubaneswar and In-charge, ICAR-CARI (Regional centre, Bhubaneswar) also visited the stall and appreciated the presented technologies.

3.4 Technology Demonstration Mela and 25th Foundation Day

(17 February, 2020**)**

ICAR-CIWA celebrated its Foundation Day on 17 February 2020. On this occasion, a series of activities were organized viz; (i) Foundation Day Lecture (ii) Technology Demonstration Mela (iii) Inauguration and Prize distribution to progressive farmwomen (iv) Scientists-Farmer Interface(v) Cultural evening at ICAR-CIWA. The Foundation Day lecture was delivered by the Chief Guest, Dr. P. K. Agarwal, Vice Chancellor OUAT, Bhubaneswar. Dr. Khageswar Pradhan Ex-VC, OUAT and RAU Bikaner and Dr. Krishna Srinath, Former Director, ICAR-CIWA were the Guest of Honour. Dr. S. K. Srivastava, Director, ICAR-CIWA highlighted the various achievements of the institute for the 2019-20 and its contribution towards the empowerment of women and enhancement of economic and nutritional security of farm families through its extensive research and extension activities.

Dr. P. K. Agarwal during his address emphasized upon the dietary consumption pattern of women in the grass root level, noting the importance of micronutrients in health aspect of women and Dr. Krishna Srinath, Former Director ICAR-CIWA, highlighted to work with dedication and positive spirit for the visibility of the institute at international level. The Technology Demonstration Mela was also organized. Various drudgery reducing women friendly small tools and other technologies suitable for women like backyard poultry rearing etc. were displayed. The function was attended by 150 farm women from the Institute project villages and Dalit Vikas Samitti covering Puri, Cuttack, Ganjam and Jagatsinghpur districts of Odisha. On this occasion, 12 progressive farm women were also felicitated for their outstanding contributions in the field of agriculture, horticulture, dairy farming, duckery, goatery, poultry, aquaculture, mushroom farming and bee-keeping.

3.5 National Science Day

(28 February, 2020)

ICAR-CIWA celebrated National Science and on this occasion, Dr. Sanjay Kumar Dash, Dean CAET, OUAT was the Chief Guest. The programme was attended by 30 farm women from Sakhigopal block of Puri district in Odisha. Dr. Dash, interacted with farm women by giving them household examples in which science plays an important role. Queries of farm women regarding the facts and myths in the food processing were also clarified by him. On this Occasion summer seed kit (pumpkin, bitter gourd etc) were distributed to all the farm women. In the technical session lectures on Family poultry farming for ensuring economic and nutritional sustainability was delivered by Dr. A. K. Panda; Local food: A treasure of nutrition was delivered by Dr. Jyoti Nayak and Value addition to food: A scientific way to women empowerment was delivered by Dr. Tanuja Somarajan.

Glimpses of National Science Day celebration

3.6 International women's week

(2-8 March, 2020.**)**

ICAR-CIWA, Bhubaneswar celebrated International Women's Day from 2nd March, 2020 to 8th March, 2020. Several activities were conducted in ICAR-CIWA, Bhubaneswar and all 13 centres of AICRP on Home Science to create awareness on the theme "I am Generation Equality: Realising Women's Rights". During the programme, the focus was on 12 critical areas committed during the Beijing Platform for Action. In the ensuing days slogan writing, elocution, poster making,

essay writing etc. were conducted. The staff of ICAR-CIWA, AICRP, students and farm women participated enthusiastically. On 8th March 2020, Mrs. Pranati Das, Team Leader, UNDP Rural Housing Project insisted the need for proper dissemination of technology as in the present scenario the benefits of the technology are skewed in men's direction. A lecture on "Work life balance: a win-win situation for employees and organisations" was delivered by Dr. Bijay Kumar Swain (Retd.) Professor & Head, Centre for Rural Credit & Development Banking, National Institute of Rural Development Hyderabad. A lecture on the "Importance of meditation in relieving stress" was delivered by Sister B K Hiroj, Brahma Kumari Ishwariya Viswavidyalaya, Bhubaneswar.

3.7 International Day of Yoga

(21 June, 2020**)**

Yoga is an invaluable ancient Indian practice with numerous benefits to both physical and mental health. In view of the highly infectious nature of the virus causing COVID-19, the International Day of Yoga (IDY) on 21st June 2020 was celebrated by the staff members of ICAR-Central Institute for Women in Agriculture, Bhubaneswar at home around the themes Yoga at Home and Yoga with family. The Common Yoga Protocol to be followed was circulated to all the staff earlier. All the staff members actively performed the Common Yoga Protocol either individually or with family within the confines of their homes from 7:00 A.M. to 7:45 A.M. Subsequently, they also performed customized 15-minutes programme on Yoga.

3.8 150th Birth Anniversary of Mahatma Gandhi

(2 October, 2020)

The 150th Birth Anniversary of Mahatma Gandhi Ji was celebrated at ICAR-Central Institute for Women in Agriculture (ICAR-CIWA), Bhubaneswar during the week ending 2nd October, 2020. A painting competition was organized at the Institute on 30 September, 2020.The logo of 150th Birth Anniversary of Mahatma Gandhi, was displayed in prominent places. An essay writing competition on the theme ''Gandhi on Social Issues against Women'' was arranged on 1 October, 2020. The valedictory function of the 150th Birth Anniversary Celebration of Mahatma Gandhi Ji was organized virtually on 2 October 2020. The programme started with the introductory remarks by Dr. S. K. Srivastava, Director, ICAR-CIWA, in which he recited a poem on Father of our Nation. He also highlighted the role of Mahatma on Education, Agriculture, Rural Development, and especially on Women Empowerment. It was followed by an elocution competition on the theme ''Mahatma Gandhi's thoughts on Women Empowerment and Present Scenario'', in which most of the Staff participated with zeal and enthusiasm. All the Staff members paid tribute to Mahatma by reciting poems on Mahatma, and highlighting the quotes and talks on Gandhian philosophies.

3.9 Rastriya Mahila Kisan Diwas

(15 October, 2020**)**

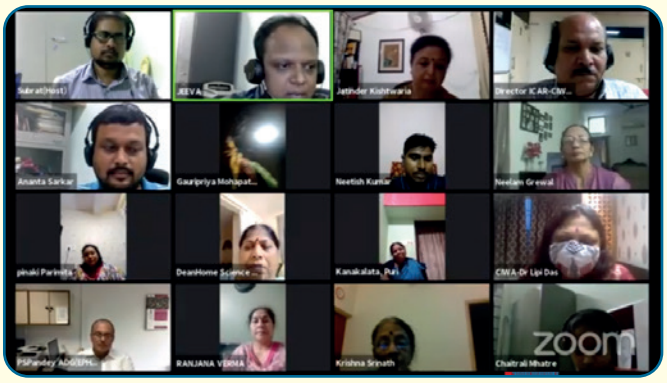
ICAR-CIWA, Bhubaneswar virtually celebrated the *"Mahila Kisan Diwas"* **on 15 October**, 2020. Dr. R.C. Agrawal, Deputy Director General (Agricultural Education), ICAR, chief guest of the programme highlighted the progressive women farmers' contributions in conserving the agro-biodiversity. The Guest of Honor, Dr. P.S. Pandey, ADG (EP&HS), ICAR stressed on utilizing the local resources focusing on vocal for local theme. Dr. Vijaya Khader, Former Dean, Faculty of Home Science, Professor Jayashankar, Telangana State Agricultural University, Hyderabad highlighted the three major roles of women as productive role, service role and nurturing role which are being ignored and not recognized in the society as women farmers. Shri Aditya Kumar Nayak, Director Department of Post Office, Bhubaneswar outlined the various postal schemes aimed at benefiting the women. Dr. S.K. Srivastava, Director, ICAR-CIWA, Bhubaneswar urged the women farmers to develop themselves as entrepreneurs for making the agriculture more profitable and making India *Atmanirbhar*. The Progressive farm women from Odisha, Rajasthan, Uttarakhand and Himachal Pradesh participated in the event. About 100 participants from different states virtually attended the programme.

3.10 World Food Day

(16 October, 2020**)**

ICAR-CIWA celebrated "World Food Day" on 16thOctober, 2020. The theme of the programme was *'Grow, Nourish, Sustain. Together, Our Actions are our Future.'* Dr. P. S. Pandey, ADG (EP&HS), ICAR, New Delhi graced the programme and highlighted the crucial role of farm women in maintaining family food and nutrition

security. He emphasized that empowering women in agriculture and improving their access to inputs, technologies and services can bring phenomenal changes in the present agricultural production scenario of the country specifically in establishing value chains and doubling farmer's income leading towards *Atmanirbhar Bharat*. ICT for women empowerment and technologies to reach out to the farm women for their nutritional empowerment is the need of the hour for livelihood enhancement of women in agriculture. The knowledge and skill upgradation programmes should focus on eradication of malnutrition as urged by Dr. S. K. Srivastava, Director, ICAR-CIWA. Dr. Krishna Srinath, Dr. Neelam Grewal and Dr. Jatinder Kishtwaria, former Directors of the Institute graced the occasion who shared their wisdom on diversification of crops and food, significance of bringing more area under coarse grains, establishing kitchen gardens and community gardens, strengthening storage facilities and market linkage for increasing the shelf life of vegetables for overall improvement of livelihood of farmwomen.



Virtual meeting

Five progressive farm women and leaders of Women Farmer Producer Organizations Mrs. Bhagabati Gadaba, MD Chitridora FPC, Koraput; Ms. Pinaki Parimita, Astaranga, Puri; Mrs. Gouripriya Mohapatra, Nimapada, Puri; Mrs. Kanaklata Panda, Sakhigopal, Puri and Mrs. Anusuya Beura, Padasahi, Khordha shared their experiences during the online programme. Scientists from AICRP (HS) and all staff of Institute participated in the live telecasted programme on YouTube.

3.11 Vigilance Week

(27 October - 2 November, 2020**)**

ICAR-CIWA, Bhubaneswar observed the Vigilance Awareness Week-2020 from October 27th to 2nd November, 2020 with a theme of **"Vigilant India Prosperous India"**. Dr. S.K.Srivastava, Director, ICAR–CIWA administered the vigilance pledge to all the staff members and explained importance of the events. The scientists, administrative and technical staff of the Institute had participated in the pledge on 27.10.2020. A Seminar Talk was organized on 29.10.2020 on **"Vigilant India Prosperous India"** by Mr. I.B.Kumar, Senior Administrative Officer of ICAR-CIFA, Bhubaneswar to create awareness to make India corruption free. For more publicity and sensitization among citizens, about 220 messages on Vigilance Awareness Week-2020 were transmitted through Whatsapp, ICAR CIWA Facebook and Twitter. The hand out on "Effects of corruption in public life" was shared with the staff members. The activities like Quiz and Debate competitions were organized for the staff as well as their family members on 30th October 2020 and 2nd Nov.2020 respectively. The valedictory function was conducted on 2nd October 2019 in which the winners of various competitions were awarded e-certificates.

3.12 Agricultural Education Day

(3 December, 2020**)**

ICAR-CIWA, Bhubaneswar observed 'Agricultural Education Day' on 3 December, 2020 with the students and teachers of Govt. Nodal High School, CRP, Baramunda, Bhubaneswar and DAV School,

Pledge taking

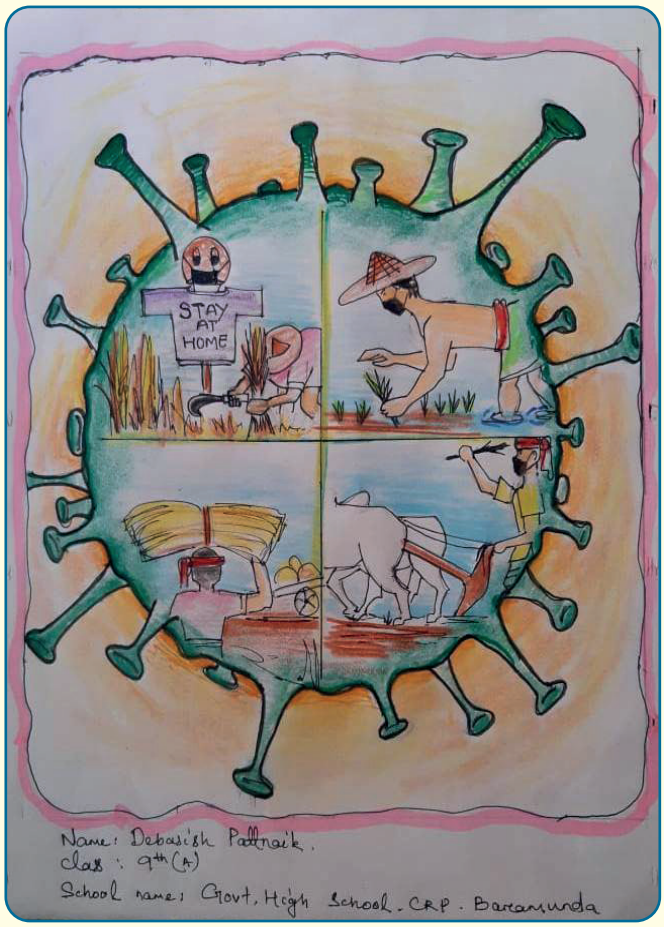
Kalinga Nagar, Bhubaneswar in virtual mode. Drawing competitions on 'Importance of farming during COVID Pandemic' and 'Role of Farmers during pandemic' was organized among school students. Dr. S. K. Srivastava, Director, ICAR-CIWA, enlightened the students on various career possibilities in the field of agriculture and its importance in the sustainability of life and growth of Indian economy. Scientists of ICAR-CIWA interacted with students and briefed about various scopes in agriculture and allied sector to select as a vocations and also emphasised the students on importance of agriculture.

3.13 Women in Agriculture Day

(4 December, 2020**)**

ICAR-CIWA, Bhubaneswar observed Women in Agriculture Day in Virtual mode on 4 December 2020. More than 100 women from 20 adopted villages under Mera Gaon Mera Gaurav villages participated in the

programme. Dr. P. C. Lenka, Member RAC, ICAR-CIWA, guest of honour of the function, encouraged the women to take up various income generating activities in agriculture like mushroom farming, bee keeping vegetable cultivation etc. for enhancing the income and achieving economic independence. Dr. S. K. Srivastava, Director, ICAR-CIWA briefed women regarding govt. schemes for income generation and encouraged them by giving examples of top10 successful women entrepreneurs in India. During this occasion, Rangoli competitions was organized among the women while celebrating the worship of Goddess Laxmi by offering first harvested rice from their own field.



Painting competition among the school students

3.14 Kisan Diwas

(23 December, 2020**)**

Kisan Diwas was celebrated at ICAR-CIWA, Bhubaneswar on 23rd December 2020 during the campaign on "Swachhata Pakhwada" being observed by the Institute. The programme was celebrated in the memory of the former Prime Minister Chaudhury Charan Singh on his birthday. The programme was organized by Dr Anil Kumar, Pr. Scientist in virtual mode in which farm women and farmers from different districts of Odisha like Puri, Cuttack, Khorda, Jagatsinghpur, Ganjam, Nayagarh etc. and the staff of ICAR-CIWA participated in the meeting. The meeting was graced by Dr S.S. Singh, Director Extension, Rani Lakshmi Bai Central Agricultural University, Jhansi who highlighted the life and the significant works for the welfare of farming community done by Late Chaudhary Charan Singh. The Director ICAR-CIWA, highlighted the role of the Institute in sensitizing the various stakeholders engaged in agriculture citing several examples from the field where ICAR-CIWA has played a major role in economic empowerment of rural women by bringing the relevant technologies to their doorstep. During the programme, about 10 farm women shared their success stories in agriculture and allied sectors which included backyard poultry rearing, nutrition garden, goat rearing, rearing of dairy animals, fish processing, and doubling farm income through a combination of technologies among others. The virtual programme was attended by about 200 farm women and farmers from different places including the staff from the Institute.

4. REVIEW MEETINGS

4.1 Institute Management Committee Meeting

(26 August, 2020)

The 21st Institute Management Committee Meeting was held on 26 August 2020 at ICAR-CIWA in virtual mode. Director, ICAR-CIWA presented the detailed significant achievements of the Institute during last three years highlighting the programmes organized in the institute namely launching of Pradhan Mantri Kisan Samman Nidhi; SAARC Regional Consultancy and inauguration of Technology Block, Women Farmer's Hostel International Extension Congress etc. He also highlighted about the MOUs signed with other Govt. /Developmental organizations for conducting various research activities. The Member Secretary, IMC presented the duly approved proceedings of the 20th IMC meeting and confirmed the minutes of the 20th IMC Meeting. The IMC appreciated the action taken report of the proceedings on the settlement of outstanding audit paras and suggested for continuous persuasion to settle the audit paras.

4.2 Institute Research Council Meeting

(23 September, 2020 and 09 October 2020)

The 20th Institute Research Council (IRC) Meeting of ICAR-Central Institute for Women in Agriculture, Bhubaneswar was held on 23 September, 2020 and 09, October 2020 in virtual mode. The objectives of the meeting was to review the new project proposals, progress of ongoing research projects for the period from April, 2019 to March, 2020, Action taken on the proceedings of the 19th IRC meeting and discuss the future course of action. Dr. P. S. Pandey, ADG (EP&HS), ICAR advised that scientists to formulate projects in networking and problem solving mode in national perspective and to validate the research findings through the AICRP (HS) centers located across the country. ICAR-CIWA should take up a mega project for database development for women in agriculture and should bring out a document on gender mainstreaming. The presentations of the new projects were made under programme mode. The research achievements of the ongoing projects of mid-term plan (2017-2020) for the period of April 2019 to March 2020 were also reviewed.

4.3 Research Advisory Committee Meeting

(28-29 October, 2020)

The 20th Meeting of Research Advisory Committee (RAC) of ICAR-CIWA was held during 28-29 October, 2020 in virtual mode. Dr. V. N. Sharda, Chairman, RAC and Ex-Member, ASRB, New Delhi appreciated the comprehensive presentation of the salient achievements under each of the completed (Institute and externally funded) projects, AICRP (HS) and AICRP (ESA). Director, ICAR-CIWA presented the salient achievements in the past and the future perspectives of ICAR-CIWA. The chairman appreciated the comprehensive presentation. The modified new project proposals of ICAR-CIWA and AICRP (HS) under programme mode were also presented. After discussion, deliberation and modus operandi of various research works along with future perspective of ICAR-CIWA, the Committee made various recommendations. Director, ICAR-CIWA expressed his sincere gratitude to the RAC Chairman and Members for showing their concern for the Institute and offering constructive suggestions for strengthening the research and extension activities of the Institute. The RAC made various recommendations with constructive suggestions for strengthening the research and extension activities of the Institute.

5. EXTENSION PROGRAMMES

5.1 Mera Gaon Mera Gaurav (MGMG)

The flagship programme aimed at creating awareness among farmers about the organization and their programmes, schemes and policies related to the farming sector. Four teams comprising of 6-7 scientific and technical staff were formed and each teamadopted five villages and a total of 20 villages were adopted and provided much diversity areas like Horticulture, Animal Husbandry, Fisheries, Animal Nutrition, Farm Machinery and Power and Home Science. A direct interface with the women farmers was promoted to provide first-hand information and solutionsdeveloping awareness on climate change, customized services, protective measures, FPOs, SHGs, etc. alongwith increasing adoption rate of newer technologies by the farming communities. Keeping in view the safety of farm women and effective management of COVID-19 pandemic, physical interaction and visits were avoidedhelp of cellular and telephonic connectivity was undertaken. Various online seminars, webinars and meetings were organized by the Institute and mobile advisories were forwarded to beneficiaries on different subjects.

The four teams of MGMG also issued guidelines and advisories related to various crop cultivationtheir management and post-harvest methods for income enhancements. The adopted villages were also issued advisories regarding COVID-19 guidelines in line with the government alongwith development of awareness on safety issues during the pandemic through Whatsapp providing suitable solutions through mobile application. The beneficiaries were identified amongst the MGMG villages. Various interface programmes and distribution of small women friendly drudgery reducing farm tools and implements like hand hoe, Khurpi, Sprayer, Rose can, Secateurs etc. were also made among the women farmers in adopted villages under MGMGspecially to SC women farmers as beneficiaries. Scientists visited to one of the identified villages where 100 members of farming families were addressed. A total of 1135 women farmers participated in 21 *gosthis* conducted virtually during various occasions. During the year, 905 participants had received inputs/technical back stopping/introduced to women friendly technologies, 220 farmers were addressed through 43 mobile based advisories, 78 farm-based literatures benefitting 2840 farmers were distributed to farm women. While keeping in mind the safety and norms for effective management of COVID -19 pandemic, physical interaction with the adopted villages and women farmers was not possible. In this context, various online seminars, webinars and meetings were organized by the Institute. Mobile advisories were forwarded to beneficiaries on different subjects. Small women friendly farm tools and equipments were provided under SCSP programme to SC women beneficiaries

Table-5.1.1 Activities Conducted

Sl. No.	Name of Activity	No. of Farmers/Women Farmers Participated & Benefitted
1.	Visit to village by teams	Visits were made to the identified villages where 100 members of farming families were addressed.
2.	Interface meeting/*Gosthies*	1135 farmers and women farmers participated in 21 *gosthis* conducted virtually during various occasions.
3.	Facilitation for new varieties, seeds, technology	905 participants had received inputs/technical back stopping/ introduced to new and women friendly technologies.
4.	Mobile based advisories (No.)	220 farmers and women farmers were addressed through 43 mobile based advisories.
5.	Literature support provided	78 farm-based literatures benefitting 2840 farmers were distributed
6.	Other Activities Organized under Special Programme	Special days like Women in Agriculture Day, International Women's Day and others were observed by including the women farmers online through virtual meetings. 3 linkages was also developed benefitting 800 farmers/women farmers.

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 viz. 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 were undertaken. 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.

Table-5.1.2. Number of Programmes & SC women beneficiaries (SCSP)

Type of Programme	No. of Programmes	No. of SC Women Beneficiaries
Skill Upgradation + Input Distribution	1	55
Input Distribution	9	390
Total	10	445

5.3 Swachha Bharat Abhiyan (SBA)

The Swachha Bharat Abhiyan was integrated with technology transfer programmes of the institute in PAN India mode to create awareness campaign in adopted villages involving farm women and farmers, youth etc. Swachhta Pakhwada campaign was organised in the institute during 16-20 December, 2020, through virtual mode and was promoted following social distance and guidelines of COVID. The activities carried out during the period included mass plantation programme, 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, white washing and painting works in office premises, generation of wealth from waste, polythene free status, composting of kitchen and home waste materials, promoting clean and green technologies, organic farming practices in kitchen gardens of residential colonies.

A debate competition on "Cleanliness is next to Godliness" was organized amongst the staff members of ICAR-CIWA. Drawing competition and essay writing competition were also organized among the school going children of MGMG villages and children on Swachha Bharat, Swasth Bharat and Importance of cleanliness for preventing Corona pandemic.Visits were made to community waste disposal sites/ compost pits, working in Bhubaneswar municipality area by the staff of ICAR-CIWA. For proper disposal of non-degradable waste importance of recycling waste was emphasized. Minimizing the use of plastic bags in daily life was emphasized and segregation of waste in to degradable and non-degradable was demonstrated. In the valedictory programme, Sh. Ananta Narayan Jena, Hon'ble MLA appreciated the various activities and stressed upon the participants to develop awareness among people to avoid single use of plastic, open defecation and use of toilets, proper disposal of non-degradable and e-waste, plantation of trees etc. ICAR-CIWA used to demonstrate *Swachchta* campaign regularly in villages in which awareness creation was carried out on general hygiene and sanitation, better sanitation practices like using toilet, hand washing, health and hygiene awareness etc. Door-to-door meetings were also conducted to drive behavioral change with respect to sanitation behaviour. Mobilization of community for building compost bits were also carried out and imparted training on 'organic waste management for production of farm made manures'.

6. राजभाषा

आज के युग में विज्ञान के ज्ञान को जनसाधारण तक पहुँचाना बेहद जरुरी है| जीवन के हर क्षेत्र में विज्ञान बसा है| भारत ने विज्ञान द्वारा जीवन के प्रत्येक क्षेत्र में आशातीत प्रगति की है| भारत जैसे विशाल देश में वैज्ञानिक जानकारियौ को जनप्रिय भाषा में समझाने के लिए राजभाषा हिंन्दी ही एक भाषा है, जिसके माध्यम से वैज्ञानिक उपलाब्धियों को जन-जन तक सफलतापूर्वक पहुचाने का कार्य भा.कृ.अनु.प.-केन्द्रीय कृषिरत महिला संस्थान,भुबनेश्वर प्रयाश कर रहे है| भुवनेश्वर में स्थित सात वैज्ञानिक अनुसंधान संस्थानों के संयुक्त प्रयास से प्रति वर्ष एक हिंन्दी में संयुक्त वैज्ञानिक संगोष्ठी का आयोजन किया जाता है| वर्ष २०२० संगोष्ठी का शीर्षक – "जलवायु परिवर्तन के कुप्रभाव को रोकने में बैज्ञानिक तथा तकनिको संस्थानों की भूमिका " था| इस संगोष्ठी १० जनवरी २०२० विश्व हिंन्दी दिवस के अवसर पर सभी संस्थान के निदेशको के उपस्थित में जीव विज्ञान संस्थान में मनाया गया| इस संगोष्ठी में प्रति संस्थान से दो वैज्ञानिक वक्ताओं ने उपरोक्त शीर्षक से अपने अपने वक्तव्य हिंन्दी में प्रस्तुत किए तथा सभी सात संस्थानों से वैज्ञानिक/ तकनिकी कर्मचारी/ प्रशासनिक कर्मचारी ने इस संगोष्ठी में बढ़ चढ़ कर भाग लिया| सभी प्रतिभागीयो को प्रमाण पत्र वितरित किया गया | सभी संस्थान के निदेशको के उपस्थित में १० जनवरी शाम ५ बजे संगोष्ठी का समापन आयोजन किया गया तथा समापन समारोह में सभी वक्ताओ को पुरस्कृत किया गया | इसके अतिरिक्त दैनिक शासकीय कार्य में हिन्दी को प्रोत्साहित करने की उद्देश्य से केन्द्रीय कृषिरत महिला संस्थान में दिनांक १४ सितम्बर, २०२० से १३ अक्टूबर, २०२० हिन्दी चेतना मास का सुभारंभ निदेशक महोदय की अध्यक्षता में (ऑन-लाइन) आयोजित किया गया | शुभारम्भ के दिन एक कार्यशाला की आयोजन किया गया| इस कार्यशाला में निर्देशक महोदय ने सभी कर्मोचरियों को हिन्दी में कार्य करने हेतु संबोधित करते हुए सभी का उत्साहवर्धन किया | अपने वक्तव्य में सभी को हिन्दी को स्वेछा से अपनाकर छोटे छोटे लेख तथा कविता लिखने के लिए आग्रह किए | हिन्दी में किस तरह कार्य करेगे तथा अपने कार्य में कैसे अधिक से अधिक हिन्दी को प्रोयग कर सकते है , इस बारे में अवगत कराया |

१ अक्टूबर को सभी कर्मचारी को माननीय कृषि एवं किसान कल्याण मंत्री नरेन्द्र सिंह तोमार जी के संदेश एवं सचिव (डेयर) एवं महानिदेशक (भा.कृ.अनु.प) माननीय त्रिलोचन महापात्र जी के संदेश सलग्न किया गया ताकि सभी कर्मचारी संदेश को पढे तथा हिन्दी की उपोयोगिता को जाने | ६ अक्टूबर २०२० को हिन्दी हिन्दी चेतना मास के उपलख्य मे एक कार्यशाला आयोजित किया गया | इसका विषय था "राजभाषा हिन्दी में सरकारी पत्राचार एवं सरकारी कामकाज में हिन्दी का प्रयोग, मौसौदा टिप्पणियां का व्यवहार" वक्ता श्री रबीन्द्र नाथ चाँद, हिन्दी अधिकारी, AG, कार्यालय, भुवनेश्वर। १३ अक्टूबर राजभाषा कार्यन्नवयन समिति के अध्यक्ष, ICAR-CIWA के निदेशक के उपस्थित में समापन समारोह का आयोजन किया गया | जिस में संस्थान के वैज्ञानिक तथा कर्मचारियो ने कविता पाठ और चुटकुले बोले सभी कर्मचारियो ने हर्षोलास के साथ समापन समारोह में भाग लिए | माननीय निदेशक महोदय ने सभी से हिन्दी में कार्य-करने की आग्रह किया तथा सभी को हिन्दी में लेख लिखने पर वल दिए | अंत में श्रीमति गीता साहा, प्रभारी हिन्दी अधिकारी ने समस्त वैज्ञानिक और कर्मचारीगण को हिन्दी भाषा के प्रचार प्रसार में सभी कर्मचारी को आगे आने केलिए आग्रह किए एवं हिन्दी भाषा में कार्य करने के लिए अनुरोध किए तथा सभी कर्मचारी को धन्यवाद देते हुए समारोह समापन किया |

हिन्दी भाषा राष्ट्र की भाषा प्रजातंत्र के शास्त्र की भाषा,
देवनागरी लिपि में भाषा जन-जन के मन की अभिलाषा |

7. AWARDS AND RECOGNITIONS

S. K. Srivastava

- Member, Academic Council, Gandhi Institute of Engineering & Technology University (GIET University), Gunupur, Odisha.
- Co- Chair of Session V "Rice for livelihood security, equity and profitability" of the 1st Indian Rice Congress on 9 December, 2020
- Member, Gender Budget Cell, DARE-ICAR, New Delhi on 1 December, 2020.
- Appreciation letter from Dr A K Vyas, ADG (HRM) & Training Manager, ICAR for providing training opportunity to 100% staff as per Policy of ICAR.
- Expert Member for the Selection Committee of a post of Professor in OUAT Bhubaneswar under BPCL sponsored Biofuel Project on 3 September, 2020.
- Member of national steering committee for "KRITAGYA – a national level hackathon promoting farm mechanization" organized by ICAR-NAHEP and Agricultural Engineering Division, ICAR. 29 August, 2020.
- Patron, webinar on "Shifting paradigm of COVID-19 on agriculture and food systems- implications and future strategies" organized jointly by TNAU, CSC&RI, MDU & ICAR-CIWA, Bhubaneswar on 17 August, 2020.
- External Examiner for evaluation of Ph.D. thesis viva-voce examination on 10 June, 2020 at OUAT, Bhubaneswar.
- Lifetime Achievement Award during 4th International Scientist Award on Engineering, Science and Medicine, VDGOOD Professional Association, Technology Factory, Chennai, February, 2020.

A.K. Panda

- 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 (National).

Lipi Das

- Best Presentation Award during the 1st Indian Rice Congress-2020 organized by Association of Rice Research Workers from 8-9 December, 2020
- Convener, Broad Subject Matter Area (BSMA) for Social Science (Agril Extension, Economics and Agri-Business Management), ICAR, New Delhi.
- 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.
- Received Best Externally Aided Project Award on "Increasing productivity and sustaining the rice-based production system through FFP approach" during the Platinum Jubilee Foundation Day Celebration of ICAR-NRRI, Cuttack.
- External Examiner for Ph. D thesis evaluation of Agriculture Extension of SKRAU, Bikaner.
- Developed one rice variety, namely, CR Dhan 407 (Mahamani)) as an associated scientist under the Principal Breeder Dr. S.K. Pradhan of ICAR-NRRI, Cuttack which was released and/or notified by SVRC, Odisha.

B. Sahoo

- External examiner of 4 M.V.Sc students (Animal Nutrition) at College of Vety. Sciences, OUAT, Bhubaneswar held on 28.09.2020
- Co guide of one M.V.Sc student (Animal Nutrition) at College of Vety. Sciences, OUAT
- Reviewer, Animal Nutrition Feed Technology (National)
- Reviewer, Biological trace element research (International)
- Reviewer, Tropical Animal Health production (International)
- Reviewer, Range management and Agroforestry (National)
- Reviewer, Asian Journal of Research in Animal & Vety. Sciences (International)

Ananta Sarkar

- Reviewer of the journal Agricultural Research (Electronic ISSN 2249-7218).

Praveen Jakhar

- Member, DPC, Administrative promotion.
- Editor, Indian Journal of Soil Conservation, Dehradun.
- Innovative Article Award for publication in Agriculture & Food: e-Newsletter.
- Reviewer, Indian Journal of Agronomy, New Delhi
- Reviewer, Annals of Agricultural Research, New Delhi

Sachidananda Swain

- Received best book award by Indian Society of Agricultural Engineering (ISAE) during 54th ISAE Annual Convention held at Pune, Maharashtra, India during 7-9 January, 2020.
- External examiner for evaluation of M. Tech. thesis

viva-voce examination on 14 September, 2020 at CAET, OUAT, Bhubaneswar.

- Member, Editorial Board of Amity Journal of Agribusiness.
- Member, Reviewer Board of the Journal of Basic and Applied Science.
- Treasure of the Journal of Andaman Science Association (JASA).
- Reviewer of Asian Plant Research Journal.
- Reviewer of Asian Journal of Agricultural Extension, Economics & Sociology.
- Reviewer of Asian Journal of Advanced Research and Report.

Tania Seth

- Reviewer Award-(2018-19)" for valuable contribution as Reviewer of Indian Phytopathology journal by Indian Phytopathological Society, New Delhi.
- "Innovative Article Award" for popular article published in Agriculture & Food: e-Newsletter.

Gayatri Moharana

- Received third prize in Technical Session- IV, during International Web-Conference On "New Trends in Agriculture, Environmental & Biological Sciences for Inclusive Development (NTAEBSID-2020) 21-22 June, 2020.

Tanuja S.

- Best oral presentation award in International web conference on "New Trends in agriculture, environmental and biological sciences (NTAEBSID)" during 21-22 June, 2020.
- Young woman fisheries scientist award by Agro Environmental Development Society in 2020.
- Young scientist award by Vigyan Varta in 2020.
- Reviewer of the Indian Journal of Fisheries, Fishery Technology and Waste and Biomass Valorization.

Encouraging enterprise system among women

POST NEWS NETWORK

Bhubaneswar, August 24: In order to help the rural women SHGs to start enterprises, the ICAR-CIWA (Central Institute For Women In Agriculture) Bhubaneswar recently launched a project titled 'Adding Value to Fish: a Potential Livelihood option for Rural Women of Odisha' funded by Department of Scientific and Industrial Research (DSIR).

Under this project, a group of rural women from Kanamana Village in Astaranga block of Puri district in Odisha was given hand holding support for starting the enterprise. They were imparted training on the preparation of value added fish products, attractive packaging and labelling, entrepreneurship development, management, branding and marketing, group dynamics and book keeping.

These products prepared by women SHGs under the brand name Fishlikes are now available at Falcon Fresh Retail outlets. S.K. Srivastava, Director of ICAR-CIWA launched the products at the outlet Monday.

With the shift in consumers' demand for ready-to-eat hygienic products, value added products' preparation from fish holds a key potential.

In this background, the project funded by Department of Scientific and Industrial Research (DSIR) viz., 'Adding Value to Fish: a Potential Livelihood option for Rural Women of Odisha' was implemented at ICAR-Central Institute for Women in Agriculture, Bhubaneswar, said Srivastava.

Facilitation for obtaining FSSAI licence which is mandatory for any food products was done earlier. They have ventured into online marketing taking into consideration the pandemic situation after obtaining the trade license under the brand name "Fishlikes".

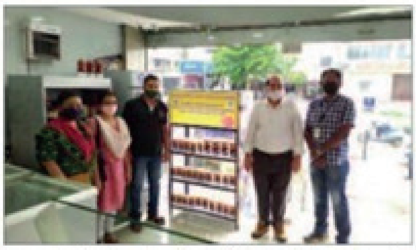
The Project team from ICAR-CIWA trained the groups to start value added fish products based enterprise and facilitated their market linkage and procurement of licenses.

OrissaPOST

ରିଟେଲ ଫିସ୍ ଆଉଟ୍‌ଲେଟ୍, ମାର୍କେଟ ଲିଙ୍କେଜ୍ ଶୁଭାରମ୍ଭ

'Fishlikes' by SHG and Falcon launched

STATESMAN NEWS SERVICE
BHUBANESWAR, 24 AUGUST:



Dr S K Srivastav, director ICAR-CIWA launched the first marketing outlet set up for a rural women SHG by linking the value added products under the brand name "Fishlikes" with Retail Fish Supply Chain (Falcon Fresh Retail outlets) in Bhubaneswar.

In the modern times, with the shift in consumers' demand for ready to eat and hygienic products, value added products preparation from fish holds a key potential.

Under this backdrop, the project funded by Department of Scientific and Industrial Research (DSIR) viz., "Adding Value to Fish: a Potential Livelihood option for Rural Women of Odisha" was implemented at ICAR-Central Institute for Women in Agriculture, Bhubaneswar.

Under this project, a group of rural women from Kanamana Village in Astaranga block of Puri district in Odisha, belonging to the Biswa Bharati Maa SHG was given hand holding support for starting the enterprise.

They were imparted training on the preparation of value added fish products, attractive packaging and labelling, entrepeneurship development, management, branding & marketing, group dynamics and bookkeeping.

Facilitation for obtaining FSSAI licence which is mandatory for any food products production was done.

They have ventured into online marketing taking into consideration the pandemic situation after obtaining the trade license under the brand name "Fishlikes". The Project team from ICAR-CIWA, Dr. Tanuja, PI of the DSIR funded project and Dr. J. Charles Jeeva, Pr. Scientists from ICAR-CIWA trained the groups to start value added fish products based enterprise and facilitated their market linkage and procurement of licenses.

The Statesman Tue, 25 August 2020 https://epaper.thestatesman.com/c/544

8. PUBLICATIONS

PUBLICATIONS (ICAR-CIWA)

Research Papers

1. Abirami, K., Swain, S. and Baskaran, V. 2020. Phytochemical screening and diosgenin analysis of *Costus speciosus* (J. Koenig) Sm: an important medicinal plant of Andaman and Nicobar islands. *The Pharma Innovation Journal*, **9**(9): 228-231.
2. Baishya, M., Sarkar, A. and Argade, S. 2020. Problems concerning women's participation and dropout from self-help groups in Koraput district of Odisha. *International Journal of Current Microbiology and Applied Sciences*, **9** (6): 3180-3186. https:// doi.org/ 10.20546/ ijcmas. 2020.906.380 (KRISHI URI: 46318)
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13. Tanuja, S. 2020. Fisheries technologies for livelihood and nutrition. Organized by department of Zoology, School of Applied Sciences, Centurion University of Technology and Management. October 20, 2020. (Oral Presentation)
14. Tanuja, S., Sarkar, A., Moharana, G. and Mhatre, C.S. 2020. Improving household fish availability and income through homestead aquaculture. International web conference on new trends in agriculture, environmental and biological sciences (NTAEBSID) 21-22, 2020: 113. (Oral Presentation)
15. Tanuja. S., Jeeva, J.C. and Rout, E. 2020. Demand for value added fish products in urban Odisha. International conference on novel approaches in agro ecology, forestry, horticulture, aquaculture, animal biology and food sciences for sustainable community development. Agrotech 2020. June 14, 2020: 15. (Oral Presentation)

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20. Sabharwal, K., Candy, Y. and Yadav, B. 2020. A study on awareness and use pattern of information and communication technology among rural farmers. *International Journal of Chemical Studies,* SP-**8**(3): 286-289.
21. Sabharwal, K., Candy, Y. and Yadav, B. 2020. Awareness on indicators and causes of climate change among rural farm women in Hisar district of Haryana. *Indian Journal of Extension Education*, **56**(1): 209-211.
22. Sangwan, V., Rani, V. and Punia, D. 2020. Food consumption pattern and dietary intake of obese vs non-obese women. *Journal of Pharmacognosy and Phytochemistry*, **9**(4S): 550-554.
23. Sonia, L., Bhattacharyya, N. and Kalita, M. 2020. Problems faced by farmers while using different agricultural hand tools and implements. *Research Journal of Agricultural Sciences*, **11**(2): 491-493.
24. Tiwari, G. and Jain, S. 2020. Reproductive health and wellbeing complementary to each other. *Asian Journal of Home Science*, **15**(2): 35-40.
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Lead / Invited Speaker (ICAR CIWA)

S. K. Srivastava

1. Talk on "Different methods of composting and vermicomposting" on 7 July, 2020 during online training program on "Organic Farming" organized by Regional Centre of Organic Farming, Bhubaneswar during 6-12 July, 2020.
2. Talk on "Wellness management for boosting immunity during COVID-19" on 5 July, 2020 during a national webinar series on "Immuno-nutrition, wellness management and livelihood change" organized during 3-5 July, 2020 organized by AICRP on Women in Agriculture, Directorate of Research (Agri) Assam Agriculture University, Jorhat in Association with ICAR-CIWA, Bhubaneswar.
3. Eminent Speaker during NAHEP- national e-Training on "Indian agricultural education system and entrepreneurship scope in 21st century" during 5-14 August, 2020 at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, M.S.

Sabita Mishra

1. Lead Speaker during national workshop on "Gender issues and atmanirbhar Bharat in agriculture" at CAU, Imphal on 15 October, 2020.
2. Speaker for "Agricultural extension strategies for empowering farm women" on the occasion of Mahila Kisan Diwas at IMAGE, Bhubaneswar on 15 October, 2020.

A.K. Panda

1. Invited speaker to deliver lecture on "Augmenting productivity of dairy animals through balanced feeding" on 8 January, 2020 in the Entrepreneurship Development Programme in the Dairy Sector (NAHEP-IVAR) at College of Veterinary Sciences & Animal Husbandry, OUAT Bhubaneswar from 2-24 January, 2020.
2. Invited speaker to deliver lecture on Procurement of ingredients, quality control and preparation of mineral mixture in the skill development programme on Mineral mixture production for Livestock (NAHEP, ICAR) conducted in the College of Veterinary Sciences & Animal Husbandry, OUAT Bhubaneswar from 11th to16th March 2020.
3. Invited speaker to deliver presentation on Poultry Health and Management on 9 March 2020 during the training programme of Animal Health worker sponsored by Agriculture Skill Council of India (ASCI) from 10th February 2020 to 18th March 2020.
4. Invited speaker to deliver lecture on Nutrition for Optimum Production in Layers on 11 October 2020 in the webinar on "Layer Poultry Production and Management" during 10-12 October 2020 conducted by CPDO Mumbai.
5. Invited Speaker to deliver presentation on Food and Nutrition for Sound Health during Webinar on ''Effective Health Management for Enhancing Work Efficiency of Employees'' conducted by ICAR-CIWA on 20 November, 2020.

Lipi Das

1. Delivered a lecture on "Gender Mainstreaming through Value Chain: An innovative Entrepreneurial Approach" in seminar during Krushi Odisha-2020 on "Enhancing Role of Women SHGs for Agricultural Profitability" at Janta Maidan, Bhubaneswar.
2. Presented a lead paper on "Youth lead agriculture: Key to modernization in Agriculture and National Food Security" on 03.07.2020 in National Webinar series on "Immuno- Nutrition, Wellness Management and Livelihood change organized by ICAR-CIWA and AICRP Centre, AAU, Jorhat during 3-5 July, 2020.
3. Presented a lead paper on " Pandemic and livelihood means of women" in Digital Discourse Series on "Gender and Pandemic: Challenges and Opportunities" on 10-12 August, 2020 organized by ICAR- ATARI, Bengaluru and Farmers FIRST Programme (FFP) of ICAR-CPCRI, Kayamkulam, ICAR-NIANP, Bengaluru10.08.2020.
4. Presented a lead paper on "Promoting Gender Equity in Agriculture through Partnering in Value Chain and Market Linkage" 0n 26.08.2020 during the International Webinar on Women in Science and their role in sculpting Modern Agriculture" organized by BAU, CYMMYT.
5. Presented a paper on "Gender Mainstreaming: A strategic Approach for achieving Gender Equality and Empowerment of women" in National e-conference on "Future of Strategic Technological Innovation and Entrepreneurship Development in Agriculture and Allied Sector for Food and Livelihood Security" organized by SOA, Bhubaneswar on 14.09.2020.

9. TRAINING AND CAPACITY BUILDING

9.1 Training/ Workshop/ Interface/ Exposure Visit/ Field Visit organized

S. No.	Name of the programme and project	Date	Women beneficiaries	Organisers
1.	Adding value to fish: Management Training programme at ICAR-CIWA, Bhubaneswar	16 January 2020	14	Tanuja S. J. Charles Jeeva
2.	Adding value to fish: Management Training programme at ICAR-CIWA, Bhubaneswar	18 January 2020	21	Tanuja S. J. Charles Jeeva
3.	Developing gender sensitive model for doubling farmers' income by addressing gender concerns and technological gaps Poultry Fair at Village Nuasahi, Puri	18 January 2020	50	J. Charles Jeeva Jyoti Nayak B C Behera
4.	Enhancing Income of Rural Women through Improved Goat Rearing at ICAR-CIWA, Bhubaneswar	24 January 2020	27	B Sahoo Anil kumar A K Panda Sabita Mishra Jyoti Nayak
5.	Enhancing Income of Rural Women through Improved Goat Rearing Off campus (Banapur)	7 Febraury 2020	26	B. Sahoo A.K.Panda Anil kumar Jyoti Nayak
6.	Adding value to fish: Skill training to master trainers at ICAR-CIWA, Bhubaneswar	14 February 2020	10	Tanuja S. J. Charles Jeeva
7.	Management training programme at ICAR-CIWA, Bhubaneswar	15 February 2020	35	Tanuja S. J. Charles Jeeva
8.	Exhibition of Value added products prepared by women beneficiaries on Foundation Day of ICAR-CIWA	17 February 2020	10	Tanuja S. J. Charles Jeeva
9.	Capacity Building and Adoption of Technology Programme of NABARD at ICAR-CIWA	25-28 February 2020	20	A. K. Panda Chaitrali S. Mhatre
10.	Awareness on equitable distribution of food in family and awareness on the importance of working together in a team through interactive games among women farmers at ICAR-CIWA, Bhubaneswar	28 February 2020	30	Tanuja S, Chaitrali Mhatre P.K. Rout
11.	Skill based training-cum-interface for farm women at through Institute- Industry-Stakeholders Linkage in Convergence Model at ICAR-CIWA, Bhubaneswar	13 March 2020.	50	Lipi Das B. Sahoo
12.	Skill development training programme on Bee Keeping for farm women of Kadua Village, Satyabadi, Puri, Odisha at ICAR-CIWA, Bhubaneswar	16-17 March 2020	15	Jyoti Nayak Tania Seth Geeta Saha
13.	Skill training on vacuum packaging of value added fish products at ICAR-CIWA, Bhubaneswar	27 May 2020	5	Tanuja S. J. Charles Jeeva
14.	Demonstration and Distribution of utensils and equipments and training on packaging (DSIR) at ICAR-CIWA, Bhubaneswar	1 June 2020	3	Tanuja S. J. Charles Jeeva
15.	Awareness creation programme on drudgery reduction of farm women as part of the 150th Birth Anniversary of Mahatma Gandhi at ICAR-CIWA, Bhubaneswar	30 September 2020	55	J. Charles Jeeva Ananta Sarkar S. Swain Subrat Kr. Das

S. No.	Name of the programme and project	Date	Women beneficiaries	Organisers
16.	Demonstration and Distribution of farm tools as part of the 150th Birth Anniversary of Mahatma Gandhi at ICAR-CIWA, Bhubaneswar	2 October 2020	55 SC farm families from different villages of Satyabadi block, Puri district	J. Charles Jeeva Ananta Sarkar Subrat Kr. Das
17.	Demonstration and Distribution of inputs for women involved in fish processing at ICAR-CIWA, Bhubaneswar	8 October 2020	21 fisherwomen from Kanamana Village, Astaranga Block, Puri District	Tanuja, S.
18.	Demonstration and distribution of farm tools and sprayers at ICAR-CIWA, Bhubaneswar	21 October 2020	25 farm women from Barala, Chaudapatia, Harishankarpur and Beherasahi villages of, Puri district	Jyoti Nayak Praveen Jakhar Geeta Saha
19.	Demonstration and Distribution of minor farm tools and sprayers at ICAR-CIWA, Bhubaneswar	3 November 2020	119 farm women from Resida, Balipada, Naruda, Balanga and Nuasahi villages in Puri district	J. Charles Jeeva Subrat Kr. Das
20.	Demonstration and Distribution of poultry chicks, feeder & waterer at ICAR-CIWA, Bhubaneswar	10 November 2020	10 farm women from Nuasahi village in Puri district	A.K. Panda J. Charles Jeeva Subrat Kr. Das
21.	Demonstration and Distribution of poultry chicks, coconut tree climber, coconut dehusker and hand tools like khurpi, trowel, garden hoe, trench hoe, secateurs and cultivator at ICAR-CIWA, Bhubaneswar	24 November 2020	95 farm women from Talapataka, Denua, Badala Sasan, Dihabari, Bhatabandha, Chhatahar and Hansapada villages in Nimapada block, Puri. district	A.K. Panda Chaitrali S. Mhatre Pragati Kr. Rout
22.	Demonstration and Distribution of plastic crates and rose cans at ICAR-CIWA, Bhubaneswar	18 December 2020.	20 farm women from Harishankarpur, Barala and Kadampada villages, Satyabadi block, Puri district	Tanuja, S. Jyoti Nayak Geeta Saha
23.	Training programme on Integrating gender concerns in agricultural research and extension for improving livelihood of farmwomen at ICAR-CIWA, Bhubaneswar	15-19 December 2020	32	Sabita Mishra, Anil Kumar, L. P. Sahoo, Ananta Sarkar

9.2 Exhibitions organized /participated during different occasions

Sl No	Occasion	Venue	Date	Organizers
1.	Krushi Odisha 2020	Janata Maidan, Bhubaneswar	20-24 January 2020	Jyoti Nayak Geeta Saha S.K. Behera
2.	3rd International Symposium on Genomics in Aquaculture	ICAR-CIFA, Bhubaneswar	21-23 January 2020	Tanuja, S. B.C Sahu Usharani M.
3.	Pusa Krishi Vigyan Mela 2020	ICAR-IARI, New Delhi	1-3 March 2020	J. Charles Jeeva M. Prusty P. K. Rout
4.	Farmers fair -cum-exhibition	OUAT, Bhubaneswar	7 March 2020	Ananta Sarkar B. C. Behera

9.3 Radio/ TV talks delivered by Scientists

Sl No	Title/ Theme	Radio/ TV talks	Date	Delivered by
1.	Skill Development for Farm women	AIR, Puri	17 January, 2020	Lipi Das
2.	Live Phone-in programme (Palli Mancha) on "Krushi Kshetrare Mahila- Sujoga 'O' Sambhabana".	AIR, Cuttack	31 January, 2020	Gayatri Moharana
3.	Interview was telecasted in DISHA programme of NAXATRA News on	NAXATRA News	6 February, 2020	S.K. Srivastava
4.	Year Round Income of Marginal Farm women	AIR, Puri	9 September, 2020.	Lipi Das
5.	Mahila Mananka Krushire Samshya (Issues of Women in Agriculture) phone-in live programme	Krushi Darshan DDK, Bhubaneswar	13 October, 2020	Sabita Mishra
6.	SHG Gathan O' Parichalana (SHG Formation and Management)	Krushi Darshan DDK, Bhubaneswar	14 October, 2020	Sabita Mishra
7.	Government's Programmes and Monetary Incentives for Social and Economic Development for Farm women	AIR, Puri	23 December, 2020	Lipi Das

Internship to B. F.Sc Students

Under the MoU between ICAR-CIWA and Centurion University of Technology and Management (CUTM), Paralekhmundi, Ganjam Odisha, 2 students of Bachelor of Fisheries Science (B. F. Sc.) were nominated to undergo a 10 weeks Internship programme at ICAR-CIWA from 26th October 2020 to 2nd January 2021. The students who completed internship in Fish Processing Technology were guided/mentored by Dr Tanuja S., Scientist (Fish Processing Technology).




Different activities under capacity building programmes

10. HUMAN RESOURCE DEVELOPMENT

Table 10.1 Participation of Scientific and technical staff in Seminar/ Meetings/ Workshops/ Webinars organized by ICAR-CIWA, Bhubaneswar

Sl	Name	Category	Organizers	Date
1.	Development of Technology Hub and Gender Sensitive Micro-Lab	Brainstorming Workshop	Sabita Mishra	29 February, 2020
2.	Effective policy paper writing for women in Agriculture	Webinar	S. K. Srivastava J. C. Jeeva Ananta Sarkar	27 May, 2020
3.	Management of E-office	Training	Ananta Sarkar	17 June, 2020
4.	Framework for propelling ICAR-CIWA as a Global Institute for Women in Agriculture	Brainstorming Workshop	Lipi Das B. Sahoo J. C. Jeeva Ananta Sarkar	31 July, 2020
5.	STATCRAFT (Statistical Software)	Online Demo	Ananta Sarkar	7 August, 2020
6.	Roles and Responsibilities of Vigilance Officers at Institute	Talk	Sabita Mishra	21 August, 2020
7.	Identification of New Dimensions for Preparing National/Global Level Database on Women in Agriculture	Brainstorming Workshop	Ananta Sarkar Anil Kumar J. C. Jeeva	28 August, 2020
8.	Antiplagiarism software "Check for Plagrisim by Infokart India Pvt Ltd	Online demo	Tanuja, S.	1 September, 2020
9.	Forest Rights Act and its impact on forest communities with an emphasis on agricultural rights- Dr. Kumar Jeeb Pegu, KIIT, Bhubaneswar	Talk	Tanuja, S.	16 September, 2020
10.	World Food Day (Theme: Grow, Nourish, Sustain. Together. Our Actions are our Future.)	Webinar	Ananta Sarkar	16 October, 2020
11.	Farmers Producer Organization in Livelihood enhancement of Farm women	National Webinar	Sabita Mishra Anil Kumar L. P. Sahoo Ananta Sarkar	19 November, 2020
12.	Effective Health Management for enhancing work efficiency	HRD webinar	J. C. Jeeva Tanuja, S. Ananta Sarkar	20 November, 2020
13.	KYC- Know your Constitution: Rights and Duties- Advocate Archna Mishra, SDC, Bhubaneswar	Talk	Tanuja, S.	26 November 2020
14.	Vigilance Awareness Week-2020 lecture by Mr I. B. Kumar, SAO, ICAR-CIFA	Talk	Sabita Mishra	29 November, 2020
15.	Evolving Livelihoods for Women in Post-Harvest Fisheries: Approaches, Policies and Institutional Support	National Webinar	Tanuja Charles Jeeva	14 December, 2020
16.	Effective health management during Covid-19 through clean and green environment- Dr. G. Kar, Director, ICAR-CRIJAF, Kolkata	Talk	Lipi Das Tanuja, S	18 December, 2020
17.	Agriculture Technologies for Convergence of waste to wealth and safe disposal of all kinds of waste- Dr. A.K. Rajput, Director, RC of Organic farming, Bhubaneswar	Talk	A. K. Panda B. Sahoo Tania Seth C. S. Mhatre	22 December, 2020
18.	Importance of cleanliness and sanitation in human life- Sh. K.M. Behera, Health Deptt., Govt. of Odisha	Talk	Sabita Mishra L.P. Sahoo Neetish Kumar	24 December, 2020
19.	Importance of cleanliness drive in Institutes – Sh. Ananat Narayan Jena, Ex-Mayor, BMC, Bhubaneswar	Talk	B. Sahoo P. Jakhar	30 December, 2020

Table 10.2 Participation of Scientific and technical staff in Seminar/ Meetings/ Workshops/ Webinars organized in other institutes

Sl	Name	Category	Organizers	Participants	Date
1.	Scientific Advisory Committee Meeting	Meeting	KVK, Gajapati	S.K. Srivastava	17 January, 2020
2.	Enhancing Role of Women SHG for Agricultural Profitability	Seminar	Krushi Odisha 2020, Bhubaneswar	Lipi Das J. Charles Jeeva	24 January, 2020
3.	Recent advances in ornamental fish farming	Trainers training	ICAR-CIFA, Bhubaneswar	Tanuja, S	27-31 January, 2020
4.	E-office in ICAR institutes	Online training	ICAR-IASRI, New Delhi	Ananta Sarkar Shaji, A. J. R. Biswal B. Moharana P. Mallick J. R. Das T. Mangaraj	1 May, 2020
5.	Women in Agriculture Sector: Consultation on Facilitating a Better Role	Webinar	National Commission for Women, New Delhi	S.K. Srivastava	8 May, 2020
6.	Training Management Information System	Online Workshop	HRM Unit, ICAR, New Delhi	J. Charles Jeeva	8 May, 2020
7.	Approaches of Public Funded Research Organizations in Agri-Technology Generation and its Transfer in New Normal Situation	NAARM-TBI	ICAR-NAARM, Hyderabad	J. Charles Jeeva Jyoti Nayak	28 May, 2020
8.	ICAR-KRISHI Geoportal Spatial Data Infrastructure and Applications -A Way forward	Meeting	ICAR-NBSS&LUP, Nagpur	Ananta Sarkar	2 June, 2020
9.	Business Opportunities in Fish Post-Harvest	National Webinar	Online ICAR-CIPHET, Ludhiana	Tanuja, S	5 June, 2020
10.	Modern Agricultural Technology: A Step towards Rural Self-Reliance	National Webinar	Institute of Agriculture, Visva-Bharati, West Bengal	Pragati K Rout	12-14 June, 2020
11.	Novel approaches in agro-ecology, forestry, horticulture, aquaculture, animal biology and food sciences for sustainable community development	International Conference	Krishi Sanskriti, New Delhi	Tanuja S Chaitrali Mhatre	14 June 2020
12.	Food and nutritional security in climate change era: Challenges and solutions	National Webinar	Jannayak Chandrasekhar University, Balia	Anil Kumar	22 June, 2020
13.	New Trends in Agriculture, Environmental & Biological Sciences for Inclusive Development	International Web-Conference	NTAEBSID-2020	Tanuja S. Gayatri Moharana C. S. Mahatre	21-22 June, 2020
14.	Ergonomical Design Guidelines for Agricultural Tools, Equipment and Work Place	National Webinar	ICAR-CIAE,Bhopal	Jyoti Nayak Pragati K. Rout	29 June - 3 July, 2020
15.	Awareness & Use of CeRA Resources through J-Gate Discovery Platform	National Webinar	Nehru Library, CCS HAU, Hisar	Ananta Sarkar Tanuja	25 June, 2020
16.	MDP on implementation of ABS regulations in agricultural research	Training	NAARM	Praveen Jakhar	10 July, 2020

Sl	Name	Category	Organizers	Participants	Date
17.	Goat farming for sustainable livelihood security and improving farmers income	Webinar	CIRG, Makhdoom	B.Sahoo	10 July, 2020
18.	Framework of Treasury Single Account System for Autonomous Bodies through PFMS	Training	CGA, New Delhi	S.K. Srivastava Shaji, A. Janardan Biswal	17 July, 2020
19.	198th birth anniversary of Groger J. Mendel "Climate Smart Agriculture"	International Webinar	CAAST-CSAWM (NAHEP), MPKV, Rahuri	D. Sarangi	22 July, 2020
20.	Precision Farming in Banana	Training	ICAR-NRCB, Trichy	M. Prusty Pragati K. Rout	25 July, 2020
21.	Role of Agri-Inputs in Realizing Genetic and Agronomic Potential of Crops for Sustainable Agriculture	National webinar	Ray talks, Non-profit platform	Praveen Jakhar	25 July, 2020
22.	Disease Management in Banana	Training	ICAR-NRCB, Trichy	M. Prusty	29 July, 2020
23.	Prospects and challenges in Poultry Sector: Small scale farming to Large Commercial Enterprises	National Webinar	College of Vety. Sci. & AH, NDVSU, Jabalpur	A.K.Panda	26-27 July 2020
24.	Mycotoxin and Gut health in chicken	Webinar	Ayurvet, India	A.K.Panda	28 July 2020
25.	Role of Women in Environmental Sustainability''	Expert Consultation Webinar	NIOH, Ahmadabad	Jyoti Nayak	28 July, 2020
26.	Atmanirbhar Indian Poultry in New Normal	National Webinar	DUVASU, Mathura	A.K.Panda	09-11 August, 2020
27.	Under-utilized crops for augmenting farmers income in abiotic stress regions	National webinar	ICAR-NIASM, Baramati	Praveen Jakhar Tania Seth	10 August, 2020
28.	Gender and Pandemic-Challenges and Opportunities''	Digital Discourse Series 2020	ATARI, Bengaluru	Lipi Das Jyoti Nayak J. Charles Jeeva	11 August, 2020
29.	NARES-Cloud Infrastructure and Services" along with "Accreditation Portal" and "Alumni Network Portal"	Launching of "Krishi Megh"	ICAR-IASRI, New Delhi	Ananta Sarkar	11 August, 2020
30.	ABC of Scientific writing	Training programme	ICAR-NRRI, Cuttack	B.Sahoo	18 Aug. – 2 September, 2020
31.	OMICS in crop improvement	International webinar	Anamalai University	D. Sadangi	21 August, 2020
32.	Mushroom production: an emerging avenue for rural youth and self-employment	National Web Conference	Bihar Agricultural University, Sabour	Tania Seth	26 - 27 August, 2020
33.	Abiotic Stress in Agriculture: Geospatial Characterization and Management Options"	National webinar	ICAR-NIASM, Baramati	Anil Kumar	27 August, 2020
34.	Boosting immunity through horticulture	National Webinar	Society for Horti. Res.& Development	Tania Seth	1-9 September, 2020
35.	Gut Health and rational use of anticoccidials in poultry feed	National Webinar	Vetinal Healthcare LLP, India	A.K.Panda	12 September, 2020
36.	Market Dynamics in Poultry Sector: Perspectives and Challenges	National Webinar	Anand Agriculture University, ANAND	A.K.Panda	17-18 September, 2020

Sl	Name	Category	Organizers	Participants	Date
37.	Intellectual Property Rights in Agricultural Research & Education in India	Workshop-cum-training	NAHEP & IP& TM of ICAR, New Delhi	Lipi Das B.Sahoo	12 - 28 September, 2020
38.	Industry-Academia	Interface Meet	ICAR-IVRI-Kolkata	B.Sahoo	15 September, 2020
39.	Future of Strategic Technological Innovation and Entrepreneurship Development in Agriculture and Allied Sector for Food and Livelihood Security	National e-conference	SOA University, Bhubaneswar	B.Sahoo	14- 16 September, 2020
40.	Augmenting vegetable productivity through recent techniques	National Web Conference	Bihar Agricultural University, Sabour, Bhagalpur	Tania Seth	9-10 September, 2020
41.	Food security and the stand of civilization : agri-horti-livestock dynamics in changing global ecology"	International Symposium	BCKV, India and Lincoln University College, Malaysia & University of Bengkulu, Indonesia	S. Swain Tania Seth	20-21 September, 2020
42.	Layer Poultry Production and Management	National Webinar	CPDO Mumbai	A. K. Panda	10 -12 October, 2020
43.	Gender Issues and Atmanirbhar Bharat in Agriculture'	National Workshop	CAU, Imphal, Manipur	Sabita Mishra	15 October, 2020
44.	Harnessing the potential of tropical tuber crops under changing climate	International Webinar	ICAR-Central Tuber Crops Research Institute, Kerala	S. Sawin Tania Seth	27 October, 2020
45.	Entrepreneurial opportunities in rural poultry sector	Webinar	ICAR-DPR Hyderabad	A. K.Panda	3- 5 November, 2020
46.	Market Research and Value chain management of Agricultural commodities	Webinar	NAARM, Hyderabad	B.Sahoo	17-21 November, 2020
47.	Analysis of Experimental Data Using SAS	Training	NAARM, Hyderabad	Ananta Sarkar S. Swain	9-14 November, 2020
48.	1st Indian Rice Congress - 2020 Rice Research and Development for Achieving Sustainable Development Goals	Congress	NRRI Cuttack	Praveen Jakhar	8-9, December, 2020
49.	Big Data Analytics in Agriculture	National Seminar	ICAR-NAARM, Hyderabad	Anil Kumar Ananta Sarkar	10-11 December 2020
50.	Prospective Priorities and Preparedness of Sustainable Agriculture Development in India	Online National Seminar	Dr. Ram Avatar Shiksha Samiti Ghunghchai, Uttar Pradesh	S. Swain	28-29 December, 2020

11. DISTINGUISHED VISITORS

S.No	Name & Designation	Date
1.	Sh. Sulochana Das, State Commissioner, Govt. of Odisha	02-01-2020
2.	Dr. Pawan Kumar Agarwal, Vice Chancellor, OUAT, Bhubaneswar	14-01-2020
3.	Dr. N. S. Rathore, Vice Chancellor, MPUAT, Udaipur, Rajasthan	22-01-2020
4.	Prof. (Dr.) Yogesh Pratap Singh, Registrar, NLU, Odisha	20-02-2020

12. DIRECTOR'S VISITS

Place	PURPOSE	Date
ICAR, Agricultural Education Division, New Delhi	Meeting with ADG (EP& HS)	08.01.2020
Krushi Odisha-2020, Bhubaneswar	Review meeting	09.01.2020
Hotel Taj Lands End, Mumbai	Agriculture Innovation Congress to receive "BEST INSTITUTE IN AGRICULTURE" Award	12.02.2020
ICAR-IIWM, Bhubaneswar	Sri S.K.Singh , Addl. Secretary (DARE), ICAR, New Delhi	20.02.2020
ICAR-NRRI Cuttack	National Workshop on " Rice Research and Development for Doubling Farmers Income"	28.02.2020
OUAT, Bhubaneswar	Board of Management Meeting and Review the performance of Dean Research	29.02.2020
OUAT, Bhubaneswar	Board of Management Meeting	27.08.2020

13. RESEARCH PROJECTS

S. No	Title	Duration	Team	PME code
1.	Designing and development of a gender sensitive agri-nutri (GSAN) farming system model	2019-22	Dr. Lipi Das Dr. S. K. Srivastava Dr. Biswanath Sahoo Dr. Praveen Jakhar Dr. Sachidananda Swain Dr. Tania Seth	AGEDCIWASIL201900200094
2.	Studies on sectoral contribution of women in agriculture and allied sectors	2020-23	Dr. Anil Kumar Dr. Ananta Sarkar Dr. Tanuja S Mr. Neetish Kumar	AGEDCIWASIL202000100095
3.	Development of integrated national information system for women in agriculture	2020-23	Dr. Ananta Sarkar Mr. Neetish Kumar	AGEDCIWASIL202000200096
4.	Integrating gender dimensions for improvement of livelihood through empowerment	2020-23	Dr. Sabita Mishra Dr. Anil Kumar	AGEDCIWASIL202000300097
5.	Development of women entrepreneurship in livestock and fisheries sector for promoting gender equity and strengthening livelihood	2020-23	Dr. Tanuja S Dr. Arun kumar Panda Dr. Lipi Das Dr. Biswanath Sahoo	AGEDCIWASIL202000400098
6.	Entrepreneurship development through value addition and product diversification of food crops	2020-23	Dr.Sachidananda Swain Dr. Lipi Das Dr. Jyoti Nayak Dr. Tania Seth	AGEDCIWASIL202000500099
7.	Study of farm equipments and tools for drudgery reduction of women in agriculture	2020-23	Er. Chaitrali S Mhatre Dr. Jyoti Nayak	AGEDCIWASIL202000600100
8.	Design and development of gender sensitive integrated vertical nutri-farming system (IVNFS) for household nutrition and income	2020-23	Dr. Tania Seth Dr. Arun kumar Panda Er. Chaitrali S Mhatre	AGEDCIWASIL202000700101
9.	Increasing productivity of rice-based cropping systems and farmers' income in Odisha	2017-21	Dr. A. K. Panda, Dr. Sabita Mishra, Dr. Jyoti Nayak Dr. J.Charles Jeeva, Dr. Ananta Sarkar	Externally funded (IRRI-CIWA Collaborative Project)
10.	Adding value to fish: a potential livelihood option for rural women of Odisha	2018-21	Dr. Tanuja S. Dr. J. Charles Jeeva	Externally funded (DSIR Project)
11.	Women empowerment and gender sensitization-developing a model for bridging gender gap	2019-22	Dr. Lipi Das Ms. Gayatri Moharana Mrs. Ankita Sahu Dr. Praveen Jakhar	Externally funded (NASF Project)
12.	AICRP on Ergonomics and Safety in Agriculture	2020-23	Er. Chaitrali S. Mhatre Dr. Jyoti Nayak	Externally funded (AICRP-ESA)
13.	AICRP on Home Science	2020-23	Dr. S. K. Srivastava Dr. Lipi Das	(AICRP-HS)

14. PERSONNEL

14.1 Details of Staff (As on 31-12-2020)

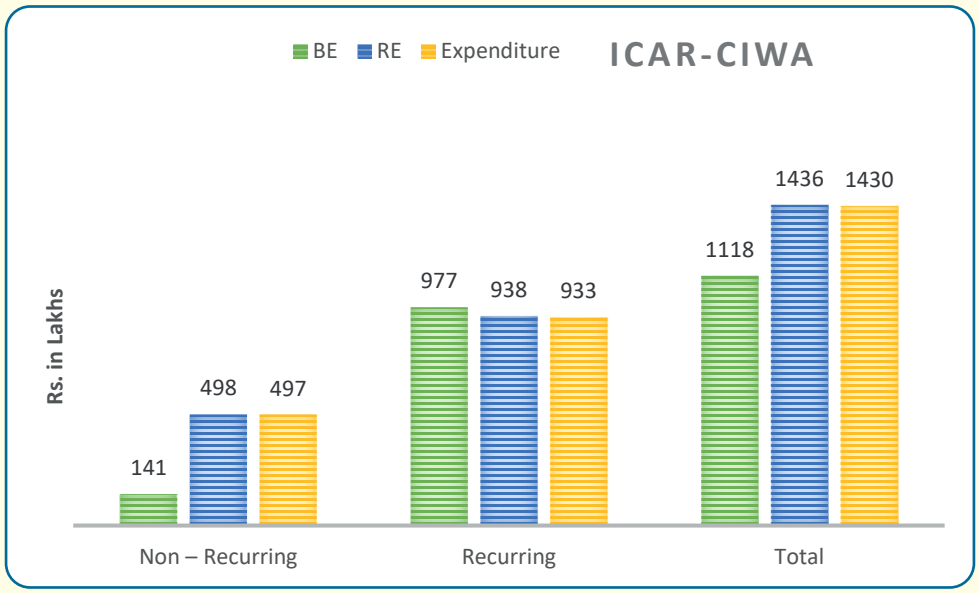
S. No	Name	Designation
1	Dr. S. K. Srivastava	Principal Scientist & Director (Acting)
2	Dr. Anil Kumar	Principal Scientist
3	Dr. Sabita Mishra	Principal Scientist
4	Dr. Arun Kumar Panda	Principal Scientist
5	Dr. Lipi Das	Principal Scientist
6	Dr. Biswanath Sahoo	Principal Scientist
7	Dr. Jyoti Nayak	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 (on study leave)
18	Sh. Neetish Kumar	Scientist
19	Sh. Shaji A.	Assistant Chief Technical Officer
20	Mrs. Geeta Saha	Technical Officer
21	Sh. Debendra Nath Sarangi	Technical Officer
22	Sh. Manoranjan Prusty	Technical Officer
23	Sh. Bhikari Charan Behera	Technical Officer
24	Sh. Bishnu Charan Sahu	Technical Officer
25	Mrs. Tapaswini Sahoo	Senior Technical Assistant (on study leave)
26	Sh. Sanjay Kumar Behera	Senior Technical Assistant
27	Er. Pragati Kishore Rout	Senior Technical Assistant
28	Er. Subrat Kumar Das	Senior Technical Assistant
29	Sh. Atul Chetan Hemrom	Senior Technical Assistant
30	Mrs. Usharani Maradana	Technical Assistant
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

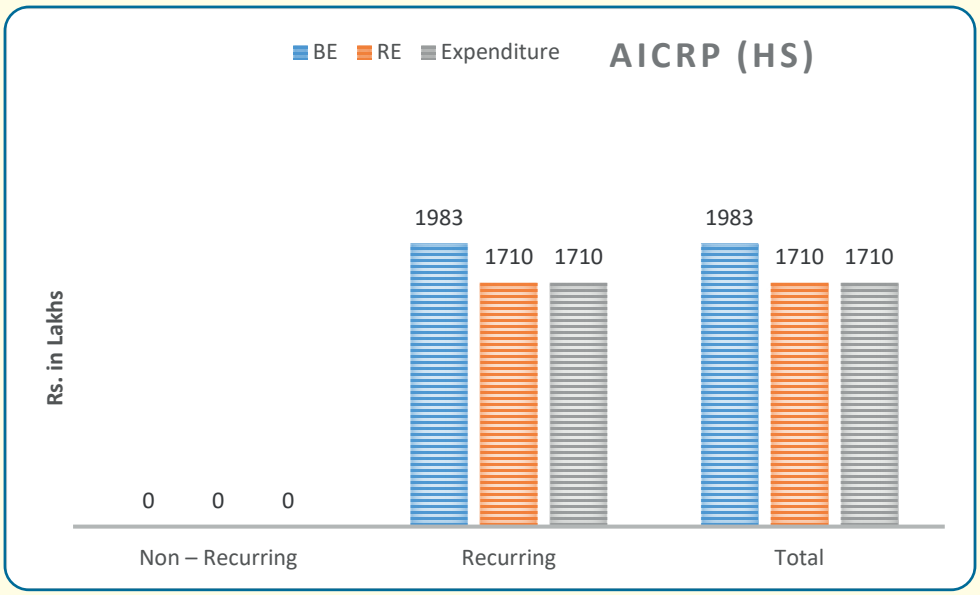
14.2 Appointments/Joining /Superannuation

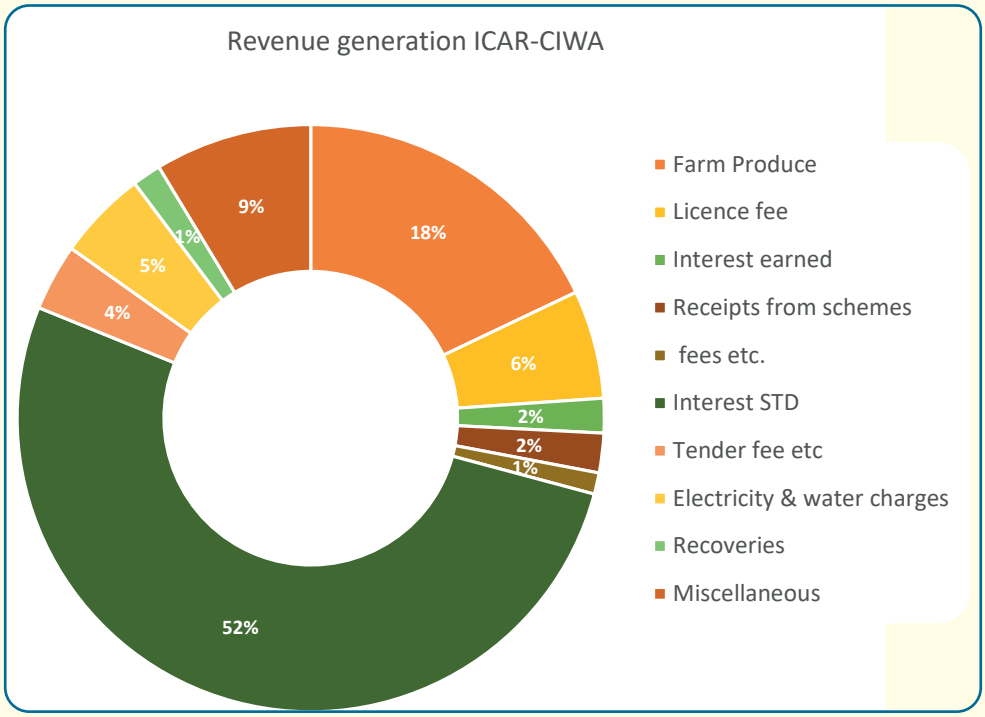
Sl. No	Name	Designation	Date	Details
1.	Sh. Neetish Kumar	Scientist	04-04-2020	Joined on appointment
2.	Sh. Jairam biswal	AO	31-08-2020	Retirement

14.3 Promotions

Sl. No	Name	Promoted to the Post
1.	Sh. Parikshit Mallik	Personal Assistant


BE
RE
Expenditure
ICAR-CIWA
Rs. in Lakhs
141
498
497
977
938
933
1118
1436
1430
Non – Recurring
Recurring
Total


BE
RE
Expenditure
AICRP (HS)
Rs. in Lakhs
0
0
0
1983
1710
1710
1983
1710
1710
Non – Recurring
Recurring
Total


Revenue generation ICAR-CIWA
18%
6%
2%
2%
1%
52%
4%
5%
1%
9%
Farm Produce
Licence fee
Interest earned
Receipts from schemes
fees etc.
Interest STD
Tender fee etc
Electricity & water charges
Recoveries
Miscellaneous

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(भारतीय कृषि अनुसंधान परिषद)
भुवनेश्वर - 751 003, ओडिशा, भारत

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