

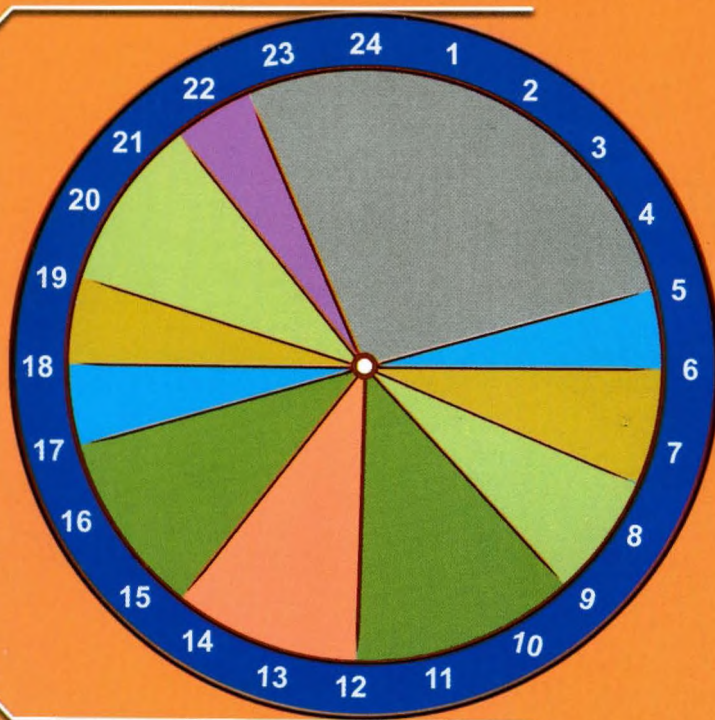
ANNUAL REPORT

2009-10

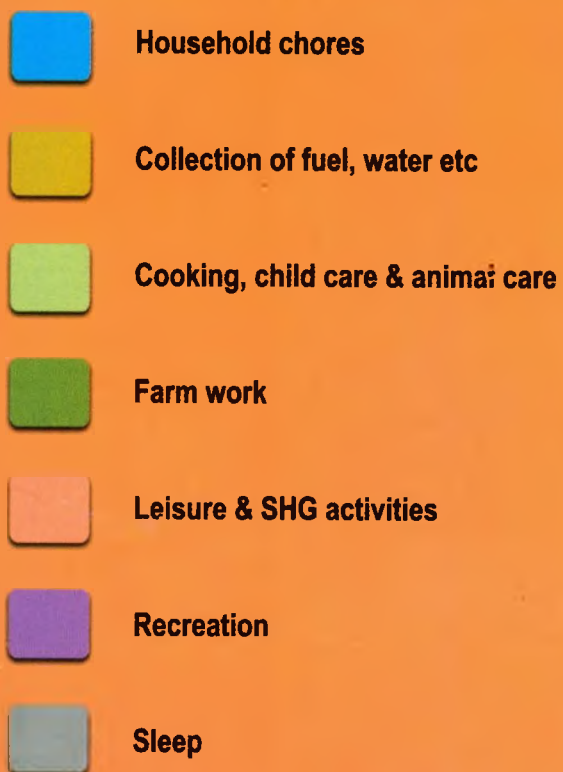


Directorate of Research on Women in Agriculture
(Indian Council of Agricultural Research)

Bhubaneswar - 751 003



Activity clock of farmwomen



DRWA

Annual Report 2009-10



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Published by
Dr Krishna Srinath
Director, DRWA

Editorial Board
Dr Krishna Srinath
Dr M. Srinath
Dr M.P.S Arya
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Preface

ICAR has pioneered the institutionalization of gender research in agriculture through establishment of Directorate of Research on Women in Agriculture in 1996. During 2009-10, identification of gender issues and refinement of technologies in gender perspective have been the main focus of the research programmes of the Directorate. In addition to 16 in house projects under different disciplines, six network projects were implemented in different sectors of agriculture with the participation of 26 ICAR Institutes/ Agricultural Universities, AICRP on Home Science with nine coordinating Centres and four inter institutional projects with eight centres covering more than 100 locations in the country that enabled the collection of sizable gender disaggregated data in agriculture. The women friendly technologies including hand operated maize dehusker-cum-sheller and head-load manager developed under research projects are expected to be useful in reducing the drudgery of farmwomen. Involvement of multidisciplinary team of scientists and the action research method followed in the research projects have helped in examining the sector-wise problems in gender



mainstreaming and provided valuable knowledge and insights towards addressing these problems.

I am grateful to Dr Mangala Rai, the Former Secretary (DARE) & Director General, ICAR and Dr S. Ayyappan, Secretary (DARE) & Director General, ICAR for their unflinching support in implementing the programmes of the Directorate. I am thankful to Dr Kiran D. Kokate, Deputy Director General, Agricultural Extension, ICAR for his guidance in carrying out the activities of the Directorate.

I appreciate the members of the Editorial Board for their effort in timely publication of the Annual Report.


 Krishna Srinath
 Director
 Directorate of Research on Women in Agriculture
 Bhubaneswar

22 July, 2010

Directorate of Research on Women in Agriculture
 Bhubaneswar

सारांश

निदेशालय के अधिदेश के अनुसार लिंग सम्बन्धी परियोजनाएं व कार्यक्रम जैसे उपलब्ध कृषि उन्नत उपकरणों का लिंग परिपेक्ष्य में उपयोगिता का मूल्यांकन किया गया। सोलह संस्थागत परियोजनाओं के अतिरिक्त, छः नेटवर्क परियोजनाएं एवं गृह-विज्ञान पर अखिल भारतीय समन्वित अनुसंधान परियोजना इत्यादि में भारतीय कृषि अनुसंधान परिषद के 36 विभिन्न संस्थानों व कृषि विश्वविद्यालयों से देश के 100 से अधिक विभिन्न स्थानों पर कार्यक्रम व गतिविधियाँ शुरू की गई। राष्ट्रीय कृषि नवोन्मेषी परियोजना व क्षमता बढ़ाने के कार्यक्रमों के द्वारा लिंग को मुख्यधारा में लाने के प्रयास भी किये गये।

लिंग सूचना प्रणाली के संवर्धन हेतु 2500 संदर्भों का विभिन्न पत्रिकाओं, वार्षिक प्रतिवेदनों व किताबों से संकलन किया गया है जो कि अनुसंधान कार्यकर्ताओं व छात्रों के लिए उपयोगी होगा। उड़ीसा कृषि व तकनीकी विश्वविद्यालय में छात्रों द्वारा बी.एस. सी. (कृषि), बी.वी.एस.सी. वी.एफ.एस.सी. व बी.एस.सी. (वानिकी) में प्रवेश लेने के 15 वर्षों के आंकड़ों के आधार पर लिंग सम्बन्धी अध्ययन से ज्ञात हुआ कि लड़कियों की प्रवेश प्रतिशत वर्ष 1994 में 22 प्रतिशत थी जो कि वर्ष 2009 में बढ़कर 50 प्रतिशत हो गयी। इससे प्रतीत होता है कि कृषि विषयों में छात्रों के प्रवेश में लिंग अनुपात में समानता के संकेत हैं व सभी विषयों में लड़कियों के प्रवेश लेने में बढ़ोत्तरी के संकेत हैं। नेटवर्क परियोजना में कृषि के विभिन्न क्षेत्रों व अनुभागों से सम्बन्धित लिंग विभेदी आँकड़े इकट्ठे किये गये हैं।

फल-सब्जी की फसलों की पसन्द का विश्लेषण करने से ज्ञात हुआ कि सिंचाई की सुविधा हो या न हो, दोनों ही प्रकार के ग्रामों की शत-प्रतिशत महिलाओं ने फल, सब्जी व फूलों की फसलों को अपने घर के प्रयोग के लिए, पूजा व ईंधन के लिए उगाया। जबकि पुरुषों ने इन फसलों को व्यवसाय के लिए उगाया। फल-फूल व सब्जियों की फसलों में महिलाओं की भूमिका के बारे में प्राप्त आँकड़ों से ज्ञात हुआ कि महिलाओं की सबसे अधिक भूमिका इन फसलों की नर्सरी लगाना, फसल के लिए जमीन तैयार करना जैसे पत्थर-ढेले निकालना, जमीन एकसार करना, खाद लगाना व जमीन की सफाई करना इत्यादि में है। फल-फूल फसल आधारित विभिन्न मॉडल जो कि एक कृषक परिवार के खाने (Food), ईंधन (Fuel), चारा (Feed and Fodder), रेशा (Fibre) और आमदनी (Finance) (छह एफ) इत्यादि की आवश्यकता की पूर्ति करते हैं को आम, अमरूद, नारियल, काजू, सूक्ष्म फल व होर्टी-सिल्वी पाश्चर आधारित मॉडलों को निदेशालय के खेतों (फार्म) में लगाया गया। इनमें करीब 25 बीच

में लगाने वाली फसलों जैसे सब्जियों की फसलें, कम समय में उगने वाले फलों की फसलें, फूलों की फसलें, महक वाले पौधों की फसलें, चारा व कन्द-फसलों को लगाया गया।

सब्जियों के उगाने में महिलाओं की भागीदारी 80 प्रतिशत पायी गई तथा देखा गया कि घर के पिछवाड़े में सब्जियों की फसलों को उगाने में महिलाएं अधिकतर अरासायनिक उर्वरकों व पीड़कनाशीयों का प्रयोग करती हैं। अतः इस लिंग परिपेक्ष्य में कार्बनिक पीड़कनाशीयों को अधिक सुधारने के प्रयास किये गये। फिरामोन ट्रैप व सिंचाई के पानी में नीम की खली का प्रयोग, दीमक को कम करने के लिए मिट्टी के बर्तन का ट्रैप-भुट्टा सहित, हींग के पानी में टमाटर की पौध को डुबाना, व पौध लगाने से पहले हल्दी पाउडर का प्रयोग व गेंदा की फसल का ट्रैप के रूप में प्रयोग इत्यादि को महिलाओं ने पसन्द किया। महिलाओं द्वारा प्रयोग की गई विभिन्न परम्परागत पीड़कनाशी विधियों का संकलन किया गया है।

मध्य प्रदेश की महिलाओं की शारिरिक संरचना के आंकड़ों के आधार पर मक्का के भुट्टों से पतवार अलग कर उसके दानों को अलग करने का एक यन्त्र विकसित किया गया है। जो कि महिलाओं के द्वारा खड़े व बैठ कर दोनों प्रकार से प्रयोग किया जा सकता है। इसके प्रयोग से महिलाओं में 40 प्रतिशत से 24 प्रतिशत शारिरिक उर्जा कम खर्च होती है अपेक्षाकृत हाथ से पतवार हटाना व हाथ वाले यन्त्र से उसके दाने निकालती है।

लिंग संवेदी प्रसार मॉडल विकसित करते हुए पाया गया कि ग्राम स्तर पर सहप्रसार कार्यकर्ताओं को अपनी अच्छी भूमिका निभाने में उनकी सामाजिक सक्रीयता, कृषि का अच्छा ज्ञान व शिक्षा को अधिक उपयुक्त पाया गया।

उड़ीसा राज्य की जन-जातियों की जीविका के तौर-तरीकों का विश्लेषण करने से ज्ञात हुआ कि जिन परिवारों की जीविका जंगल में पाये जाने संसाधनों पर निर्भर थी उन परिवारों में कुपोषित बच्चों की संख्या अधिक थी अपेक्षाकृत उन परिवारों के जहाँ जीविका का साधन व्यवसाय या नौकरी था। इन परिवारों के बच्चों का पोषण स्तर अपेक्षाकृत अच्छा था। निदेशालय के द्वारा स्थानीय स्तर पर उपलब्ध विटामिन ए अधिकता वाली शकरकन्दी (गौरी किस्म) से शिशुओं के लिए एक कम मूल्य का ऊपरी-आहार तैयार किया गया है। इस शिशु ऊपरी आहार को 6-18 महीने की आयु के शिशुओं को खिला कर मूल्यांकन किया गया तो ज्ञात हुआ कि यह आहार 6-12 महीने के शिशुओं की शारीरिक वृद्धि के लिए उपयोगी है।

जयपुर, महिसा, सिमोर व कान्टामलिम ग्रामों में जब महिलाओं के साथ खासतौर पर परम्परागत ज्ञान, संसाधनों की उपलब्धता व पशुपालन में उनकी भूमिका के बारे में चर्चा की गई तो ज्ञात हुआ कि पशु पालन व उनके प्रबन्धन से सम्बन्धित अधिकतर कार्यों की जिम्मेदारी महिलाओं, बच्चों व वृद्ध व्यक्तियों की होती है। पशुओं के प्रबन्धन में महिलाओं का 70 प्रतिशत से अधिक श्रम, पशुपालन सम्बन्धित विभिन्न कार्यों में लगता है। पुरी जिले के महिसा ग्राम में किये गये एक अध्ययन से ज्ञात हुआ कि पिछड़ी व अनुसूचित जाति की अधिकतर महिलाएं घर के पिछवाड़े में मुर्गी पालन करती हैं इससे उन्हें अच्छी आमदनी होती है क्योंकि मुर्गियों के दाने व दवाई में खर्चा बहुत कम होता है। करीब पाँच महीने बाद 6-8 मुर्गियों की एक इकाई से करीब रु. 2000 की आमदनी हो जाती है।

झरनापानी के पफूटसिरोमी ग्राम में कृषक परिवार पशुओं में मिथुन को पसन्द करते हैं। क्योंकि यह वहाँ की जलवायु के लिए उपयुक्त है। तथा इससे माँस अधिक मात्रा में मिलने से अच्छी आमदनी होती है।

उड़ीसा राज्य में जनजाति महिलाओं की कृषि व जंगल के लकड़ी के अलावा अन्य उत्पादित वस्तुओं के बेचने में भूमिका के बारे में किये गये एक अध्ययन से ज्ञात हुआ कि यह जनजाति महिलाएं जंगल में पायी व उगाने वाली सभी वस्तुओं को बाजार में बेचने का कार्य करती हैं। जैसे अनाज, दालें, सब्जियाँ, फल, मसाले, मूल्य-वर्धित उत्पाद, माँसाहारी व अन्य स्थानीय वस्तुयें शराब (हान्डियाँ), नमक, हाथ से बनी कलात्मक वस्तुएँ इत्यादि। यह महिलाएं जंगल आधारित उत्पाद जैसे शहद, हल्दी, मशरूम, हरी पत्तियाँ, कटहल, कटहल के बीज, आम इत्यादि को इकट्ठा कर इन्हें बेचती हैं। परन्तु बिचोलिए व बाजार की दूरी की वजह से इन्हें इन उत्पादों को बेचने में कठिनाई होती है।

कृषिरत महिलाओं को कृषि व इससे सम्बन्धित क्षेत्रों में उनकी आवश्यकताओं के आधार पर उनकी सूचना व जानकारी के लिए प्राथमिक क्षेत्रों का पता लगाया गया जिससे उनकी आवश्यकता के अनुसार आई.सी.टी. माड्यूल को विकसित किया जा सके। इनसे उनको कृषि विकास व तकनीक के क्षेत्र में होने वाले विकास के बारे में जानकारी प्राप्त हो सके।

गृह विज्ञान पर अखिल भारतीय समन्वित परियोजना के तकनीकी कार्यक्रम में मुख्यतया कृषि में लिंग सम्बन्धी आकड़ों को इकट्ठा करना व महिलाओं के लिए प्रशिक्षण माड्यूल विकसित करना, कृषिरत महिलाओं की उदासीनता व श्रम को हल्का

करने हेतु तकनीकी उपकरणों व यन्त्रों का मूल्यांकन कर आवश्यकतानुसार फेर-बदल करना, पोषण सुरक्षा व स्वास्थ्य को बढ़ावा देना, किशोर लड़कियों में व्यवसायिक कौशलों को विकसित करना, कम प्रयोग किये जाने वाले प्राकृतिक संसाधनों से पाये जाने वाले रेशों में मूल्य संवर्धन करना, व जिविका सुरक्षा हेतु महिलाओं का सशक्तिकरण करना इत्यादि है। इस परियोजना से उपलब्ध जानकारी व तकनीकी ज्ञान को जनमानस तक पहुँचाने के लिए 'कृषि विकास केन्द्रों' के वैज्ञानिकों के साथ अन्तर्विनिमय गोष्ठियाँ आयोजित की गई। गोष्ठियों में महिलाओं की आय बढ़ाने हेतु प्राकृतिक रेशों के संसाधनों में मूल्य संवर्धन करना, कृषिरत महिलाओं की क्षमता बढ़ाने व उदासीनता कम करने हेतु तकनीकी ज्ञान देने के लिए प्रशिक्षण माड्यूल की जानकारी, उन्नत कृषि यन्त्रों व अन्य उपकरणों का महिलाओं द्वारा खेतों व घर में प्रयोग, पोषण सुरक्षा के लिए विभिन्न खाद्य पदार्थों में मूल्य संवर्धन करना जीवनोपयोगी कौशलों में किशोरियों का सशक्तिकरण व ग्रामीण किशोरियों की प्रशिक्षण आवश्यकता का पी.आर.ए. विधि से पता लगाना, जिससे प्रशिक्षण माड्यूलों को विकसित किया जा सके इत्यादि विषयों पर चर्चा की गई।

विभिन्न विषयों से सम्बन्धित प्रशिक्षक प्रशिक्षण कार्यक्रमों का आयोजन किया गया जैसे लिंग विश्लेषण करना, लिंग संवेदनशीलता के तरीके, समुद्र तटीय मछुहारिन महिलाओं के कौशल को विकसित करना व कृषिरत महिलाओं का सशक्तिकरण इत्यादि। प्रशिक्षण कार्यक्रमों में करीब 500 कृषिरत महिलाओं ने भाग लिया। 4 दिसम्बर 2009 को कृषिमहिला दिवस के उपलक्ष्य में एक राष्ट्रीय सेमिनार 'कृषि में महिलाएं' का आयोजन किया गया।

राजभाषा हिन्दी चेतना मास में विभिन्न सांस्कृतिक व जागरूकता कार्यक्रमों का आयोजन किया गया। निदेशालय के वैज्ञानिकों ने विभिन्न कार्यशालाओं, सेमिनार व कान्फ्रेंसों में भाग लिया। निदेशालय के वैज्ञानिकों की क्षमता व कौशल विकसित करने हेतु उन्हें विभिन्न अन्तराष्ट्रीय व राष्ट्रीय प्रशिक्षण कार्यक्रमों व कार्यशालाओं में नामित किया गया। □

EXECUTIVE SUMMARY

In pursuance of the Mandate of the Directorate, activities were under taken to test the appropriateness of available farm technologies, programmes and policies in gender perspective. In addition to 16 in-house projects under different disciplines, six network projects and AICRP on Home Science were implemented with the participation of 36 ICAR Institutes/ Agricultural Universities covering about 100 locations in the country. Efforts were also made to address gender mainstreaming through NAIP and capacity building programmes.

The gender information system in agriculture was enriched with 2500 references collected from journals annual reports, text books, proceedings etc which will be useful to students and researchers. A study based on 15-years' gender disaggregated longitudinal data on students' enrolment into courses such as B.Sc (Ag), B.V.Sc., B.F.Sc. and B.Sc. (Forestry) in Orissa University of Agriculture and Technology (OUAT), Bhubaneswar revealed that enrolment of girls which was 22 per cent in 1994 increased to almost 50 per cent in 2009, indicating gender equality in students' enrolment into agricultural courses and upward trend in girl's enrolment in all the courses during the period. Surveys were undertaken in network projects to collect gender disaggregated data on different sectors of agriculture.

Analysis of preferences for cultivation of horticultural crops revealed that women of both irrigated and rainfed villages cultivated fruits crops for home consumption, worship and fire wood whereas men produced these crops for commercial purpose. Data on role of women in horticulture revealed that participation was highest in nursery and land preparation such as stubble collection, land leveling, manure application and cleaning of field. Horticulture based cropping models capable of fulfilling the need for food, feed, fuel, fodder, fibre and finance (six 'F') needs of a farm family were laid out at DRWA, integrating about 25 intercrops including vegetables, short duration fruit crops, flowers, aromatic plants, fodder crops and root crops.

Women's participation in vegetable production accounted for 80 per cent and they were mostly found using non-chemical fertilizers and pesticides in their backyard production system. Taking advantage of this situation efforts were made to refine organic pesticide practices for vegetables in a gender perspective. Use of

pheromone traps, application of neem cake through irrigation water, earthen pot trap with maize cobe for termite control, soaking of tomato seedlings in asafoetida solution incorporating turmeric powder before transplanting and planting of marigold as trap crop were preferred by farmwomen. Various ITKs related to pesticide use as reported by farmwomen were documented.

A maize dehusker-cum-sheller was developed based on the anthropometric data of farmwomen of Madhya Pradesh that could be operated in standing and sitting postures and was found to reduce physiological cost by about 40 per cent and 24 per cent respectively compared to dehusking and shelling with hand or with tabular maize sheller.

While developing a gender sensitive extension model it was found that Village level Para Extension Workers having good social participation skills, knowledge of farming and formal education were found to be more suitable to perform the role.

An analysis of livelihood patterns among tribal families of Orissa revealed that malnutrition was higher among children belonging to forest based livelihood pattern. Nutritional status was found better among children of business and services based livelihoods. Low cost weaning mix using locally available food materials and vitamin A - rich sweet potato (Gauri variety) was formulated and standardized and assessed with infants of 6-18 months, and this mix was found to have good impact on infants between 6-12 months.

Focused group discussions conducted in Jaipur, Mahinsa, Simore and Kantamalim villages on resource base, traditional knowledge and participation of farmwomen in livestock production indicated that the bulk of chores related to livestock production and management fell on the shoulders of women, children and old people. They accounted for over 70 per cent of the total labour in various activities of livestock management.

Study conducted in Mahinsa village of Puri district revealed that majority of women involved in backyard poultry rearing were from scheduled and backward castes. Backyard poultry gave high returns, as the investment required in feed and medicine was low and, on an average, income of Rs 2000 per unit of 6-8 birds could be realized over a period of five months. Among livestock Mithun enjoyed high priority among farm families with respect to meat production and preference, agro-climatic adaptation and economic returns in Pfulseromi village of Jharnapani.

A study on involvement of tribal women in marketing of selected agricultural and important non-timber forest produces (NTFP) carried out in Orissa revealed that

the tribal women were involved in marketing of many agricultural produces such as cereals, pulses, vegetables, fruits, spices, value added products, fish and meat and also other items such as local wine (handia), salt, handicrafts and stationery. They were also engaged in the collection and marketing of forest based products such as honey, tamarind, mushroom, green leaves, jackfruits, jackfruit seeds and mango. Exploitation by middleman and distant market places were the major constraints in marketing.

Need based areas for customization of information related to agriculture and allied fields for farmwomen were identified for development of ICT modules with a view to improving the access to information on technological development.

The technical plan of action of All India Coordinated Research Project on Home Science focused on development of gender specific database and training modules for farm women, technology interventions for drudgery reduction in agriculture, nutritional security and health promotion of farm families, promoting vocational skills among adolescent girls, value addition to under-utilized natural fibre resources and empowerment of rural women for livelihood security. To disseminate the information and technologies tested and generated under the Project interface meetings with KVKs were organized. Different thematic areas such as value addition to natural dyes for income generation, effectiveness of trainers training module on drudgery reducing technology, women friendly improved tools and implements for drudgery reduction in farm and home activities, value added supplementary foods for nutritional security, empowering rural girls with life skills, training need assessment and PRA tools were identified for development of training modules.

Trainers' trainings programmes were organized on gender analysis, gender sensitization methods, capacity building of coastal fisher women and empowerment of women in agriculture. Training programmes with a total participation of about 500 farmwomen were conducted. A National Seminar on Women in Agriculture was organized on 4 December, 2009 on the occasion of the Women in Agriculture Day.

Hindi Chetna Mas was observed by organizing various literary and awareness programmes. The staff members of the Directorate participated in various seminars, workshops and conferences. Capacity building of DRWA scientists was undertaken through national and international trainings and workshops. □

INTRODUCTION

Brief history

The Working Group on Agricultural Research and Education constituted by the Planning Commission for the formulation of the Eighth Five Year Plan (1992-97) recommended for establishment of a National Research Centre for Women in Agriculture (NRCWA). Accordingly, the Indian Council of Agricultural Research established the NRCWA in the month of April 1996 at Bhubaneswar and has since been upgraded as the Directorate of Research on Women in Agriculture (DRWA) from the year 2008. A sub-centre of DRWA is located at the campus of CIAE, Bhopal.

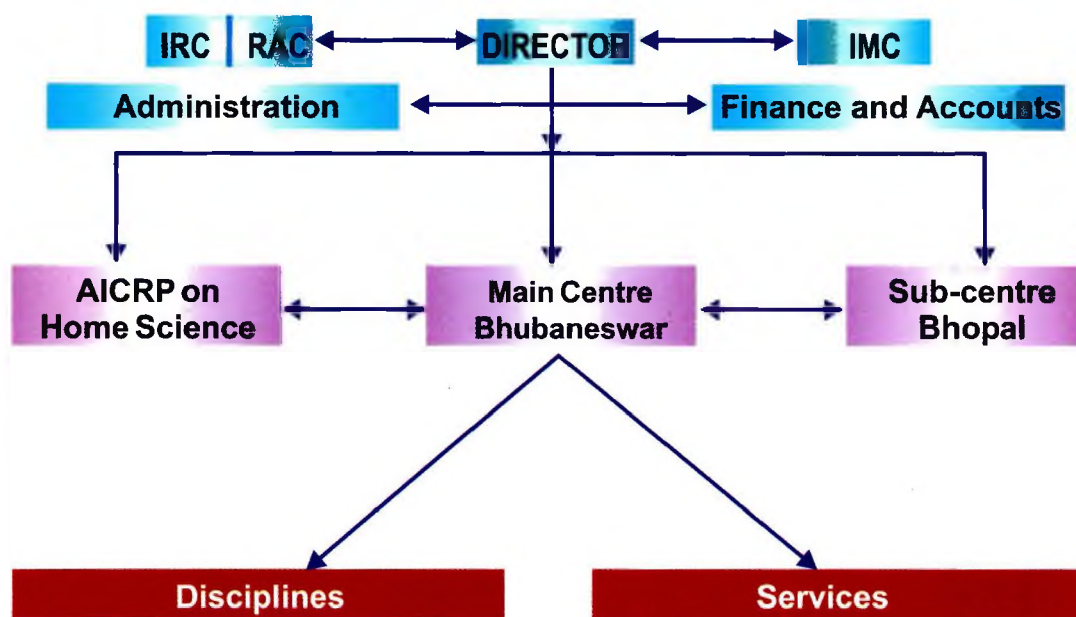
Mandate

Carrying out basic, strategic and applied research to identify gender issues and test appropriateness of available farm-technologies/ programmes/policies with women perspective. To do training and consultancy for promoting gender mainstreaming in research and extension for empowerment of farmwomen and capacity building of scientists, planners and policy makers to respond to the needs of the farmwomen.

Objectives

- Conduct basic, strategic and applied research on gender issues in agriculture and allied fields
- Create and maintain database on gender specific information about men's and women's role in food production and agriculture development for effecting technologies, programmes and policies
- Test the appropriateness of farm technologies and programmes and policies in terms of gender sensitivity in collaboration with relevant national and international organizations and suggest suitable modifications
- Develop drudgery reducing options for decreasing the workload and increasing the efficiency of women
- Develop gender sensitive modules and methodologies for transfer of technology
- Develop gender sensitive training modules and materials and impart trainings, seminars and workshops for capacity building of scientists, researchers, planners and policy makers for gender mainstreaming and practical application of gender related technologies
- Develop and publish gender sensitive materials, create network linkage through journals and information sharing
- Develop system of managing and sharing gender related knowledge to support institutions and government in their efforts to mainstream gender in policy and programmes; and
- Develop effective evaluation and monitoring arrangements for gender mainstreaming

Organogram of DRWA



- Agricultural Economics
- Agricultural Extension
- Agricultural Statistics
- Agronomy
- Entomology
- Family Resource Management
- Farm Machinery and Power
- Fish Processing Technology
- Food and Nutrition
- Human Development
- Horticulture
- Livestock Production and Management

- Technical Cell
- PME Cell
- Training and Consultancy
- ARIS Cell
- Library and Documentation
- Vehicles

Budget and expenditure of DRWA for the year 2009-10

(Rs in lakhs)							
S. no.	Major heads	PLAN			NON-PLAN		
		BE	RE	Exp	BE	RE	Exp
A.	Recurring						
1.	Establishment charges	10.00	0.00	0.00	125.00	255.00	255.00
2.	OTA				0.05	0.00	0.00
3.	TA	7.00	7.00	7.00	0.95	0.07	0.07
4.	Contingencies including Network	172.05	158.65	158.65	15.00	16.46	16.46
5.	HRD	5.00	5.00	5.00			
6.	Minor works				2.00	1.63	1.63
Sub-total (A)		194.05	170.65	170.65	143.00	273.16	273.16
B.	Non-Recurring						
7.	Equipment including network and furniture	64.25	52.63	52.63	0.00	0.00	0.00
8.	Works	108.00	134.40	134.40	0.00	0.00	0.00
9.	Library	10.00	8.62	8.62	0.00	0.00	0.00
Sub-total (B)		182.25	195.65	195.65	0.00	0.00	0.00
Grand Total (A)+(B)		376.30	366.30	366.30	143.00	273.16	273.16

Budget and expenditure of AICRP on Home Science for the year 2009-10

(Rs in lakhs)				
S. no.	Head	B.E.	R.E.	Exp.
1.	Pay and Allowances	382.37	382.37	382.37
2.	T.A	23.83	23.83	19.97
3.	Contingency	151.63	151.63	151.49
4.	N.R.C	87.87	87.87	87.95
	Total	645.70	645.70	641.78

Staff strength as on 31 March, 2010

Category	Sanctioned	Filled	Vacant
Scientific	17 (16+1)	16 (15+1)	01
Technical	07	07	0
Administrative	08	06	02
Supporting	01	01	0
Total	33	30	03

Scientific staff (Main and Sub-centre)

S. no.	Discipline	Sanctioned Strength			In position as on 31 March, 2010		
1.	DIRECTOR (RMP)	1			1		
		Scientist	Senior Scientist	Principal Scientist	Scientist	Senior Scientist	Principal Scientist
2.	Agricultural Economics	1	0	0	1	0	0
3.	Agricultural Extension	0	1	1	0	1	1
4.	Agricultural Statistics	0	1	0	0	1	0
5.	Agronomy	0	0	1	0	0	1
6.	Entomology	0	1	0	0	1	0
7.	Family Resource Management	0	1	0	0	1	0
8.	Farm Machinery and Power	0	1	0	0	1	0
9.	Fish Processing Technology	0	1	0	0	1	0
10.	Food and Nutrition	1	0	0	1	0	0
11.	Human Development	0	0	1	0	0	1
12.	Horticulture	2	1	1	2	0	1
13.	Livestock Production and Management	0	0	1	0	0	1
	Total	4	7	5	4	6	5

Technical staff

Designation	Sanctioned post	In position as on 31 March, 2010
Technical Assistant (T-3)	6	6
Technical (T-1)	1	1
Total	7	7

Administrative staff

Designation	Sanctioned post	In position as on 31 March, 2010
Asstt. Administrative Officer	1	1
Asstt. Finance and Accounts Officer	1	1
Personal Assistant	1	1
Senior Clerk	2	2
Stenographer, Gr-III	2	1
Junior Clerk	1	-
Skilled Support Staff	1	1
Total	9	7

RESEARCH ACCOMPLISHMENTS

Development of gender information system in agriculture

Reference system on gender studies

Under the project Development of gender information system in agriculture, creation of a reference system on gender studies was taken up to provide students and researchers access to relevant references/studies and guide them in planning gender research. Two approaches were followed to collect the references- random, i.e. as and where available and systematic, i.e. source (journals) wise screening of articles to compile gender based articles database creation. References and studies after compilation are classified theme wise and entered in. Such a reference system would not only help researchers but may aid priority setting exercises in gender research. The reference system would cater three types of information; (1) references that would help researcher with title, source and year of publication, (2) references with available abstract on the study, (3) references with full paper.

So far about 2500 references and studies collected from various sources such as journals, annual reports, proceedings, books etc. and 1400 references entered into the database.

Data base on women in agriculture

For strengthening the data base on women in agriculture the data collected under the net work projects were also incorporated in the DRWA data base for which necessary data entry modules were developed using a structured template.

Search Options

Source: Thesis, Books, All
 Themes: Technology testing & refinement, Extension & institutional paradigms, Socio-economics
 Year of study:
 Region of study:
 Keywords:

GO... RESET
 PRINT CLOSE

TOTAL ITEM: 1038 Journal: 372 Annual Report: 42 Proceeding: 169 Thesis: 32 Books: 403 Double Click to see details

Study Title	Author(s)	Year Of Study	Summary
Microfinance through SHGs: An...	R.M Das	2004	Micro credit especially to poor women entrepreneurs is a notion that imbues ethics and s...
A study on decision behaviour ...	T.Aisugamani	1999	The study revealed that farm women were involved to the extent about 73 percent with re
Agricultural Labour in Rural La...	Unni, Jeemol	1998	-
An Assessment of women Eco...	Pathaik and Sallabala Devi	1995	The study revealed that landholding size and working hours of female were inversely rel...
Changes in Women's Employ...	Unni, Jeemol	1999	-
Changing Gender Roles in Irri...	Ahmed, B	1999	-
Comparative case studies of f...	Chakravarti	1999	It was found that Dutch and Indian farmwomen were regarded themselves as help us o...
Contribution and decision-mak...	H. Nanda	1994	The study revealed that women provided the high level of consultancy in decision-mak...
Actual and desired type of part...	Rani, J.DDShaw, A. M	1992	-
Adoption of feeding practices in...	Srinivasa, P. LDD Promila	1995	-
Agricultural revolutions--loss a...	Burman, B. K.R.DD	1975	-
Appraisal of women's work...	Singal, S.DDBalaishman	1998	-
Gender Disparities in Social W...	Datta, Anindita and Sinha, ...	1997	-
Gender roles in sweet potato pr...	Alcober and panilla	1999	Visayas of Philippines indicated that joint farming and decision-making were carried out
Gender, Trees, and Fuel: Socia...	Nesmith, C.	1991	-
Gendered Participation in Wate...	Meinzen-Dick R, Zwartjes...	1999	-
Impact assessment of farmwo...	C.H. Chandrasevi, D.V.S. R...	1999	It is observed that net returns per hectare increased with an increase in farm size. This i...
Impact of central sector schem...	K.N. Rai, S.E. Gangwar an...	1999	It has been observed that the gap in application of resources of both beneficiary and no...
Impact of Changing Cropping P...	Singh, Babu et al	1999	-
Impact of DMICRA scheme in te...	V.S. Khosla and D.P. Har...	2003	It is concluded that to generate employment in rural areas it is necessary to think of in...
Imparting rural women users' p...	M.S Swaminathan	1995	Women play a very significant and crucial role for the development of agricultural sector...
Increasing women's participati...	V.Puhazhaseendhi and B.Jay...	1999	There is a positive impact on the employment generation on 42% of group members wh...
IRDP and women Development...	D.K Ghosh	1993	The beneficiary farm women were enjoying more liberty in incurring the expenditure on v...
Living on the Edge Women, Env...	S. Venkateswaran	1992	More than 90% of the women workforce is engaged in the economic activities eg agricul...
Missing Females - A Disaggre...	Agarhota, S.B.	1995	-
Mushroom Cultivation for Inco...	Mehta and Sundarshan	2000	The study revealed that 22.50 percent trainees put the mushroom production technology...
New Technology of rainfed Agri...	S.R.S Arya and S.L. Shah	1994	The yield gap between the existing and potential level of food production was due to slo...
Panchayati raj and gender issu...	Neena, T.R	Jul-Sep 2002	-
Participation of rural farmwome...	G.L. Khastik and M. B. Pand...	1997	The result indicated that 57 percent of farmwomen had a medium level of decision mak...
Participation of women in agric...	Sudha Rani, P.DDRaju, V.T.	1991	-
Participative action of rural w...	George, Chelliah, Gandy...	2000	Modern technology in rice wheat system reduced the demand of male labour and incre...

Development of expert system for crop and animal enterprises (Network project)



The project is in operation at three Network centres viz; (i) Zonal Coordinating Unit, Bangalore (ii) Directorate of Extension Education, TNAU, Coimbatore (iii) Directorate of Extension Education, TANVASU, Chennai with Directorate of Research on Women in Agriculture, Bhubaneswar as the lead centre. Contents were generated for paddy, coconut, sugarcane, banana and ragi covering different aspects such as agronomic practices, plant protection methods and post harvest techniques. Expert system shell and image based contents of home page were created. High resolutions along with IF-THEN rules and facts were used. Under animal husbandry contents management of important diseases and nutritional disorder of dairy cow, sheep and goat, and poultry birds have been collected and documented. Farmers' frequently asked question related to animal husbandry was also collected. Content development of expert system in multilingual mode viz Tamil, Kanada and Malayalam with the assistance of resource centres is in progress. Development of content for pest management in rice is in progress at DRWA.

Public private partnership for gender mainstreaming in agriculture (Network project)

The project is in operation at six Network centres viz (i) Directorate of Research on Women in Agriculture, Bhubaneswar (ii) Kerala Agriculture University, Kerala (iii) Chaudhary Charan Singh Haryana Agricultural University, Hissar (iv) Assam Agricultural University, Jorhat (v) Avinashilingam University for Women, Coimbatore (vi) Maharana Pratap University of Agriculture and Technology, Udaipur.

A launching workshop was held on 21-22 July, 2009 at DRWA, Bhubaneswar. The workshop was attended by the scientists of DRWA and SAUs who are associated with the project. Identification and evaluation of PPP models is in progress.

PPP Models identified at different Network centers :

- ◆ DRWA: 8 in Orissa and 17 in Bihar
- ◆ Kerala Agriculture University : 17
- ◆ Avinashilingam University for Women : 35
- ◆ Assam Agriculture University : 6
- ◆ Maharana Pratap University of Agriculture and Technology : 6

A check list for gender auditing of the models was developed. A brainstorming session on strategies for assessing the projects with public private partnership was held at Avinashilingam University for Women on 24 February, 2010.

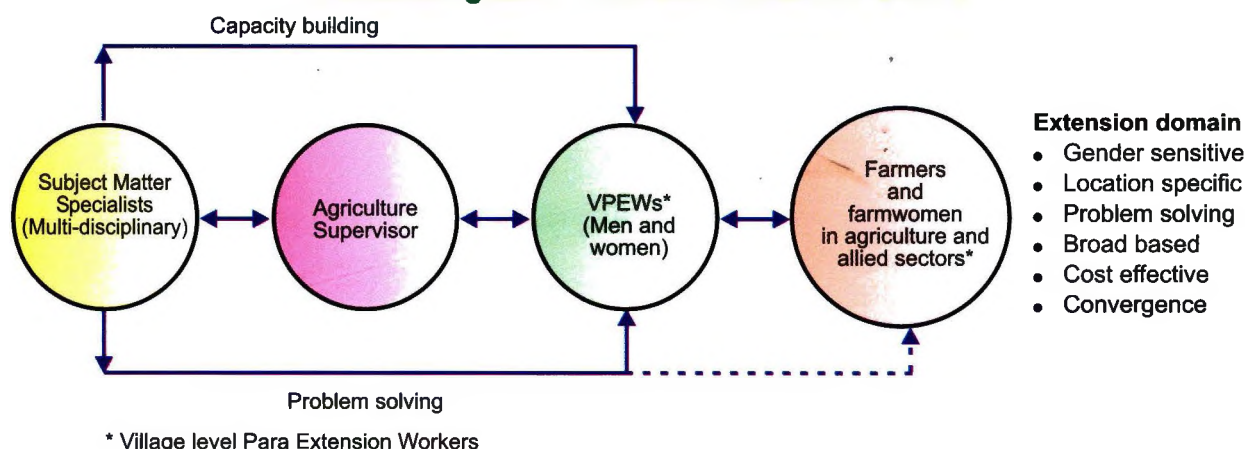
Designing gender sensitive extension model and testing its efficacy

The project aims to develop an extension model on public-private partnership to address gender sensitivity, cost effectiveness, leadership development among farmwomen, technological location specificity and subject matter support from specialists.

Philosophy of the model

Developing young leaders (men and women) in farming and enabling them to provide gender sensitive, location specific and broad based extension services at village level for sustainable development in agriculture and allied fields.

Schematic gender sensitive extension model



Capacity building of VPEWs

For capacity building of the VPEWs, three days pre-*Kharif* training was organized in which emphasis was given to the areas of pest management in *Kharif* vegetables, identification problems in nutrition garden-cum-seed production units, cultivation practices of major vegetable crops, health and sanitation, productive use of leisure time of farmwomen, critical steps in rice farming in upland and medium land conditions, problems in the management of cow, sheep and goat in rainy season and critical measures to overcome the problems, nursery management and pond management for fish farming, identification of rice pest and disease symptoms and IPM in rice, monitoring and evaluation of para workers' activities, assessment of project impact and gender sensitive extension approaches with emphasis on gender mainstreaming.

Pre-*Rabi* training of three days was held for VPEWs covering the need based areas of the farmwomen and farmers of the locality. Three review meetings of VPEWs were conducted to review the progress of project.

A field visit was organized in Simore and Kantamalim villages. The outcomes of the visit revealed that the VPEWs were actively involved in the transfer of farm technology, problem solving, demonstrations, field visit and training etc. The farmwomen reported that extension services provided under the model were effective. Poultry rearing, homestead kitchen garden-cum-seed production unit, mushroom cultivation and rice cultivation have supported family nutrition and income. Diseases in small ruminants, feed preparation for livestock. Insect pest in crops, improved vegetable seed and seed storage were found suitable to them.

Forty demonstrations on mushroom cultivation, nutritional-cum-seed production unit, rice cultivation, vermicomposting, backyard poultry farming, eco-friendly pest management, IPM, cultivation of *arhar* in the bunds of rice field, carp fry production, fresh water fish farming and ornamental fish farming were conducted in the project area with the participation of 180 farmwomen and 80 men were tested in gender perspective (Table 1).

Farm literature on 17 topics in local language were provided to VPEWs for building awareness and improving their knowledge. Farm advisory services, meetings and group discussions relating to the needs and problems of farmwomen and farmers were taken up by VPEWs.

Monitoring and evaluation of the performance of VPEWs at six months interval revealed that there was a considerable increase in the efforts of para-workers in farmers and farmwomen contact, field visits undertaken, identification of farm problems, conducting demonstrations and contact with development agencies (Table 2).

Table 1. The need based farm interventions implemented through the VPEWs

Activity	Kantamalim	Simore	Padasahi	Tanglbanta
Paddy straw mushroom	One SHG	One SHG	One SHG	One SHG
Nutritional-cum seed production unit	45 Farmwomen	45 Farmwomen	30 Farmwomen	3 Farmwomen
Backyard poultry farming	85 Farmwomen	85 Farmwomen	30 Farmwomen	30 Farmwomen
Cultivation of green gram	0.5 acre	0.25 acre	-	-
Commercial cultivation of vegetables like coriander and palak	-	-	-	0.25 acre
Bitter gourd cultivation	-	0.25 acre	0.5 acre	0.5 acre
Pest Management (neem based and chemical base)	0.25 acre	0.25 acre	0.25 acre	0.25 acre
Pheromone trap	-	5	15	-
Vermicomposting	One unit	-	One unit	One unit
Introduction of improved arhar (<i>Cajanus cajan</i>) in the bund of paddy field	10 units	10 units		
Demonstration on de-worming in cattle and goat	10	10		
Ornamental fish farming	-	-	One unit	Two units
Carp fry production and fish farming by WSHG	One	One	One	One
Rice cultivation	Two units	Two units	Two units	Two units
Value addition of mushroom	One	One	One	One
Distribution of planting material	20	20	20	20

Table 2. Knowledge of VPEWs on farming

Total score = 30

Situation	Avg. score MVPEWs	Avg. score WVPEWs	Avg. pooled score VPEWs
Irrigated	21.50 (71.66)	16.50 (55.00)	19.00 (63.33)
Rainfed	24.00 (80.00)	20.00 (66.66)	22.00 (73.00)
Avg. pooled score	22.75 (76.83)	18.25 (60.83)	20.50 (68.33)

- Figures in parentheses indicate %
- Maximum score = 4

Inference

- Women VPEWs secured less score in comparison to men VPEWs which may be due to the influence of higher educational background of men para workers (Table 3 and 4)
- VPEWs in the rainfed villages secured higher score than those of irrigated villages which may be due to relatively higher demand for extension services in the former

Table 3. Performance rating of VPEWs

Maximum score = 4

Parameters	Mean score WVPEWs	Mean score MVPEWs	Mean score (pooled)	Rank
Quality of work performed	2.58	2.91	2.74	II
Amount of effort expended on work	2.33	2.58	2.45	VIII
Speed of work	2.41	2.66	2.54	VI
Quantity of work	2.66	2.91	2.78	I
Capacity for work performance	2.49	2.91	2.70	III
Ability to work without supervision	2.33	2.66	2.49	VII
Ability handle different activities	2.25	2.83	2.54	VI
Dependability	2.33	2.66	2.49	VII
Ability to get along with others	2.49	2.66	2.57	V
Punctuality	2.83	2.66	2.74	II
Planning ability	2.08	2.33	2.20	V
Initiative to work	2.16	2.41	2.28	V
Over all performance	2.49	2.83	2.66	VIV
Avg. performance score	2.42	2.69	2.55	IV

Table 4. Factors influencing the performance of VPEWs

S. no.	Factors (X)	Spearman rank order correlation
1.	Age	-0.273 (NS)
2.	Education	0.442 (NS)
3.	Caste	0.352 (NS)
4.	Marital status	0.027 (NS)
5.	Knowledge in farming	0.513 (NS)
6.	Out side contact with agencies for development	0.740 *
7.	Social participation	0.815 *

* Significant at 0.05 level

Salient findings

- The performance level of men para workers was found to be higher than women para workers
- Out of seven variables tested for studying the association with performance level, it was found that social participation and out side contact with agencies for development were significantly associated with performance
- It may be suggested that persons with good social participation, outside contacts for development, knowledge in farming and formal education may be better suited for the taking the role of para worker

The interventions such as backyard poultry farming, carp fry production, rice cultivation by WSHGs, enhancing *arhar* production through bund planting, mushroom cultivation and eco-friendly pest management with the involvement of VPEWs yielded encouraging results. Thus, VPEWs had proved to be good intermediaries for effective transfer of gender sensitive technologies or practices that would lead to gender mainstreaming in agriculture.

Involvement of tribal women in marketing of selected agricultural and non-timber forest produces (NTFP) in Orissa

The study was carried out in Koraput district of Orissa as about 50 per cent of population of Orissa is tribal. Ten important markets of the district, 100 tribal women and 20 traders/middle men were identified for the study. An interview schedule for examining the participation of tribal women in marketing was developed and data collection is in progress. Three methods such as (i) PRA and case studies in selected villages, (ii) observation—at the markets and (iii) focused group discussion at community level were used for preliminary data collection. Four markets were visited and data were collected (Table 5).

Table 5. The market visited

S. no.	Name of the market	Distance from Koraput (km)	Frequency/ week	Market timing	No. of dependant people	Market facilities
1.	Kunduli	45	Weekly	8 am to 2 pm	10,000 to 12,000	Open space
2.	Damanjodi	25	Weekly	8 am to 2 pm	5,000 to 6,000	Open space
3.	Similiguda	24	Daily	4 pm to 8 pm	1,000 to 2,000	Road side open space
4.	Koraput	1	Daily	4 pm to 8 pm	2,000 to 3,000	Road side small open place

For weekly market, the timing was 8 am to 2 pm in the specific place and the daily markets had no specific place. No shelter was available in the markets to give protection from sun and rain.

Table 6. Items marketed by tribal women

S. no.	Item	Produce	Method of measurement
Agricultural produce			
1.	Pulses	Black gram, horse gram, kandula, dry beans, dry peas and red gram	Measure with tin containers
2.	Cereals	Ragi, rice, wild rice (suan) and maize	
3.	Vegetables	Cabbage, radish, beans, pumpkin, brinjal, gourds, sweet potato, potato, tomato, plantain, banana stem, papaya, green leaves, cauliflower and chili	In small heaps
4.	Fruits	Banana, mango, jack fruit and pineapple	Weighing machine
5.	Meat/fish	Dry fish and fresh fish (prawn)	Use both weighing machine and scoop
6.	Spices	Dry and raw turmeric, mango jelly, onion, garlic and ginger	In small heaps
7.	Handicrafts	Bamboo made, clay made and brooms	Piece rate
8.	Stationery	Glass bangles	In dozens
9.	Value added food products	Varieties of sweets, snacks, tea, roasted maize, puffed rice and fried peas	Piece rate and tin container
10.	Others	Salt and household utensils	Measure with tin containers

Non timber forest produce

1.	Honey	Measure in bottles
2.	Tamarind	Weighing machine
3.	Mushroom	In small heaps
4.	Green leaves	In bundles
5.	Jackfruits	In piece rate
6.	Jackfruit seed	In small heaps
7.	Mango jelly (value added to mango pulp)	In small heaps



It was observed from Table 6 that the tribal women were involved in marketing of most of the agricultural produces such as cereals, pulses, vegetables, fruits, spices, value added food products, meat, fish as well as local wine (*handia*), salt, handicrafts, stationery and glass bangles. These items were sold with the help of tin/ aluminum containers or in scoops and heaps. Weighing machine was used very rarely. In addition to a agricultural produces, the tribal women also were involved in collection and marketing of NTFPs such as honey, tamarind, mushroom, green leaves, jackfruit, jackfruit seed and mango.



The study indicated that lack of transportation, exploitation by middlemen and distant market places were the major constraints faced by tribal women. Lack of storage facility, inadequate bargaining skill, lack of shelter to protect them from rain and sun and lack of government fixed price were also reported as constraints.

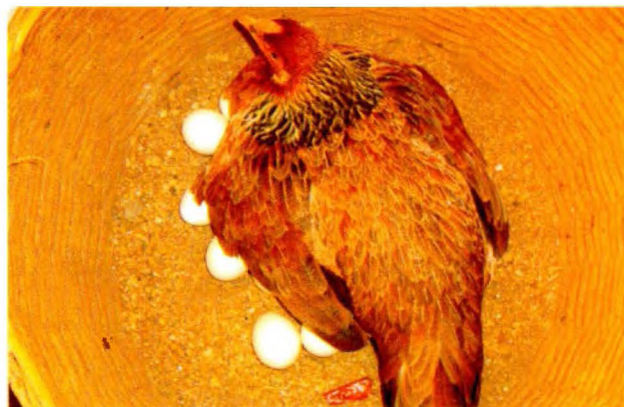
Resource base, traditional knowledge and participation of farmwomen in livestock production (Inter-institutional project)

The project is in operation at four centres viz (i) Directorate of Research on Women in Agriculture, Bhubaneswar (ii) Indian Veterinary Research Institute, Izatnagar (iii) National Research Centre on Mithun, Jharnapani (iv) National Research Centre on Pig, Guwahati.

DRWA, Bhubaneswar

Focused group discussions conducted in Jaipur, Mahinsa, Simore and Kantamalim villages revealed that the bulk of chores related to livestock production and management fell on the shoulders of the women, children and old people. They accounted for over 70 per cent of the total labour in various activities of livestock management. Feeding, watering and cleaning of shed were predominantly done by women whereas grazing, sale of animal and attending to sick animals including taking them to the veterinary dispensary were men's tasks.

Survey conducted in Puri district of Orissa revealed that majority of women engaged in backyard poultry (BYP) rearing were from schedule caste/tribe and backward castes and belonged to young age group with small family size of up to four members. Based on willingness, interest, resources



and ability to rear the chicks, fifteen women were selected for training. On-farm and off-farm trainings were conducted on various aspects of poultry keeping such as handling of birds, vaccination, preparation of housing, supplementary feeding, identification of ill birds and record keeping. Rearing of chick was taken up with farmwomen after imparting training on poultry keeping in backyard as an alternate livelihood for fisherwomen. Seven or eight one month old chicks (Vanaraja, CARI Devendra and RIR breed) were provided to women for rearing in their backyards.

Women reared the birds individually in their surroundings. In majority of the cases, housing was provided only at night and during adverse weather conditions. Most of the women have developed an innovative method of feeding their birds. They prepared feed using locally available forage resources such as amaranthus, trash fish and broken rice. All the ingredients were boiled together and fed twice to the birds.

Most of the birds lay three clutches of eggs a year and some birds lay even four times a year. The performance of birds was highly variable due to wide variation in management practices including feeding, housing and health control measures. In general BYP gave very high return, as the investment required (feed, medicine, etc.) was low, amounting to Rs 2000 per unit of 6-8 birds over a period of five months. Most of the women preferred Vanaraja and CARI Devendra birds for backyard system as both birds and eggs fetched high price compared to other breeds.

The socio-economic analysis indicated that at all stages of rearing such as egg, chick or chicken, BYP has a good potential as an income generating activity for resource poor women.

Participatory action research was initiated in Manmari village of Khurda district of Orissa to develop, refine and disseminate improved model for enhancing productivity of small ruminants to farmwomen. The interventions introduced for increasing productivity of small ruminants were (i) capacity building of farmwomen through village women link worker (ii) castration and replacement of males among farmers flock for breed improvement (iii) vaccination and deworming to reduce mortality and morbidity and (iv) supplementary feeding of concentrate made from locally available feed resources. On an average 20 per cent gain in body weight of lambs/kids is recorded due to supplementation of home made concentrate as compared to farmers' practice. Besides the increase in body weight all the animals of supplemented groups showed good health. Castrated male lambs/kids had more body

weight gain and fetched 20-25 per cent higher price than the uncastrated ones because consumers preferred the meat of castrated animals. Implementation of scheduled prophylactic health measures reduced mortality from 30-8 per cent and most of the farmers reported an increase in the growth rate of 20 -30 per cent in the animals between 6 and 12 months of age in their flocks.

Demonstrated round-the-year fodder production technology at DRWA farm for capacity building of various stakeholders. Fodder crops grown in the fodder museum are cow pea, maize, sorghum, pearl millet, oat, lucerne, siratro, stylo, clitoria and Hybrid Napier (Co-1, Co-2, Co-4, Josbanti, APBN-1, NB-21).



Stylosanthes hamata



Hybrid Napier

NRC on Mithun, Jharnapani

PRA was conducted in Pfutseromi and Thüvopisumi villages of Phek district in Nagaland, where majority of farmers depend on agriculture. Backyard poultry was raised by almost every villager. The crossbred cows were used only for milk production with an yield of 3-5 kg/day. The low productivity of crossbred cows appears to be due to poor feeding and breeding. The agro-climatic adaptation and disease resistance was found to be best for Tho-tho cattle. The local pigs were ranked first followed by Tho-tho cattle and local cows with respect to meat production, management expenses and economic returns. Next to pork poultry meat was preferred .

FMD was observed to be the most disastrous disease in ruminants. Both Mithun and local cattle were susceptible to FMD. The other diseases leading to economic loss were ranikhet in poultry, coccidiosis in rabbit and swine fever in pig.

Traditional knowledge of women with respect to livestock rearing

The traditional practices followed by farmwomen in both the villages with respect to pig rearing included

- Feeding of pigs with maize mixed with colocasia, yam and tapioca
- In case of scarcity, banana pseudostem and some wild leaves were boiled and fed to the pigs
- The general view was that the slurry prepared by mixing and cooking colocasia, yam, tapioca, banana pseudostem, wild leaves and crushed maize was more nutritious and had better digestibility
- Mixing of wild leaves increased the intake and growth.

Introduction of livestock interventions for enhancing livelihood of farmwomen

Rabbit farming was introduced in both the villages and one pair of New Zealand White and Chinchilla breed of rabbit of about two months of age were supplied to each of 60 farmwomen for enhancing their livelihood.

Piggery was strengthened by introduction of improved breed, Hampshire cross. For this purpose one unit consisting of a boar and three gilt of six months was provided to a farmwomen in Pfeutseromi village. The boar was used for upgrading the local pigs by neighbouring farmers too. The piglets born out of the unit will be distributed among the women self-help groups of the village for enhancing their livelihood.

NRC on Pig, Guwahati

The study was undertaken to understand the participation of farmwomen in livestock production with special reference to piggery, their perception and knowledge about pig management, constraints therein and to identify the capacity of farmwomen to take up piggery. Data are being collected to examine the role and opportunities for the rural women in piggery. Two villages named Lela and Barigaon in the district of Goalpara were surveyed to study the village profile.



PRA was conducted in Lela and Barigaon to study the role of women in animal husbandry. The study used a number of tools including rapport building, participatory social mapping, activity profiles for men and women, seasonal calendar, preference ranking and scoring, focus group discussions, field observations and semi-structured interviews.

Livestock production and agriculture were major sources of income. Amongst livestock pig was most preferred animal and at least one or two pigs were available in all the households. Women played a vital role in the day-to-day activities in backyard pig rearing and accounted for two third of the labour. Men's work was seasonal whereas women's work was continuous throughout the year. Large number of livestock population existed in the region, however their productivity was very low.

IVRI, Izatnagar

Dairying was one of the major sources of employment, income and food security of rural families. Most of the activities in dairying were being performed by rural women following the traditional practices. Their participation was high as compared to the males spouse as it was perceived as extension of domestic activities for which women were responsible. Despite their contribution, women farmers were not recognized as the target group while delivering the animal health/development services as well as in trainings and extension activities by the line departments. Women from different categories of socio-economic status spent same amount of energy in performing various indoor animal

husbandry activities because none of them had adopted any energy saving measure. They spent about 860 calories per day in performing various animal husbandry activities. Feeding of dairy animals, watering, making of cow dung cakes/manure, cleaning of animals and shed, milking, churning, transportation of fodder, chaffing, care of sick animals and attending animal at the time of parturition were predominantly performed by the women in varying degrees depending upon the position in the family, age, caste and socio-economic conditions and the herd size,.

Drudgery prone animal husbandry activities carried out with existing tools, equipments and techniques were evaluated to identify the intervention points. The highest drudgery prone activity was chaffing followed by disposal of dung, cleaning of shed, preparing of cow dung cake and milking. The study revealed that total cardiac cost of work and physiological workload of rural women in performing the activities were very high with traditional tools. Identification of fertility problems, feeding of animals, vaccination schedule, care of



newly born calf and preparation of milk based products were the most preferred areas of training as reported by women. Lack of remunerative price for milk and milk products, high cost and irregularity of veterinary services and medicines as well as lack of knowledge in scientific dairying were the major constraints reported by about 87 per cent of women. In order to empower them, 20 women were provided on-campus training on scientific dairy farming. Two off-campus trainings on clean milk production and preparation of low cost animal ration based on local resources were organized. Demonstrations on area specific mineral mixture, vaccination against the HS and FMD and cultivation of perennial fodder were conducted in the selected area. The lack of leadership skill, low risk taking ability due to low involvement in decision making process and very little control over the physical assets and money earned by them were the constraints faced by them.

Enhancing livelihood of rural women through livestock production (Network project)

The project is in operation in five Network centres viz (i) Directorate of Research on Women in Agriculture, Bhubaneswar (ii) Indian Veterinary Research Institute, Izatnagar (iii) ICAR Research Complex for NEH Region, Umiam (iv) Veterinary College & Research Institute, Namakkal (TANUVAS) (v) PG Institute of Veterinary and Animal Sciences, Akola (MAFSU).

Different locations for conducting survey were selected based on the importance of livestock in livelihoods, adopting multi-stage random sampling technique. District was the main domain. Two blocks from each district (rainfed and irrigated) were selected based on rainfall and livestock density and three villages from each block were selected based only on livestock density (low, medium and

high). Forty to sixty households from each village were selected by using proportionate random sampling method. Based on land holdings the households were stratified into landless (no land), marginal (<1 ha), small (1-2 ha), medium (2-4 ha) and large (> 4 ha) farmers.

The preliminary analysis across the locations revealed that crop production was the main occupation of land owning families and majority of the landless respondents were working as farm labour. Livestock farming was their subsidiary occupation. Backyard poultry and goat rearing were very common in all the locations. Women's participation in livestock production was high compared to that of men. Men performed all the breeding related activities whereas the disposal of placenta was being done by the women. Men took the animals out for grazing whereas collection of grass / fodder and preparation of animal feed were women's responsibility. Less than 25 per cent of farm families cultivated fodder that too in small areas. Health management was men's responsibility in majority of households whereas other management practices such as cleaning of sheds, animals and farm utensils, milking and making of cow dung cakes were exclusively done by women. Most of the men dominated activities were decided by men independently and women oriented activities jointly. The participation of women in decision making in the joint activities was higher. Women controlled the income derived from the sale of milk and backyard birds, whereas both men and women jointly controlled the income derived from the sale of live animals. The income generated from livestock was mostly utilized for the education of children and purchase of seed/planting material.

Focused group discussions held at different locations revealed that women and men had different needs and interests, different livelihood opportunities and constraints in managing livestock as well as in coping with emerging challenges such as poor access to markets, services and technical information, periodic drought and flood and disease occurrence. The gender-based constraints, needs and opportunities in livestock production are given in Table 7. The gender role in livestock management, control over income and decision making is presented in Figure 1-3. However, gender role in livestock production was found rapidly changing for several reasons such as urbanization, migration of men for jobs, mechanization of agricultural and post harvest operations. Farmwomen were equipped with traditional livestock rearing practices/knowledge which is passed on from their ancestors and practiced since childhood.

Majority of the families were following the traditional breeding practices. High producing animals were treated mainly by the veterinarians. In the dairy animals in most of the cases deworming was not practiced and vaccination was done only against FMD and HS. None of the respondents was using disinfectants for cleaning the animals and their sheds. Most of them were feeding salt and concentrate to their animals but were not aware about the area specific mineral mixture, balanced diet, enriching fodder with urea or molasses and use of urea molasses mineral block. None of the respondents knew about keeping records of different livestock practices nor expenditure.

The major financial constraints reported by the respondents for non-adoption of technologies were lack of finance, difficulty in getting credit and in some cases high cost of technologies. Most of the respondents knew about the extension workers and showed interest in taking part in group discussions.

Annual Review Workshop of network project was conducted at Veterinary College and Research Institute, Namakkal on 24-25 February, 2010.

Table 7. Gender-based constraints, needs and opportunities in livestock production

Constraints	Needs	Opportunities
Low participation of women in livestock development programmes and training	• Gender sensitization for more participation of women in formal discussions • Increased access to information and use of visual aids where there is low level of literacy • Include women in training and development programmes • Organise training programmes in those periods when women are not involved in other activities • Organise training programmes in the village • Introduction of leadership development and confidence building measures	• Adoption of improved technology that can suitably be integrated in traditional production system • Raise awareness about potential of livestock in increasing household food security and household economies and promotion of gender equality • Conduct training programme in villages with flexibility in schedule and venue
Time constraint in livestock management during peak labour periods	• Introduction of labour-saving technologies/devices • Introduction of skills on livestock management, e.g. full hand milking, use of locally made crates, revolving stool for milking, use of long handle rake /spade for removing dung • Exposure visits and experience sharing in the successful enterprises	• Reduction in livestock mortality and morbidity • Reduction in women's drudgery • Development of alternate small enterprises as livelihood options
Low scale of production limiting access to inputs and markets	• Introduction of group approach/ women self help group /farmers' groups or associations • Facilitation of support services at village level (AI, castration, vaccination, deworming, credit etc.) through women self help groups • Training on capacity building of women SHGs for livestock enterprise development	• Improvements in access to inputs, technical assistance and marketing channels • Women's empowerment and gender mainstreaming
Lack of common pool resource (grazing, water and forest) for livestock production and other micro-enterprises	• Improved access of women to common pool resources through community participation and management • Develop mechanism at village level for provision of water and fodder during scarcity	• Improvement in the productivity of CPR • Enhance women's right to control and manage CPR and livestock • Increased livestock assets for the landless women
Informal and poor marketing system	• Improvements in infrastructure and transport services • Improving women's skills in value addition and processing	• Increased demand for livestock products and promote production

Figure 1. Gender roles in livestock management

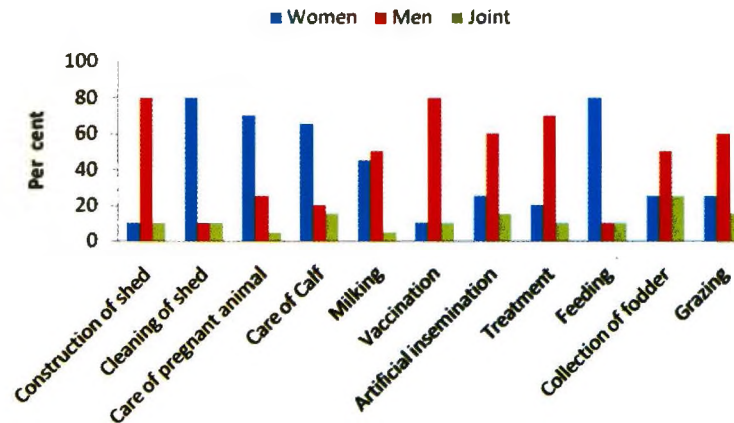


Figure 2. Gender roles in decision making

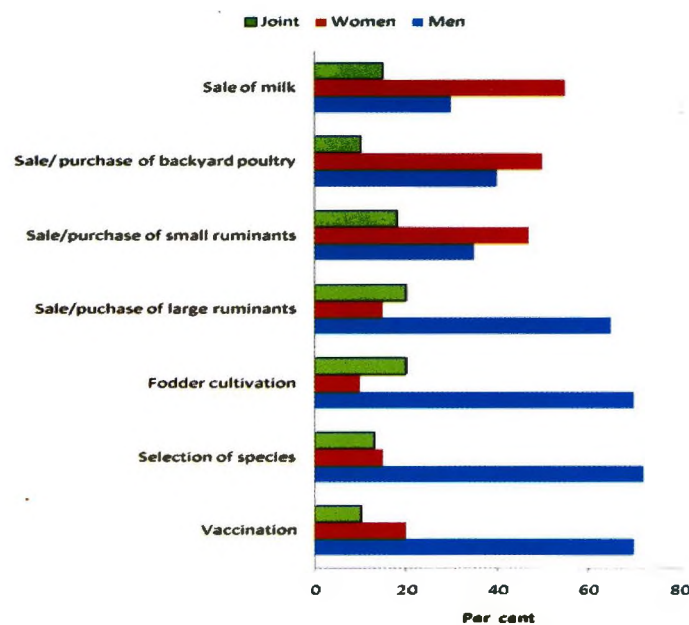
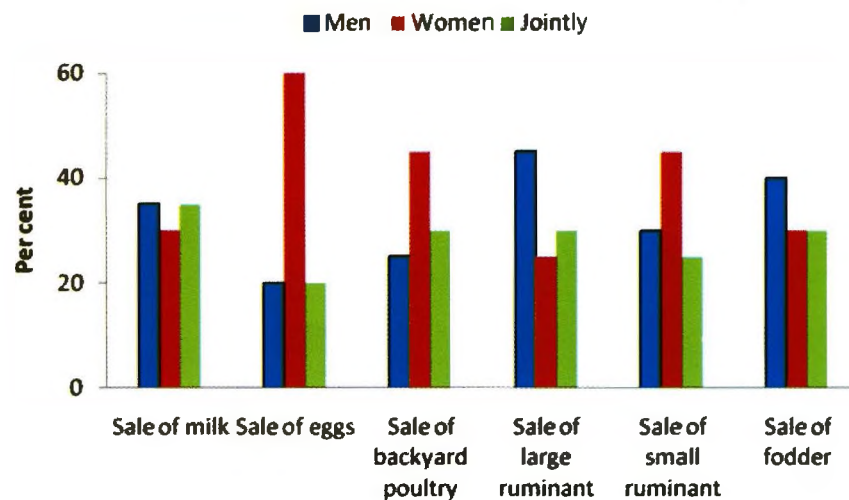


Figure 3. Gender role in control over income



Capacity building of costal fisherwomen through post harvest technologies in fisheries (Network project)

The project is in operation at seven Network centres viz (i) Directorate of Research on Women in Agriculture Bhubaneswar (ii) Central Institute of Fisheries Technology, Kochi (iii) Central Institute of Fisheries Education, Mumbai (iv) National Fisheries Development Board, Hyderabad (v) Fisheries College and Research Institute, Thoothukudi, TANUVAS, Chennai (vi) College of Fisheries, OUAT, Bhubaneswar (vii) KVK, West Godavari (ANGRAU).

With the aim of assessing the socio-economic conditions, women's role and gender issues in fisheries post harvest and refinement of technology in women perspective a network project on Capacity building of costal fisher women through post harvest technologies in fisheries was initiated 2009-2010. The methodology of the implementation of the project and the protocol of dry fish production to be implemented by the network centres in the following fishing villages were finalised :

Villages selected for technology intervention for capacity building

S. no.	Institute	Village
1.	DRWA	Arakhakuda, Bramhagiri, Puri, Orissa
2.	CIFT	Cherthala South Village, Cherthala South Panchayat, Alapuzha District, Kerala
3.	TANUVAS	Lourdammal Puram, Off Therespuram, Tuticorin, Tamilnadu
4.	OUAT	Nua, Golabandha, Ganjam, Orissa
5.	ANGRAU	Mollaparru, Mogalturu mandal, West Godavari, AP
6.	CIFE	Bhati Gaon, Madh Island, Malad (West), Mumbai, MH

An interview schedule to collect, benchmark information on the socio-economic conditions, role of women and quality status of dry fish produced in the coastal villages was developed and data collection is in progress. A workshop to review the progress was held on 9-10 March, 2010 at Bhubaneswar.



Assessment and refinement of aquaculture technologies for gender mainstreaming (Inter-institutional project)

Sub projects

- Assessment of mariculture technologies in gender perspective. (collaboration with CMFRI, Cochin)
- Development of strategies for gender empowerment through suitable brackish water aquaculture in Orissa state. (collaboration with CIBA, Chennai)
- Assessment and refinement of freshwater aquaculture technologies in gender perspective

Under the sub project, Assessment of mariculture technologies in gender perspective information was collected from Dhalavapuram and Malibagam of Kaunagappally thaluk of Kollam district and the Thekkebhagam and Vadakkekadu of Kasargod district representing southern and northern parts of Kerala. Data were collected from 200 mussel farming households from the villages selected. One man and woman from each household were



separately interviewed to assess the gender needs and gender roles with the help of a pre tested structured interview schedule. From the preliminary investigations it was found that the gender participation in mussel culture was very well defined and the women played a very important role. The important finding was that the financial dealings were done by women in all the cases. However some minor differences were observed between two districts in respect of work participation.

Under the sub project, Development of strategies for gender empowerment through suitable brackish water aquaculture in Orissa, crab fattening was taken up successfully for the second year in the island village, Mahinsa of Satapada in 0.5 acre pond involving 15 women. Since crab fattening is seasonal and restricted to August-December, backyard poultry was introduced as an additional income generating activity for the rest of year.

A farmer-scientists interface was organized with the participation of CIBA, Chennai for assessing the crab fattening technology in terms of gender participation and gender needs and it was found that :

- Women independently managed pond preparation, feeding, watch and ward and accounting whereas men's help was required for soft crab collection, trash fish collection, harvesting and marketing
- Women reported that they gained sufficient knowledge on the crab fattening practices and they could play supervisory role in the activity
- Social support, property right, timely availability of soft crab, marketing support and credit were the some of needs of women

Under the sub project, Assessment and refinement of freshwater aquaculture technologies in gender perspective, an interview schedule for the data collection on fry production, carp culture, integrated farming and fresh water ornamental fish culture was developed. Benchmark survey was carried out in Krishna district of Andhra Pradesh and Kendrapara district of Orissa.

Gender issues in rice based production system and refinement of selected technologies in women perspective (Network project)

The project is in operation in five Network centres viz (i) Directorate of Research on Women in Agriculture, Bhubaneswar (ii) Central Rice Research Institute, Cuttack (iii) Directorate of Rice Research, Rajendranagar, Hyderabad (iv) Kerala Agricultural University, Vellanikkara, Trichur (v) G. B. Pant University of Agriculture and Technology, Pantnagar.

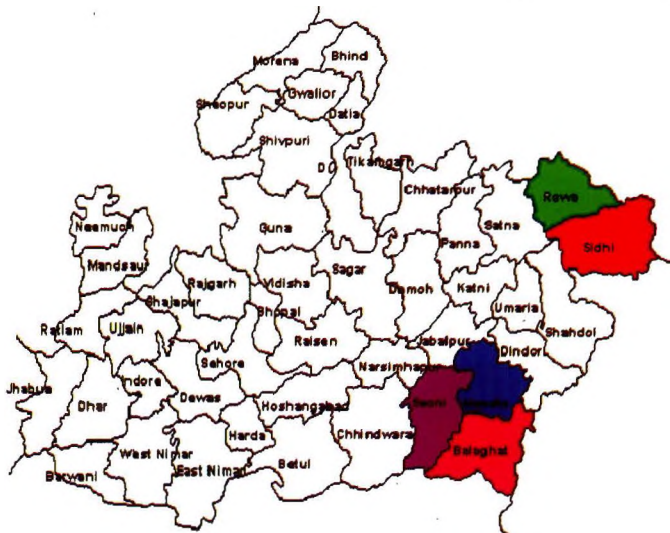
With a view to collecting gender disaggregated data on women's participation in rice production and identification of gender issues a survey was conducted in five major rice production systems/zones/districts. One rice growing block was selected from each of the five zones/districts and in each block, ten rice growing villages were identified out of which two villages were randomly selected for the survey. Data were collected from one man and one woman of the fifty randomly selected households in each village to make sample size of 1000 respondents (500 men and 500 women) belonging to 500 households. The centre wise progress is given below:

DRWA, Bhubaneswar

The survey was conducted in five major rice growing districts of Madhya Pradesh viz Balaghat, Rewa, Seoni, Mandla and Sidhi.

Balaghat, Seoni and Mandla are in the south eastern part of the state of Madhya Pradesh whereas Rewa and Sidhi are located in the north eastern boundary of the state. The total area under rice in these districts is 236159, 125427, 109382, 126527, and 35000 ha respectively.

Block level data on area under rice were collected from secondary sources for respective districts. Kimapur, Burghat, Bicchia, Hanumana and Sidhi, the highest rice growing blocks under each district were selected for the study. The villages selected in each block were Chikla, Newar, Bori-khurd, Pounar Kala, Orei Kanhari Kala, Patehra, Deora, Akaraha, and Dehli. Data collection was completed and processing is in progress.



Districts selected in Madhya Pradesh

GB Pant University of Agriculture and Technology, Pantnagar

Uttarakhand is broadly divided into two major zones i.e. plain and hilly zones and consists of 13 districts. Five districts viz Udham Singh Nagar and Nainital in the plains and Bageswar, Almora and Pithoragarh in hilly region were selected for the study and the survey in Udham Singh Nagar and Nainital was completed.

Central Rice Research Institute, Cuttack

Five districts viz Jagatsingpur, Cuttack, Balasore, Bargarh and Berhampur were selected from Orissa for data collection. Data collection completed in Orissa.

Kerala Agricultural University, Thrissur

Five rice farming zones viz Kuttanad and Onattukara in Alappuzha district, Kole in Malappuram, Irrigated rice in Palakkad and High range in Waynad district were selected. The corresponding blocks in each of the five farming zones viz Chambakulam, Ponnani, Muthukulam, Chittoor and Sulthan Batheri were selected and the data collection was completed in ten Panchayaths/ villages namely Nedumudi, Champakulam, Edappal, Vattamkulam, Cheppadu, Pathiyoor, Thathamangalam, Chittoor, Noolpuzha and Nenmeni.

Directorate of Rice Research, Hyderabad

Eight districts including four from Telengana Region (Mahboobnagar Karimnagar Rangareddy Warangal), three from Coastal Andhra (Bapatla, Guntur, West Godavari) and one from Rayalaseema (Kurnool) were selected for the survey. The data collection is in progress.

Refinement of storage pest management techniques in selected cereals, pulses, condiments and spices in gender perspective

Over the years, rural women have developed practices of storage pest management for the efficient and sustainable use of the resources available to them. With the aim of understanding various storage pest management practices in cereals, pulses, condiments and spices a study was carried out selecting nine Centres based on the area and production and representing different agro-climatic zones of India viz Orissa, Uttaranchal, Karnataka, Maharashtra, Andhra Pradesh, Assam, Haryana, Himachal Pradesh and Rajasthan. Data collection was completed in Orissa and in other states the same is in progress.



Paddy storage in plastic bags



Paddy / rice storage in Doli



Paddy storage in Khani



Rice /pulse storage in puduga made from paddy straw



Rice storage in Chawal-Dhavel



Earthen pots for the storage of small quantity of pulses and spices



Cleaning and trimming of onion for storage



Cleaning and drying of chilli for storage



Nilagiri fruits for pulse storage

Table 8. Storage structures documented from Orissa

S. no.	Storage structure	Material used	Items stored in the structure
1.	Pudug	Paddy straw	Rice and pulses
2.	Marai	Wood sheet and tin	Paddy
3.	Doli	Bamboo strip	Paddy and rice
4.	Chawal-Dhavel	Wood sheet	Rice
5.	Khani	Underground structure, Mud, cow dung and paddy straw	Paddy
6.	Dhaan gada	Base made of wood and stone	Paddy
7.	Plastic Akhaa (bag) over old vehicle tyre	Plastic	Paddy, rice and pulses
8.	Polyethylene bag	Polyethylene	Paddy earhead for seed purpose
9.	Akhaa (bag) over stone and wood base in common place/ separate room	Jute	Paddy, rice and pulses
10.	Metallic drum (Bin)	Tin	Paddy, rice, pulses and chili
11.	Charcoal drum	Tin	Paddy and chili
12.	Kerosene oil drum	Tin	Paddy
13.	Small container	Tin, glass, plastic	Chili, coriander, mustard, turmeric and cumin
14.	Pachia	Plastic or bamboo	Onion, red chillies, garlic and ginger
15.	Polyethylene bag inside tin container	Polyethylene, tin	Bay leaf (tejpatta), ginger, cinnamon (dalchini), cloves (loun), black pepper (golmirch) and small cardamom (small elaichi)

Table 9. Storage techniques documented from Orissa

S. no.	Storage technique	Item
1.	Drying and storing in jari akha (plastic bag)	Paddy and pulses
2.	Storage with garlic	Rice
3.	Storage with the use of turmeric powder	Rice
4.	Storage with chili	Rice, moong and urd
5.	Storage in jari akha (plastic bag) with the use of a mixture of begonia (<i>Vitex negundo</i>), pudina, bhusunga patra (<i>Murraya koenigi</i>), garlic and turmeric powder	Rice
6.	Storage between paddy in akha (jute bag) after sun drying	Moong and urd
7.	Storage with ash in akha (jute bag) after sun drying	Urd
8.	Storage with dry citrus (kamla) leaf + dry begonia leaf	Moong
9.	Storage with salt solution @ 100 g / kg followed by drying and storage.	Moong
10.	Storage with the use of turmeric rhizome	Rice
11.	Hanging of cobs	Maize
12.	Hanging of bundles	Garlic
13.	Storage in gunny bags/floor	Onion
14.	Storage over sand and pit	Ginger

From the data collected from Bhanjnagar in Ganjam district of Orissa it was observed that in the activities related to storage of paddy gender participation was 50:50 while it was 30:70 in cleaning, drying, carrying to the field for nursery sowing, transplanting, weeding, harvesting, carrying the produce from field to the house and threshing participation of women was predominant. A few of the farmwomen were using celphos powder without personal protective equipments (PPE) which is a health hazard specially when it is stored in jute bags. The structures and techniques for storage of cereals, pulses, condiments and spices documented are given in Table 8 and 9.

Data collection is in progress in Haridwar of Uttaranchal; Belgaum of Karnataka; Parbhani of Maharashtra; Warangal of Andhra Pradesh; Sivasagar of Assam; Hissar of Haryana; Kangra of Himachal Pradesh and Udaipur of Rajasthan.

Refinement and development of horticulture based cropping models for gender mainstreaming

Crop preferences of women and men

The data on preferences for horticultural crops collected from 300 farmers of six villages of Orissa revealed that mango, banana, jackfruit, coconut and guava were the most preferred fruits. Women preferred banana (77.3%), mango (66.7%), jackfruit (64%) and coconut (57.7%) for cultivation and men preferred mango (73.3%), banana (73.3%), coconut (54.7%) and guava (46.6%). Utilisation of backyard, value addition for family nutrition and use as fuel were other reasons reported by women.

Preferences for flower and medicinal crops

Flower crops were not taken up on commercial scale in the villages studied. Marigold, tube rose and gladiolus were cultivated in isolated fields. These crops were cultivated mainly for worship and beautification of the homesteads. Medicinal crops were grown for culinary and medicinal use.

Preferences for other crops

The cultivation of spices and medicinal plants excepting turmeric and ginger was negligible, limited to irrigated villages and were used mainly for home consumption.

Participation of women in horticulture

The data on participation of women in different activities of horticultural crops collected from 300 farmers of Orissa revealed that involvement of women in land preparation activities in nursery and field such as stubble collection and manure application was found to be about 60 per cent.

Nursery bed preparation, cleaning the seed and preparation of seed and sowing were performed by women. Planting of seedlings in the field was also done by women. Their participation in these activities was about 80 per cent. The participation of women in transplanting of vegetables was also about 80 per cent. The participation of women in fruit planting was less than that of men but their participation in frequent watering and nurturing of the newly planted seedlings was very high. Women performed these activities very efficiently with utmost care.

Weeding was predominantly done by women and their participation varied from 80-95 per cent in different fruits and vegetables. Lower participation (< 50 %) of women was found in irrigation, pesticide application and crop watch. Women workers were exclusively involved in harvesting of fruits, vegetables, flowers and spices. Harvesting of vegetables such as pea, chilli, okra, tomato, brinjal, potato, onion and spices was mainly done by women workers. Post harvest operations including cleaning, curing and grading were also performed by women labourers. The participation of women in harvesting and post harvest operations was higher than that of men. More than 60 per cent of cutting, cleaning, grading, packing and bundling was performed by women. Women's participation in transportation of crops from field to storage was high. Cleaning and grading of vegetables and spices at farmers' level and at traders' level were carried out by women.

Evaluation of horticulture based cropping models

Various fruit based cropping models were planned, laid out and initiated at DRWA farm for assessing the food, fuel, fodder and fibre production and employment generation. The details of these models and initial results are as follows :

Guava based cropping models

Four guava based models with four varieties of guava viz Allahabad Sufeda, Lucknow-49, Arka Amulya, Arka Mridula and four intercrops i.e. okra, cowpea, turmeric and pineapple were laid out. The estimated income generation from guava based models is given in Table 10.



Table 10. Estimated income from different guava based cropping models

Cropping model	Income from main crop(Rs)	Income from intercrops (Rs)	Income from Fuel (Rs)	Income from Fodder (Rs)	Income from Sale of Planting material (Rs)	Total Income (Rs/ha)
Guava- pineapple	61140	30496	46	0	25000	116682
Guava- okra	47172	5136	42	0	-	52350
Guava- cowpea	48138	6816	43	73	-	55070
Guava-turmeric	43200	54750	41	0	-	97991

* Guava - Rs 600/q, Pineapple - Rs 800/q, Okra - Rs 400/q, Cowpea 300/q, Turmeric - Rs 1500 /q, Fuel wood – Rs 10/-, Fodder - Rs 10/q, Pineapple plantlet - Rs 1/per

Mango based cropping models

Five mango based models with five varieties of mango viz Dashehari, Langra, Gulabkhas, Mallika, Amrapalli and five intercrops including okra, cowpea, tube rose, colocasia, marigold were laid out in 2007. Different intercrops were planted in the two years old mango orchard during Kharif 2009. Among all the combinations mango-marigold was found most profitable with estimated total income of Rs 69460/ha.

Table 11. Estimated income from different cropping sequences

Cropping model	Income from mango (Rs)	Income from Intercrop I*	Income from Intercrop II*	Income from fuel (Rs)	Income from fodder (Rs)	Total income (Rs/ha)	Employment (man days/ha/ year)
Mango-cowpea-radish	-	10290	5052	130	1707	17179	272
Mango-okra-french bean	-	8384	20418	120	1073	29995	277
Mango-tuberose	-	10194	-	130	-	10324	172
Mango-marigold	-	69300	-	160	-	69460	271
Mango-colocasia	-	14000	-	130	-	14130	242

* Okra - Rs 400/q, Pea - Rs 600/q, Cowpea - Rs 300/q, French bean - Rs 600/q, Tube rose - Rs 0.50/per Colocasia - Rs 400/q, Fuel wood - Rs 10/q, Fodder - Rs 10/q

Mixed fruit based cropping model

The mixed fruit based model consisting of minor fruits viz custard apple, bael, anola, sapota and lemon was planted in September, 2008. The intercrops viz marigold, cow pea, tube rose and fodder grasses including *Stylosanthes*, *Bracharia humidicola* and congo grass were planted between the crops in *Kharif* season. Highest yield was recorded in cowpea followed by marigold. Among the fodder crops the yield of congo grass was higher than *Stylosanthes* and *B. humidicola*. The highest income was estimated in mixed fruits-marigold (Rs 58805/-ha) combination with highest potential for employment generation (Table 12).



Table 12. Estimated income from different cropping sequences

Cropping system	Income from minor fruits (Rs)	Income from intercrops (Rs)	Income from fuel (Rs)	Income from fodder (Rs)	Income (Rs/ha)	Employment (days/ha/year)
Minor fruit-marigold	-	58800	5	-	58805	248
Minor fruit-cow pea	-	13530	4	-	13534	228
Minor fruit- tube rose	300	2441	5	-	2446	223
Minor fruit-stylo	-	422	4	-	426	125
Minor fruit- <i>B. humidicola</i>	300	950	7	-	1257	128
Minor fruit- congo grass	-	7920	6	-	7926	143

* Marigold - Rs 1500/q, Cow pea - Rs 300/q, Tube rose - Rs 0.50/per, Fuel wood -10/q, Fodder (Crop) - Rs 20/q, Fodder (residue) - Rs 10/- q, Lemon - Rs 1000 q/ha

Coconut based cropping model

Five varieties of coconut viz SSG, Guam, British Solomon Island, Philippines ordinary and Saint Vincent were planted in September, 2008 to initiate coconut based cropping system. Various intercrops such as turmeric, colocasia, elephant foot yam, cowpea and cassava were planted in between these plants in *Kharif* 2009. Among the intercrops, highest yield (134.5 q/ha) was recorded in tapioca followed by elephant foot yam (64.08 q/ha). Highest income was estimated in coconut-turmeric cultivation (Rs 47103/ha) followed by coconut-tapioca (Rs 40372/ha) and coconut-elephant foot yam (Rs 38463/ha) as presented in Table 13.

Table 13. Estimated income from different cropping sequences

Cropping	Income from coconut (Rs)	Income from intercrop (Rs)	Income from fuel (Rs)	Income from fodder (Rs)	Total income (Rs/ha)	Employment (days/ha/year)
Coconut-turmeric	-	47085	18	-	47103	238
Coconut-colocasia	-	19644	15	-	19659	235
Coconut-elephant foot yam	-	38448	15	-	38463	232
Coconut-cow pea	-	10833	14	-	10847	228
Coconut-tapioca	-	40290	82	-	40372	275

* Cowpea - Rs 300/q, Gladiolus - Rs 0.50/per stick, Colocasia - Rs 400/q, Yam- 500/q, Fuel wood -10/q, Fodder-10/q, Elephant foot yam -Rs 600/q, Tapioca -Rs 300/q

Cashew nut based cropping models

Six varieties of cashew nut viz H-2-16, H-303, BH-6 (Jagannath), BH-85 (Balbhadra), BH-1608, NRCC Selection-1 were planted in September, 2008 to initiate cashewnut based cropping system. Various intercrops such as pineapple, tapioca, okra, lemon, congo grass and stylo were planted in Kharif 2009. Okra gave a very low yield due to failure of monsoon in the initial months of cropping. In pineapple there was 19.3 per cent flowering and most of them bore fruits. Highest fuel yield was estimated in cashewnut-tapioca combination. The income generation was also highest in cashewnut- tapioca (Rs 37225/-/ha; Table 14).

**Table 14. Estimated income from different cropping sequences**

Cropping system	Income from cashew nut (Rs)	Income from intercrop (Rs)	Income from fuel (Rs)	Income from fodder (Rs)	Total income (Rs/ha)	Employment (days/ha/year)
Cashew nut-pineapple	-	-	32.6	-	326	277
Cashew nut-tapioca	-	36000	1225	-	37225	275
Cashew nut-okra	-	6480	29.8	-	6778	195
Cashew nut-lemon grass	-	-	41.2	-	412	135
Cashew nut- vongo grass	-	920	31.5	-	1235	145
Cashew nut-Dtylosanthes	-	260	34.1	-	601	135

* Okra -Rs 400/q, Fuel wood – Rs 10/q, Fodder – Rs 20 /q, Tapioca (cassava) – Rs 300/q

Horti-silvi-postural models

Two horticultural crops namely drumsticks and curry leaf and six fodder crops were planted in August, 2008 to develop horti-silvi-postural models for the dry and barren land. The fodder yield was also highest in Napier grass followed by *B.humidicola*. The highest income was estimated in drumstick-napier grass (Rs 11600/ ha). This was followed by drumstick-*B.humidicola* and drumstick-guinea grass.

The fodder yield was also highest in Napier grass followed by guinea grass. The highest income generation was estimated from curry leaf- Napier grass (Rs 11600/ ha) which was followed by curry leaf- *B.humidicola* and curry leaf -guinea grass.

Storage studies in zero energy cool chamber

Low cost zero energy cool chamber was evaluated for storage of pineapple and guava along with various packing materials. Pineapple fruits were stored in low cost zero energy cool chamber at ambient temperature after packing with different materials viz polyethylene bags, paper bags, newspaper and paddy straw and observation on fruit weight, size, volume, total soluble solid (TSS), acidity, colour and organoleptic values were recorded. The results revealed that physiological weight loss was 12.56 per cent in ambient storage as compared to 5.4 per cent in low cost zero energy cool chamber. The total soluble solid (TSS), acidity, fruit colour development and retention of colour was higher in zero energy cool chamber. Pineapple stored in cool chamber had a shelf life of eight days with less physiological weight loss as compared to five days under ambient conditions and also scored high organoleptic values. Among the packing materials, the physiological weight loss was less in polyethylene bags (3.51 %) followed by paper bags (6.26 %) and newspaper (6.95 %) under ambient conditions whereas the same was 1.58 per cent in paper bags and 2.10 per cent in polyethylene bags in the zero energy cool chamber. Colour and organoleptic values were superior in fruits packed in newspaper followed by paddy straw. Thus packing of pineapple in polyethylene bags or newspaper and storage in low cost zero energy cool chamber can increase the period of availability of pineapple (Table 15).

Table 15. Effect of packing materials and storage environment on weight loss in pineapple

Storage condition and packing material	Per cent weight loss (days of storage)							
	1	2	3	4	5	6	7	8
Room temperature								
Control	1.17	3.27	6.60	9.69	12.56	-	-	-
Polyethylene bags	0.10	1.11	1.71	3.51	5.42	-	-	-
Paper bag	1.09	2.46	4.11	6.07	8.99	-	-	-
News paper	1.51	3.26	5.28	7.82	9.32	-	-	-
Paddy straw	0.26	3.45	5.56	7.56	9.97	-	-	-
Zero energy cool chamber								
Control	1.23	2.0	3.19	4.0	5.04	6.30	7.18	7.78
Polyethylene bags	0.30	0.80	1.1	1.55	2.10	2.65	3.22	3.52
Paper bag	0.09	0.40	1.55	1.19	1.58	2.21	3.09	3.54
News paper	0.54	1.07	2.10	2.25	2.90	3.59	4.12	4.59
Paddy straw	1.14	2.35	2.95	3.13	4.34	5.47	6.37	7.21

Storage studies in guava

The guava fruits were stored in low cost zero energy cool chamber and in ambient temperature after packing in different packing materials viz polyethylene bags, paper bags, newspaper and paddy straw and observations were made on the fruit weight, size, volume, total soluble solid (TSS), acidity, colour and organoleptic values. The result revealed that physiological weight loss was 26.38 per cent in ambient storage as compared to 13.10 per cent in the low cost zero energy cool chamber after four days of storage. The total soluble solid (TSS), acidity, fruit colour development and retention of colour was better in zero energy cool chamber. Guava fruits stored in cool chamber had six days of shelf life with less physiological weight loss as compared to four days under ambient condition. Among the packing materials, the physiological weight loss was lowest in polyethylene bags (11.38 %) followed by paper bags (18.88 %) under ambient temperature, whereas in zero energy cool chamber the weight loss was 4.11 per cent in paper bags and 5.46 per cent in paper bags. The colour development and organoleptic values were superior in fruits stored in newspaper followed by paddy straw. Packing of guava in polyethylene bags or newspaper with storage in low cost zero energy cool chamber can increase the shelf life of guava making its available for longer period (Table 16).

Table 16. Effect of packing materials and storage environment on weight loss in guava

Packing material	Percent weight loss / days of storage											
	1		2		3		4		5		6	
	RT	ZECC	RT	ZECC	RT	ZECC	RT	ZECC	RT	ZECC	RT	ZECC
Control	6.87	5.20	13.86	8.29	20.35	10.40	26.38	13.10	-	16.38	-	18.67
Polyethylene bags	2.33	2.08	3.59	2.86	7.37	4.03	11.38	5.46	-	6.89	-	8.37
Paper bag	5.17	1.04	8.63	4.03	12.75	3.09	18.88	4.11	-	5.75	-	8.03
News paper	6.85	2.78	11.09	5.46	16.42	5.85	19.57	7.54	-	9.33	-	10.71
Paddy straw	7.25	4.94	11.68	6.20	15.88	6.57	20.94	9.11	-	11.49	-	13.38

RT- room temperature, ZECC- zero energy cool chamber

Garland making in marigold

Marigold is one of the important flower crops grown for use as loose flowers and garland. Marigold was grown in the horticulture based cropping models. Some of the flowers were used for garland making which was profitable and provided employment for an estimated 150 man days per hectare per year.

Comparison of local and improved weeding and cutting tools

Evaluation of improved weeding and cutting tools indicated that women and men preferred them over the local tools. The use of these tools were limited by non availability and cost.

Table 17. Gender preference for tools and implements

Feature	Tool/implement																			
	Katuri (bill hook)		Rake		Tooth rake (panja)		Big Bill hook		Kuradhi (khurpa)		Big khurpa		Bulb planter		Karani (flat khurpi)		Hedge shear		Garden fork	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Cost	2	2	2	2	3	3	1	1	2	2	3	3	2	2	3	3	3	1	2	2
Weight	3	3	3	3	3	3	2	1	3	2	3	2	3	3	5	5	3	1	3	3
Size	3	3	3	3	3	3	2	1	1	1	3	2	3	3	3	3	3	1	3	3
Size of handle	3	3	1	3	3	3	2	1	2	1	3	2	3	3	2	3	3	1	3	3
Easiness in handling	3	3	1	3	1	3	2	1	3	1	3	2	3	3	2	3	3	1	3	3

Scale: **Cost**- 1-costly, 2-average, 3- cheap **Weight**: 1-very heavy, 2-heavy, 3-comfortable, 4-light, 5-very light

Size: 1-very big, 2-big, 3-comfortable, 4-small, 5- very small **Size of handle**-1-very long, 2-long, 3-comfortable, 4-small, 5-very small

Ease of in handling- 1-very difficult, 2-difficult, 3-average, 4-comfortable, 5-very comfortable

Table 18. Gender preference for tools and implements

Feature	Tool /implement																					
	Liner		Spade (small)		Spade (big)		Small khurpi		Small khurpi-2		Twin tooth khurpa		Bill hook		Sickle (local)		Improved sickle		Grafting knife		Secateur	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Cost	1	1	3	3	2	2	2	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1
Weight	3	3	3	3	2	1	3	3	3	3	3	3	3	1	4	3	3	3	3	3	3	3
Size	3	3	3	3	2	1	3	3	2	3	3	3	3	1	4	3	3	2	3	3	3	3
Size of handle	3	3	3	3	2	1	3	3	5	3	3	3	3	1	3	3	3	2	3	3	3	3
Easiness in handling	3	3	3	3	2	1	3	3	3	3	3	3	3	1	3	3	2	2	3	3	3	3

Scale: **Cost**- 1-costly, 2-average, 3- cheap **Weight**: 1-very heavy, 2-heavy, 3-comfortable, 4-light, 5-very light

Size: 1-very big, 2-big, 3-comfortable, 4-small, 5- very small **Size of handle**-1-very long, 2-long, 3-comfortable, 4-small, 5-very small

Ease of handling- 1-very difficult, 2-difficult, 3-average, 4-comfortable, 5-very comfortable

Evaluation of harvesting tool for drudgery reduction and efficiency enhancement in fruits and vegetables

Two types of fruit harvesters were tested for the harvesting of guava. The quality of the harvested fruits was better but the speed of harvesting was decreased while using the tool. However the use of harvester helped to reduce the drudgery of climbing the tree. The basket type of fruit harvester was not found suitable for guava harvesting both by men and women (Table 19).

Table 19. Evaluation of harvesting tool for efficiency enhancement and drudgery reduction in guava

Observations	Manual		Harvester-I		Harvester-II	
	Man	Woman	Man	Woman	Man	Woman
Fruit harvested (kg/ha)	31.50	32.50	15.0	12.7	13.5	11.5
% increase in efficiency	-	-	-52.4	-60.9	-57.1	-64.6
% damaged fruits	10.5	10.5	0	0	4.5	4.0
Difficulty reported	-	-	Short blade length	Short blade length	Not suitable	Not suitable

Assessment of gender issues and identification and refinement of selected women specific technologies in horticultural crops (Network project)

The project is in operation at six Network centres viz (i) Directorate of Research on Women in Agriculture, Bhubaneswar (ii) Indian Institute of Horticultural Research, Bangalore (iii) Central Tuber Crops Research Institute, Thiruvananthapuram (iv) Central Institute of Post Harvest Engineering and Technology, Ludhiana (v) Central Institute of Subtropical Horticulture, Lucknow (vi) Central Institute of Temperate Horticulture, Mukteshwar.

Selection of villages and village profile

Ganjam

Three villages viz Burupada, Bhaliakhai and Keshpur of Hinjilicut, Bhunjnagar and Rambha blocks, respectively were selected for the survey. Survey based on the area cultivated for horticulture crops. Most of the respondents grew cauliflower whereas 83 per cent grew brinjal. Women participated in transplanting weeding, harvesting and transport of the produce from the field. Their role in decision-making was low.

Kandhamal

Three villages of Daringibadi, Baliguda and Raikia blocks of Kandhamal district were selected. The village profile of Kadasphata village of Daringbadi block was prepared and the village was surveyed for the participation of women in production and post harvest handling of horticultural crops selecting a sample of 200 households. Women participated in planting, weeding and harvesting of the horticulture crops. The role of women in the sale of the produce was low.

Indian Institute of Horticultural Research, Bangalore

Data were collected from 102 mango farmers from Padamghatta, Thaylluru, Kadumalai, Kadripura, Malnaiyaknahalli, Sayanpalli and Pallavi and 100 tomato farmers from Vaderahalli, Padamghatta and Malethaylluru villages of Kolar District. Data were also collected from 200 cabbage farmers from Kothnnur, Kuppahalli, Chadalpura, Arasanahalli, Dibburu, Gundlugurki and Hithamaknahalli from Chikkaballapur district. Data processing is in progress.

Central Institute of Temperate Horticulture, Regional Station, Mukteshwar, Nainital

Central Institute of Temperate Horticulture, Regional Station, Mukteshwar was included as a Network Centre of the Project in January, 2010. During this period the preliminary information including the profile of the state and participation of farmwomen in different horticultural activities were collected from different sources. Apple, peach, pear, plum, apricot and walnut were the main fruit crops of higher and hills. Mango, guava, litchi and papaya were the main crops of valleys and Tarai-Bhabhar zone. Potato, cole crops, cucurbits, pea, beans, tomato and capsicum were the major vegetables grown in the state. Gladiolus and marigold were the main flower crops grown. Gerbera, carnation, chrysanthemum, liliun and roses have also been introduced. As per the reports most of the culture operations in the horticultural crops were being carried out by women.

Three districts viz Tehri Garhwal, Nainital and Almora in Uttarakhand have been selected for the study. From these districts, 600 farmers and farmwomen engaged in various horticultural activities constitute the sample for study.

Central Institute of Subtropical Horticulture, Lucknow

An interview schedule was developed for collection of information on the extent of participation of women in production and post harvest activities of horticultural crops such as mango.

Two gram panchayats were selected from Mal and Malihabad subdivisions of Lucknow district which were well known for production of Dashehari variety of mango. Gulabkhera (including Gulabkhera and Kanar villages), Kanar, Au-Mau and Sultanpur were selected for examining socio-economic profile of mango farmers with special reference to role of women in mango cultivation and post harvest management. A total number of 300 respondents from 150 farm families were interviewed which included 150 men and 150 women. Farmwomen were found to be engaged in the activities such as raising of seedling rootstocks, propagation, collection of dry/pruned wood, intercultural operations, harvesting and post harvest handling, sorting and grading of fruits, cleaning, packing in wooden/CFB boxes and processing, cutting/peeling, pickling and the constraints reported by the farmer were:

- Scarcity of quality planting material of improved varieties
- Attack of insect pests such as leaf webber, mango hopper, mango mealybug, fruit fly and diseases like powdery mildew and anthracnose in mango
- Non-availability of efficient machines and tools for rejuvenation, pruning, spraying and harvesting of mango fruits

- Spurious and ineffective pesticides sold in the market
- Shortage of water and electricity during critical periods
- Strong wind storms during fruiting

The following technologies for mango developed by CISH, Lucknow were identified for testing with the women farmers:

- Integrated mealy bug management
- Integrated fruit fly management
- Induction of uniform ripening with ethrel
- Processing of raw mango fruits into mango squash (panna)
- Use of mango harvester to reduce drudgery
- Use of CFB boxes for packing
- Use of cabinet type solar de-hydrator for drying of fruits and vegetables
- Use of leaf web combing device

Central Tuber Crops Research Institute, Thiruvananthapuram

Two states viz Kerala and Tamil Nadu were selected for the study. From Kerala, Thiruvananthapuram and Kollam districts were chosen since, these two districts have the maximum area under cassava, vegetables, banana and coconut. Likewise, in Tamil Nadu, Salem district, the main cassava belt was selected for the study. Two villages namely Chenkal and Parassala from Thiruvananthapuram; Kadakkal and Chithara from Kollam in Kerala and Mallur and Panamarathupatti from Salem, Tamil Nadu were selected. With respect to the crops selected, cassava and banana were uniformly selected from all the three study districts. The third crop selected was cucurbits in Thiruvananthapuram, coconut based system in Kollam and chrysanthemum in Salem. For each of the selected crop, 100 farmers and 100 farmwomen were considered as respondents from each district, thereby making the sample size of 600 per district and the total respondents of the study was 900 farmers and 900 farmwomen.



Participation of women in cucurbits vegetables

The survey of the respondents in Thiruvananthapuram and Kollam districts of Kerala covering 600 farmers and farmwomen each was completed and the survey in Tamil Nadu was initiated. A preliminary

analysis of the information gathered from Kerala indicated that involvement of farmwomen in cassava cultivation is very negligible compared to banana or vegetables; however, in Tamil Nadu there appears to be greater participation of women in cassava farming. In banana cultivation, the extent of participation of women was observed to be highest being 75 per cent in Thiruvananthapuram district and 60 per cent in Kollam district in the activities 'retention for consumption' (Table 20). In the activities such as irrigation, fertilizer application and harvesting the participation was about 50 per cent. However, in marketing and selection and planting of intercrops, the participation was limited only to 30-35 per cent. With regard to decision making on various activities of banana cultivation, women were reported to have less than 20 per cent participation. The role of farmwomen in cucurbits cultivation was more pronounced and significant compared to banana cultivation. Over 60 per cent participation was observed in most of the activities such as irrigation, harvesting, retention for consumption and marketing. As in the case of banana, in cucurbits too, participation in decision making was restricted to less than 20 per cent. In case of coconut based system in Kollam district, participation of women in various activities were rather poor i.e. only 15-20 per cent. About 45-50 per cent participation was reported only in marketing and retention for consumption. In this system, participation in decision making was less than 25 per cent.

Use of garlic decoction, neem oil with soap solution and jaggery trap was some of the traditional methods practiced by Kerala farmers to control pests in cucurbits. In the case of banana, the traditional knowledge followed for pest control were application of lime in the pits prior to planting the suckers, dipping the suckers in FYM solution and drying them under shade.

Table 20. Participation of women (%) in cultivation of horticulture crops in Kerala

S. no.	Activity	Banana		Cucurbits Trivandrum	Coconut Kollam
		Trivandrum	Kollam		
1.	Irrigation	55	50	65	10
2.	Fertilizer application	45	50	45	15-20
3.	Selection and planting of intercrops	35	30	40	-
4.	Harvesting	50	45	70	20
5.	Retention for consumption	75	60	80	50
6.	Marketing	30	20	60	45
7.	Decision making in different activities	> 20	> 20	> 20	> 25

CIPHET, Abohar Centre

Selection of villages for survey in the identified districts viz Ramsara and Nihal Khera of Ferozepur in Punjab, Sattipura and Haripura of Hanumangarh and Sadhuwali and Kheruwala of Ganganagar in Rajasthan was completed. Major fruit crops such as aonla, kinnow, ber and vegetable crops including tomato, potato and chilies are cultivated in these districts. Collection of information on the use of horticultural tools and technology by the respondents from the selected villages is in progress.

Refinement of vegetable based organic farming practices in gender perspective

Different practices of organic farming were tested at DRWA farm for different vegetable crops.

Vegetable crops

Cow pea : Cow pea variety Gayatri was sown and different manures such as farmyard manure, neem cake and vermicompost alone and in combinations were applied as per requirement 10 days prior to seed sowing. Maximum green pods yield (8.83 t/ha) was recorded with the application of FYM @ 20 tonnes per hectare which was at par (8.295 t/ha) with the treatment FYM @ 10 tonnes per hectare + neem cake @ 1 tonnes per hectare. Maximum crop residue (8.50 t/ha) was recorded under FYM @ 20 tonnes per hectare followed by FYM @ 10 tonnes per hectare + vermicompost @ 3 tonnes per hectare. The net return (Rs 23680) and benefit cost ratio (1.50) was also highest with FYM application @ 20 tonnes per hectare. Shelf life of cow pea was studied and it was found that fruits grown with FYM treatment and packed in polythene bags recorded minimum physiological loss in weight (41.37%) after three days of storage under room temperature. Therefore, women can store cow pea in polythene bags @ 2 per cent ventilation up to three days (Table 21).



Table 21. Effect of organic manures on physiological loss of weight (%) on storage of cowpea variety Utkal Manik at ambient temperature

Treatment	Days					
	1		2		3	
	Open	Polythene	Open	Polythene	Open	Polythene
FYM (20 t/ha)	16.90	13.79	30.99	25.86	46.48	41.37
Neem cake (2 t/ha)	17.24	14.29	34.48	28.57	56.90	48.21
Vermicompost (6 t/ha)	17.86	16.07	37.50	28.57	60.71	48.21
FYM (10 t/ha)+ Neem cake(1 t/ha)	19.23	15.22	32.69	34.78	53.84	50.00
FYM (10 t/ha) + vermicompost (3 t/ha)	25.00	23.08	40.00	38.46	65.00	58.97
Neem cake (1 t/ha)+ vermicompost (8 t/ha)	18.75	20.45	34.09	31.25	61.36	56.25
FYM(6.6 t/ha)+ neem cake (0.66 t/ha)+ vermicompost (2 t/ha)	17.03	15.00	34.15	32.50	58.54	57.50
Control	19.44	14.29	33.33	25.71	58.33	42.86

Okra : The okra cv. Utkal Gaurav was sown and different organic manures were applied alone and in combinations in the soil, one week prior to seed sowing. Maximum yield (2.98 t/ha) was recorded under vermicompost @ 6 tonnes per hectare. Based on feedback collected from men and women, taste of green pods of okra as a vegetable was acceptable. As okra is a vegetable suitable for backyard cultivation and the crop yield continues for two months in winter season it is useful for home consumption and source of income for rural women.

Paddy : The paddy cv. Udayagiri was sown and different organic manures were applied separately and in combinations in the soil one week prior to seed sowing. Maximum yield (1.81 t/ha) was obtained with the application of vermicompost @ 6 tonnes per hectare (Table 22). However, this was at par (1.76 t/ha) with the treatment FYM @ 20 tonnes per hectare. The minimum yield (1.10 t/ha) was recorded in the control plant.

Table 22. Effect of organic manure on grain and straw yield of paddy variety Udayagiri

Treatment	Grain yield (t/ha)	Per cent increase in yield over control	Straw yield (t/ha)
FYM (20 t/ha)	1.76	60.27	1.11
Neem cake (2 t/ha)	1.53	39.82	1.12
Vermicompost (6 t/ha)	1.80	64.18	1.28
FYM (10 t/ha)+ Neem cake (1 t/ha)	1.53	39.82	1.03
FYM (10 t/ha) + Vermicompost (3 t/ha)	1.42	29.55	1.02
Neem cake (1 t/ha)+ Vermicompost (8 t/ha)	1.44	31.27	0.83
FYM (6.6 t/ha)+ Neem cake (0.66 t/ha)+ Vermicompost (2 t/ha)	1.60	46.00	1.00
Control	1.10	-	0.81



Pheromone traps for control of stem borer

Amaranth : Local variety of amaranth was sown on different dates to ensure vegetable availability for family consumption round-the-season. Poultry manure @ 5 tonnes per hectare + neem cake @ 1 tonnes per hectare was applied to the soil one week before seed sowing. Maximum yield (7.28 t/ha) was obtained in the crop sown in the last week of December.

Tomato : Tomato crop was raised with the application of three sources of organic manures viz farmyard manure, neem cake and vermicompost (Table 23). Maximum fruit yield (28.18 t/ha) was recorded under the application of FYM @ 20 tonnes per hectare followed by the combined application of FYM @ 10 tonnes per hectare + vermicompost @ three tonnes per hectare (24.52 t/ha). Highest net return (Rs 80100) and BCR (2.32) was obtained with the application of FYM @ 20 tonnes per hectare (Table 24). It can be concluded that application of FYM @ 20 tonnes per hectare may be more economical for tomato in Orissa conditions and can be recommended for adoption by farmwomen.

Table 23. Effect of organic manure on yield and quality of tomato variety BT-10

Treatment	Yield (t/ha)	TSS	Acidity (%)
FYM (20 t/ha)	28.18	3.98	0.39
Neem cake (2 t/ha)	20.34	4.01	0.52
Vermicompost (6 t/ha)	18.26	4.29	0.48
FYM (10 t/ha)+ Neem cake(1 t/ha)	22.94	5.01	0.61
FYM (10 t/ha) + vermicompost (3 t/ha)	24.52	3.89	0.56
Neem cake (1 t/ha)+ vermicompost (8 t/ha)	23.01	3.52	0.55
FYM (6.6 t/ha)+ neem cake (0.66 t/ha)+ vermicompost (2 t/ha)	23.87	3.75	0.54
Control	8.94	2.41	0.54

Table 24. Economic analysis (in Rs) of different organic manure treatments in tomato production

	Cost of cultivation	Gross return	Net return	B.C. ratio
FYM (20 t/ha)	60800	140900	80100	2.32
Neem cake (2 t/ha)	60800	101700	40900	1.67
Vermicompost (6 t/ha)	76800	93300	16500	1.21
FYM (10 t/ha)+ Neem cake(1 t/ha)	60800	114700	53900	1.89
FYM (10 t/ha) + Vermicompost (3 t/ha)	68800	122600	53800	1.78
Neem cake (1 t/ha)+ Vermicompost (3 t/ha)FYM(6.6 t/ha)+	68800	115075	46275	1.67
Neem cake (0.66 t/ha)+ Vermicompost (2 t/ha)	66134	119375	53241	1.81
Control	40200	44725	4525	1.11



Planting of marigold as a trap crop in tomato



Harvesting of tomato

Plant protection practices

Seedling treatment in the solution of asafoetida (*Ferula asafoetida*) and turmeric powder :

Thirty-day old seedlings of tomato variety BT-10 were treated with the solution of asafoetida @ 0.01 per cent (1 g) + turmeric powder @ 0.1 per cent (10 g) in 10 liters of water for 6-8 hours and transplanted in the well prepared field. As asafoetida and turmeric powder are easily available this treatment is found suitable for small farms.

Nursery treatment with bio fertilizer :

Raised nursery- beds were prepared for ensuring drainage to avoid damping-off and were covered with polythene sheets of 0.45 mm thickness for three weeks during June for soil solarization to reduce soil borne insects and diseases such as bacterial wilt. Three kg of FYM enriched with 250 g of *Trichoderma viride* mixed in soil in the nursery beds was beneficial for tomato seedlings. Infected seedlings were rouged out at regular intervals. Nursery raising following the above treatment can be taken up by women for income generation.

Soil treatment with bio fertilizer :

Bio fertilizer *Trichoderma viride* @ 10 kg per hectare mixed with 100 kg of FYM and applied at the time of transplanting was effective in improving the yield of tomato.

Planting marigold as trap crop for management of fruit borer *Helicoverpa armigera* in tomato:

Among eco-friendly pest management practices, planting of marigold as a trap crop around tomato protected *Helicoverpa armigera* infestation. Women can also use marigold flowers for income generation. Flower cultivation was taken up by women mainly for home consumption and worship.

Use of pheromone traps for management of borer :

Among the eco-friendly pest management practices, use of pheromone @ 10 traps per hectare was effective in mitigating borer menace in cowpea, okra, tomato and paddy. Pheromone traps are easily available, easy to handle, cost effective and a women friendly pest management practice.

Use of earthen pot trap for management of termite :

Earthen pot trap with maize cobs, after removal of grains placed in the field @ 16 per hectare was effective in termite control in paddy at early stages. Women can use earthen pot traps for management of termite in their crops as the materials used in these traps are easily available.

Application of neem cake in gunny bag through irrigation channel for management of termite in paddy :

Application of neem cake in gunny bag through irrigation channel was found effective in termite control in paddy at seedling stage. This practice was cost effective and eco-friendly and can be adopted by women. Soil fertility was also improved by this technique.

Exposure field visit of farmwomen :

Field visit of farmwomen of Mendhasal village was organized to expose them to the low cost and women friendly organic farming practices demonstrated at DRWA farm.

Data collected on preference of farmwomen for vegetable crops revealed that okra, amaranth and tomato were preferred for home consumption.

Technological empowerment of farmwomen in production of quality seeds and planting materials of vegetables

Seed of parental lines of two brinjal hybrids were multiplied which could be used for production of hybrid seed in the field of farmwomen. Skill training was imparted to farmwomen on different activities such as planting, rouging, seed extraction, drying, packing and storage. Seed production of vegetables including brinjal, chilli, tomato, bottle gourd, french bean, cluster bean and amaranths were taken up in three villages involving thirty farmwomen.

Constraints faced by farmwomen while producing vegetable seed were analyzed specific to different production system. Eight germplasm of pointed gourd were collected and maintained for multiplication both by cuttings and micro propagation. Micro propagation laboratory was set up for training to farm women and evaluating the participation therein.



Empowerment of farmwomen through information communication technology (ICT)

Data were collected from different categories of stakeholders viz subject matter specialists (SMS) of KVKs, scientists and farmwomen to determine their opinion/perceptions for prioritizing the areas of information for customization. An interview schedule was developed to identify the information needs of farmwomen in the areas of agriculture and allied fields for customization of information in women perspective. Information was collected covering six major areas i.e. farming, horticulture, livestock, livelihood options / entrepreneurship development, food and nutritional security and socio-cultural and political Issues. In each area, the information needs were assessed in three point continuum i.e. least important, somewhat important and most Important and accordingly scores of 1, 2 and 3 were assigned. The data were collected from the three groups of samples and analyzed using SPSS 17.0. The question wise mean rank between two groups was analyzed and compared through Kruskal-Wallis Test.

The information needs were identified and prioritized as per rank order. Findings indicated that different categories of stakeholders prioritized information needs differently. In farming related activities, the KVK subject matter specialists prioritized seed treatment practices for different field crops, weed management, women friendly implements for drudgery reduction in different field operations, storage practices of field crops and appropriate farming systems for different situations. The information needs prioritized by the Scientists in relation to field crops were sowing/ transplanting, manuring/fertilizer application, pest management practices, storage practices and women friendly implements for drudgery reduction in different field operations. Farmwomen prioritized their information needs such as, water management practices for field crops, different intercropping methods, organic farming, post harvest processing and manuring/fertilizer application.

Among horticulture related activities, seed selection and seed treatment and pest management practices for different vegetable crops were the important information needs as identified by both KVK SMS and Scientist whereas marketing of vegetables and fruits, value addition in fruits and vegetables, fertilizer application in fruits and vegetable crops, seed selection and seed treatment practices for different fruit crops were identified by farmwomen as a priority areas for information .

Regarding information needs in the area of animal care/husbandry, the needs prioritized by all the three categories of stakeholders were general care of cattle, calf rearing, fodder cultivation and nutrition / feed management for cattle.

Regarding entrepreneurship development/ livelihood options for farmwomen poultry rearing, goatery and sheep rearing have been identified as priority areas of information need by both KVK SMS and scientists, whereas farmwomen prioritized information needs in the areas such as bakery and confectionery production, processing and preservation of fruits and vegetable, raising herbal garden and floriculture.

Table 25. Information need prioritised as per ranked by the respondents

Activities	Rank	KVK SMS	Farmwomen	Scientists
Farming related activities	I	Seed treatment practices for different field crops	Water management practices for field crops	Sowing/ transplanting of field crops
	II	Weed management in field crops	Intercropping methods	Manuring/ fertilizer application in field crops
	III	Women friendly implements for drudgery reduction in different field operations.	Organic farming	Pest management practices for field crops
	IV	Storage practices for field crops	Post harvest processing of field crops	Storage practices for field crops
	V	Appropriate farming systems for different situations	Manuring/ fertilizer application in field crops	Women friendly implements for drudgery reduction in different field operations
Horticulture related activities	I	Bio-fertilizers and their use.	Marketing of vegetables and fruits	Bio-pesticides and their use in horticulture crops
	II	Intercropping methods /crops	Value addition of fruits and vegetables	Seed selection and seed treatment practices for vegetable crops.
	III	Seed selection and seed treatment practices for vegetable crops	Manuring/ fertilizer application in fruit crops	Pest management practices for vegetable crops
	IV	Value addition in fruits & vegetables	Manuring/ fertilizer application in vegetable crops	Pest management practices in fruit crops
	V	Pest management practices for different vegetable crops	Seed selection and seed treatment practices for different fruit crops	Water management in vegetable and fruit crops
Animal husbandry related activities	I	Nutrition/feed management for cattle	Control of diseases	Nutrition/feed management for cattle
	II	General care of cattle	Animal breeding aspects	Control of diseases
	III	Calf rearing	Fodder cultivation	General care of cattle
	IV	Fodder cultivation	Calf rearing	Calf rearing
	V	Animal breeding aspects	General care of cattle	Fodder cultivation
Livelihood / entrepreneur ship development	I	Leaf-plate preparation	Bakery and confectionery items production	Pisciculture
	II	Duckery	Agro-processing like badi, papad, masala packets, flakes, vermicelli, ready to eat items etc. preparation for commercial purpose.	Poultry rearing
	III	Poultry rearing	Fruits and vegetable preservation	Piggery
	IV	Goat & sheep rearing	Raising herbal garden	Ornamental fish production
	V	Coir/ jute work	Floriculture	goat and sheep rearing
Food and nutritional security	I	Raising kitchen/ nutrition garden	Fuel/ energy management	Water management for household purpose
	II	Water management for household purpose	Preparation of balanced/ nutritious diet for family	Raising kitchen/ nutrition garden
	III	Nutrition education	Nutrition education	Preparation of balanced/ nutritious diet for family
	IV	Fuel/ energy management	Raising kitchen/ nutrition garden	Fuel/ energy management
	V	Preparation of balanced / nutritious diet for family	Water management for household purpose	Nutrition education
Socio cultural and political Issues	I	Gender sensitization	Legal rights	Gender sensitization
	II	Legal rights	Leadership development	Leadership development
	III	Leadership development	Gender sensitization	Legal rights

Regarding food and nutritional security, both KVK SMS and Scientists identified the important information needs such as raising kitchen/ nutrition gardens, water management for household purposes and nutrition education. Farmwomen considered fuel/energy management, preparation of balanced/ nutritious diet for family, raising nutrition garden as the most important information needs. However, all the three stakeholders perceived nutrition education as an important area of information need.

Regarding socio cultural and political issues, farmwomen felt that information on their legal rights was an area of priority, whereas both KVK SMS and Scientists felt that gender sensitization is the most important information need for farmwomen.

Participatory evaluation of low cost weaning mix

Base line survey of infants selected as experimental group and control group was conducted on two aspects namely anthropometric measurements and feeding practices of infants. Anthropometric data of experimental group and control group infants were collected and compared with the national standards. It was observed that height, weight and mid upper arm circumference of the children were less than the national standards in both the groups. Infant feeding practices of the experimental group included roasted flake powder with milk or water as weaning foods.



Nutrition education and dissemination of weaning mix technology

Four training-cum-demonstrations were conducted in Jaypur village of Puri district involving mothers/farmwomen to disseminate the method of preparation of low cost weaning mix. Knowledge was also imparted on to farmwomen on infant feeding practices, hygiene and sanitation, balanced diet for infants and mothers, importance of safe drinking water, and importance of fruits and vegetables in the diet.

Impact of weaning mix on the health and nutritional status of infants

Impact of weaning mix on health and nutritional status of infants in Jaypur village of Satyavadi block is in progress.

Nutritional security as related to livelihood patterns among tribal families of Orissa

Livelihood patterns in the study area

Five major livelihood patterns viz farm based, wage based, forest based, business/service based and migration based were found prevalent in the tribal areas of Koraput and Rayagada. Each category was further grouped into primary, secondary and tertiary livelihoods. Highest percentage (49.16) was in crop based livelihood followed successively by wage based (27.48), forest based (6.67), horticulture based (5.83), migration based (5.41), service/business based (5.0), and animal husbandry based

(0.42). The secondary livelihoods included wage earning (30.83%), forest based activities (15%), crop production (13.33%) and animal husbandry (11.67%). The three most important areas of tertiary sources of income for tribal households were forest based activities (73.75%), wage earning (10%) and other activities such as masonry and carpentry (5%).

Livelihood patterns and nutritional status of children

Impact of livelihood on nutritional status of children was assessed and found that highest prevalence of malnutrition existed among the children belonging to forest based livelihood pattern. Comparison of anthropometric parameters such as weight for age, height for age and weight for height of different categories revealed that among children of said livelihood the level of malnutrition was to the tune of 94.1 per cent, 88.23 per cent and 76.47 per cent, respectively. Among the children of farming based livelihood pattern the level of malnutrition was 83.58 per cent, 83.58 per cent and 80.59 per cent. In the wage based livelihoods the extent of malnutrition was found to be 84.0 per cent, 80.0 per cent and 68.0 per cent, which was nearly at par with the children belonging to migration based livelihood pattern (80.0% and 80.59% and 68.0%, respectively).

Overall the percentage of malnutrition among selected children was found to be 77.12, 78.68, and 68.38 respectively as against the parameters of weight for age, height for age and weight for height.

Livelihood patterns and nutritional status of adolescents

The highest percentage of chronic energy deficiency (CED) was found in forest based families. The distribution of adolescent boys under CED I, CED II, CED III was recorded to be 44.44, 33.33 and 11.11 per cent respectively followed by wage based adolescent boys, 30.43, 21.73 and 13.03 per cent respectively. Next in order were migration based (25.00, 12.50 and 12.50 %) and farming based adolescents (24.44, 17.77 and 8.88%). In service/business based livelihood merely 28.57 per cent adolescent boys were under nourished and were in CED III.

The malnourishment of adolescent girls in CED I, CED II, CED III was highest in farming based livelihood (36.66, 33.33 and 3.33%, respectively) followed by wage based adolescents (30.00, 10.00 and 15.00% respectively). Though the malnutrition was more common in forest based livelihood (75%), CED II (25.00%) and CED III (50.00%) was found to be less.

In general 26.06, 18.47 and 11.95 per cent adolescent boys and 24.28, 8.57 and 17.14 per cent adolescent girls were under CED I, CED II, CED III categories, respectively.

Livelihood patterns and nutritional status of adults

The distributions of the body mass index (BMI) for distinguishing the prevalence of chronic energy deficiency (CED) among adult males and females indicated that 40 per cent males and 57.09 per cent females were in the CED category in the selected area. The lowest percentage of CED (25% males and 41.7% female) was in service / business based livelihood pattern. In farming based livelihood pattern 39 per cent males and 53 per cent females were in CED category. CED grade III was highest in forest based livelihood pattern (25% males and 43.75% females).

On the whole 13.33, 16.66 and 8.335 per cent males and 20.83, 20.83 and 13.75 per cent females were in CED I, CED II, CED III categories respectively.

Inter generational changes in the livelihood patterns of the tribes

Analysis of inter-generational change in the livelihood patterns revealed that there was a drastic reduction in the forest based livelihood as primary (37.10%) and secondary (22.50%) sources of income as compared to present generation livelihood. There was a marginal increase in the wage based livelihood pattern both as a primary (14.60%) and secondary (15.0%) sources of income from past to present generation. Marginal increase was also observed in the crop production, horticulture, service/small business and migration as a primary source of income (5-6%). This increase was mainly due to the government support to agriculture and horticulture, communication and credit facility for small business and education to enable employment as well as migration. There was a decrease (23.80%) in crop production as a secondary source of income in the tribal livelihood patterns. This might be due to the shifting of traditional agriculture towards more cash crops, horticulture and animal husbandry.

Progress of work at Sub-centre

Ergonomical interventions in developing hand operated maize dehusker-sheller for farmwomen

Dehusking and shelling of maize cob is mostly performed by farm women. During the development of the prototype of hand operated maize dehusker-sheller, it was kept in mind that the equipment suitable for farmwomen would automatically suit to men workers as anthropometric, strength and aerobic capacity of men workers are better than women. The hand operated equipment is preferred by farmwomen as they wear loose cloths and are not accustomed with cycling. Equipment suitable for hand operation might work efficiently with 1 or 0.5 hp electric motor as human could develop a power of 1 hp.

The power consumption in dehusking-shelling the maize cob with commercially available power operated maize dehusker-sheller was estimated at 76 W. The farmwomen could produce 18.3 N-m at average hand cranking speed of 50 rpm. Thus 95.82 W power was obtained.

Hence to develop the dehusker-sheller, maximum power obtainable from subject (farmwomen) was taken as 100 W. Assuming a power loss of five per cent due to power transmission through chain-sprocket and 10 per cent loss in stepping-up the speed, thus, the net power would be 85 per cent of maximum available power from subject which could be utilized for operating the maize dehusker-sheller.

Of ergonomic considerations, anthropometric data of Madhya Pradesh farmwomen, isometric torque developed by the subject at different position of handle and hand cranking speed at constant frictional load were considered. The lowest isometric torque obtained at shortest crank length (17.5 cm) in sitting posture was considered so that subject having body weight of even less than 40 kg could also operate

the machine. Hence, 30 per cent of torque (14.82 N-m) obtained at crank length of 17.5 cm during front side was taken as the criteria for developing the prototype of hand operated maize dehusker-sheller to be operated by farmwomen. The crank length of about 27 cm would be the optimum to develop better torque at all positions of handle. The declination of the isotonic torque at constant load after hand cranking speed of 55 rpm in sitting postures was noticed. Thus, hand cranking speed upto 55 rpm for dynamic work (hand cranking) was considered and accordingly power transmission system was developed.

Of mechanical considerations, axial flow threshing system was opted and the threshing cylinder consisted of beaters, solid lugs and louvers. The diameter of cylinder including lugs height was kept 380 mm to achieve the peripheral tip speed of cylinder of about 5.5 m/s at hand cranking speed of 50 to 55 rpm with the machine. A chain and sprocket was selected for transferring power from subject to threshing cylinder that consisted of frame for mounting drive sprocket, shaft for mounting drive sprocket and handle. Maize dehusker-sheller having cylinder length of 725 mm was developed. farmwomen operated the equipment but they were not so comfortable. Hence torque was measured at idle and load (feed rate of 100 kg/h) condition at cylinder speed of about 5.6 m/s. The average torque was 3.59 N-m which varied from 2 to 7 N-m. Thereafter cylinder was redesigned for 540 mm cylinder length and fitted in the prototype. This prototype was successfully operated by farmwomen with the intended function of the dehusking-shelling of maize cob.

The optimum peripheral cylinder tip speed of 5 to 5.6 m/s was obtained while operating the maize dehusker-sheller with electric motor. The dehusking efficiency, shelling efficiency and grain breakage were 99, 98 and less than 1 per cent respectively for feed rate of 80 to 100 per hectare and moisture content of 14.53 per cent (d.b).

Ergonomical evaluation

The hand operated maize dehusker-sheller was ergonomically evaluated with ten farmwomen in standing and sitting postures. The data in brief are given in Table 26. The hand operated maize dehusker-sheller was found to reduce the physiological cost by 38.95 and 21.62 per cent in dehusking and shelling the maize cob with hand, and dehusking by hand and shelling with octagonal shaped hand maize sheller respectively.



Farmwomen operating the prototype with modified cylinder in standing posture



Farmwomen operating the prototype with modified cylinder in sitting posture

Table 26. Ergonomic evaluation of hand operated maize dehusker-sheller with modified cylinder in standing and sitting mode of hand cranking.

Parameters	Average values	
	Standing	Sitting
Age of subject, years	33.1 ± 5.6	33.1 ± 5.6
Body weight of subject, kg	43.3 ± 3.9	43.6 ± 4.1
Stature of subject	151.4 ± 5.6	152.0 ± 5.05
Number of left hander subject	1	1
Number of right hander subject	9	9
Experience of subject in farming, yrs	8.3	8.5
Grip force, N		
Right hand	237.01 ± 40.82	228.87 ± 36.93
Left hand	188.55 ± 24.90	186.88 ± 33.47
Working environment		
Dry bulb temperature, °C	24.2 ± 1.65	24.3 ± 2.9
Relative humidity, %	41.9 ± 11.1	38.2 ± 11.1
Handle height from ground, mm	610	610
Handle length, mm	260	
Weight of un-dehusked cob/ subject (kg)	15	
Grain moisture content, % (w.b)	13.71 ± 0.42	
Number of cob to be fed/ subject	88 ± 7	91 ± 8
Hand cranking speed, rpm	56 ± 3	54 ± 3
Torque required in operation of prototype at cylinder shaft rpm of 280, N-m Idle	1.48 ± 0.51	
During feeding rate of 100 kg/h	3.0 ± 1.01	
Output, kg/h		
Cob	83.6 ± 9.9	83.0 ± 13.3
Grain	60.3 ± 8.2	57.6 ± 9.8
Dehusking efficiency, %	100	99.5
Shelling efficiency, %		
Cob	97.95 ± 0.85	96.85 ± 0.71
Grain	60.33 ± 8.23	97.16 ± 0.68
Grain breakage, %	0.82 ± 0.42	0.75 ± 0.46
Heart rate during work, beats/min	144	142
Work pulse, beats/min	62	57
Estimated energy expenditure, kJ/min	20.1	19.58

Progress on new initiative of research at Sub-centre

A project on occupational health hazards of farm women at their work place in Bhopal district was initiated. For preliminary work a questionnaire was developed for survey of farmwomen workers working at farm in Bhopal. Data was collected from samples of fifty women labourers to assess their perception and reaction towards occupation and development. Among them, 54 per cent of the respondents were of the age group of 20-30 years followed by 38 per cent in age group of 31- 40 years and 8 per cent of above 41 years. The literacy rate was about 94 per cent.

EXTERNALLY FUNDED PROJECTS**Economic up-liftment of rural women through integrated fish farming (Department of Biotechnology)**

Economic upliftment of rural women through integrated fish farming was successfully completed. The project was implemented in three blocks of Puri and Cuttack districts of Orissa and covering a total 300 beneficiaries and about 6.0 ha water area. As per the target of the project women SHGs were selected

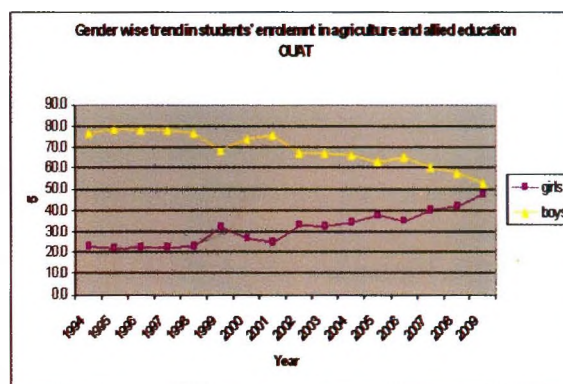
and along with scientific carp culture fish-cum-duck and fish-cum-poultry were introduced. It was found that in fish-cum-poultry integration, the integration practices were not strictly followed and was taken up as a backyard activity. Fish-cum-duck integration was very successful in terms of technology adoption, pond management and economic gain. It was found that the prescribed 300 to 400 birds per hectare were not suitable for rural women. Hundred birds per hectare was found to be well manageable by the group. The project activities were helpful in strengthening the women SHGs and encouraged other SHGs to take up aquaculture in available water bodies.



Visioning, Policy Analysis & Gender (National Agricultural Innovation Project)

Trend in students' enrolment in agricultural education

A study was initiated under V-PAGE, a sub-project of NAIP, to understand the trend of enrolment of boys and girls into agricultural education with the objective of assessing gender wise trend of enrolment and the changing scenario. To begin with, Orissa University of Agriculture and Technology (OUAT), Bhubaneswar, was taken as a case. The study based on 15 year of longitudinal gender disaggregated data on students' enrolment into courses such as B.Sc (Ag), B.V.Sc., B.F.Sc. and B.Sc (Forestry) indicated that share of boys in overall enrolment has declined over years from about 78 per cent in 1994 to about 50 per cent in 2009.



OUAT presented a scenario characterized by gender equality in students' enrolment into agricultural courses. However, the scenario was different across courses. In 2009, girls had much higher enrolment in B.Sc (Ag) courses. Girls constituted about 61 per cent of total student enrolment as against 39 per cent by boys. But in other courses such as B.V.Sc., B.Sc (Ag.Tech), B.F.Sc and B.Sc.(Forestry), girls constituted 37.3 per cent, 45.5 per cent, 31.3 per cent and 25 per cent of total students enrolment respectively which was high but lesser than that of boys.

CONSULTANCY

A consultancy on Evaluation of STEP project on Integrated Fisher women training on improvisation of dry fish products was completed. The study was sponsored by the Ministry of Women and Child Development, Govt. of India, with the objectives of assessing the technological and institutional changes in area of dry fish production and impact of the project on socio-economic status of beneficiaries. Four coastal districts of Orissa, i.e. Balasore, Bhadrak, Puri and Ganjam were surveyed to collect responses from beneficiaries on different parameters such as knowledge and skill improvement, extent of adoption, production of dry fish, constraints in adoption, continuing practices in the area of dry fish production and other changes that have had bearing on prospects of dry fish production and adoption of improved method of dry fish production. Based on the results from the study final report was prepared and submitted to the Ministry.

ALL INDIA COORDINATED RESEARCH PROJECT ON HOME SCIENCE

The All India Coordinated Research Project (AICRP) on Home Science is in operation at nine State Agricultural Universities. The technical plan of action of the project during XI plan period focuses on development of gender specific database and training modules for farmwomen, technology interventions for drudgery reduction in agriculture, nutritional security and health promotion of farm families, promoting vocational skills among adolescent girls, value addition to under-utilized natural fibre resources and empowerment of rural women for livelihood security. The total budget outlay for the year 2009-10 is Rs 645.7 lakhs. The salient achievements made during the year 2009-10 under the project have been summarized below:

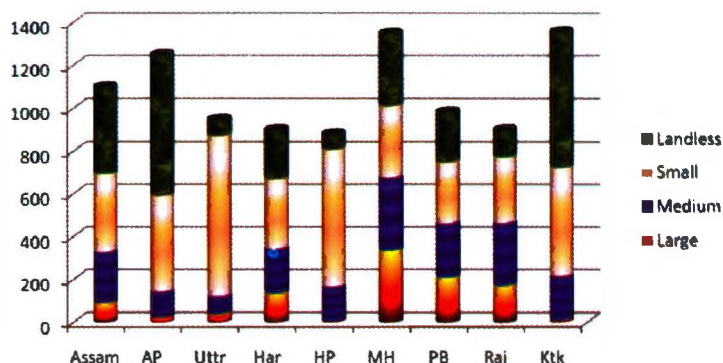
Gender specific data base of farm families

The data were collected from 9673 households in nine states covering 55 agro-climatic zones. The data were collected from both female and male head of a household. The sample was selected using stratified proportionate random sampling method, thereby covering 2764 landless, 3997 small, 1873 medium and 1039 large landholding category families from nine states. The data included the roles and responsibilities of men and women and their access to and control over resources in various aspects of the farm and home. The details of families selected from the nine states are presented in Table 27 and Figure 4.

Table 27. State-wise distribution of sample selected from different landholding categories

State	Large	Medium	Small	Landless	Total
Assam	93	235	367	405	1100
Andhra Pradesh	26	116	451	657	1250
Uttarakhand	42	78	755	75	950
Haryana	138	204	329	229	900
Himachal Pradesh	7	159	645	70	881
Maharastra	337	338	338	337	1350
Punjab	211	250	290	233	984
Rajasthan	174	289	312	125	900
Karnataka	11	204	510	633	1358
Total	1039	1873	3997	2764	9673

Figure 4. State-wise distribution of households from different landholding categories

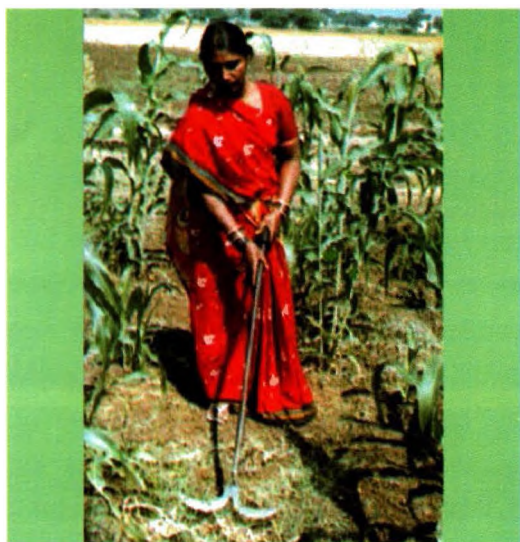


Development of gender specific extension methodologies and training modules

Each Centre adopted five villages and the activities such as village mapping, transect walk, time line and venn diagram were carried out. Disadvantaged women groups according to socio-cultural variables were identified by each Centre for their needs assessment. Each of the nine Centers identified one topic for development of a training module. The training module consisted of trainers guide, interactive CD etc. for capacity building of women groups. Trainings were organized for skill development and enhancement of knowledge of rural women in adopted villages to improve their livelihood security.

Technology intervention for drudgery reduction in agriculture

Twenty three technologies such as improved khurpi, improved spreading tool, finger guards, improved hand weeder, paddy row seeder, improved sickle, wheel hoe, cotton picking bag, capron, gloves, improved cap, clod breaker, manual paddy thresher, hand rake, gopal khore, groundnut decorticator, falcon sickle, vegetable plucker, maize-sheller, improved ring cutter, saral khurpi and trishul weeder were validated in all nine Centers. Interventions trainings were organized for awareness, knowledge and skill development. Impact of the technologies was assessed through pre & post tests. Significant gain was reported by all the Centers on awareness and knowledge of technologies introduced among farm families. Some of the technologies adopted by more than 50 per cent of families are improved sickle, improved khurpi, maize sheller and vegetable plucker, whereas cotton picking bag, ground nut decorticator, hand rake, improved cap, ring cutter, trishul weeder were adopted by 30 to 50 per cent of women/ families.



Trishul weeder



Wheel hoe

A trainers' training module on drudgery reducing technology intervention for women in agriculture was developed. The module were translated into nine regional languages. The module was tested on 113 subject matter specialists for its effectiveness. The module was found effective with an observed mean score of 16.81 over all variables against a maximum score of 18 and 83 per cent of subjects were found with in the Mean and SD. This confirmed that the module can be treated as effective.

For promoting entrepreneurial development among women and for their livelihood security, following technology interventions were conducted at each Center on the identified drudgery prone activities. (Table 28) :

Table 28. Technology interventions on rural enterprises

Centre	Potential activity for enterprise development	Drudgery identified	Technology evaluated
AAU, Johat	Food processing	Pounding of rice	Dhenki with adjustable rope
ANGRAU, Hyderabad	Leafy vegetable harvesting and bunching	Vegetable bunching	Use of elastic bands in bunching
CCSHAU, Hisar	Bead making	Bead string making	Rotary oscillating disk
CSKHPKV, Palampur	Bamboo craft	Bamboo strip smoothening	Bamboo strip smoothening tool
GBPUA&T, Pantnagar	Quilt making	Checking, mending and packaging	Spreader frame and low level chair, thimble
MAU, Parbhani	Dairy	Milking	Milking stand and stool
MPUA&T, Udaipur	Gur making	Gur processing	Improved accessories for stirring gur
PAU, Ludhiana	Vegetable growing	Vegetable plucking	Improved ring cutter
UAS, Dharwad	Chilli powder enterprise	Chilli pounding	-

Capacity building trainings on fuel, alternative energy, water sanitation and income management practices were conducted for farmwomen. The fuel saving technologies such as improved chulha, rice husk stove and portable chulha / priyagni stove, biogas plant, steam cooker, pressure cooker, electric shegadi and LPG stove were demonstrated. For water conservation, technologies such as sand filter, drip irrigation, solar distillation technique, chlorination, filtering, cleaning water tanks, water purifiers, rain water harvesting etc were demonstrated. Women were also made aware about alternate source of energy/ technologies such as solar lights, lanterns, fans, torch, cooker, water heater, indigenous solar dryer, fiber brick and labour saving technologies such as kitchen accessories useful in food preparation and processing.

Nutritional security and health promotion of farm families

To facilitate the intake of nutritive diet among farm families, a total of 511 nutrition gardens were promoted in the adopted villages in kharif season (270) and rabi season (241). For this purpose, seed

and planting materials of different vegetables and fruits were distributed to the farm families. Other inputs including vermicompost, neem oil, neem cake were also supplied to the families as per their needs. In the nutrition garden green leafy vegetables such as spinach, mustard leaves, coriander, radish leaves, fenugreek leaves, amaranthus and other vegetables like french bean, cow pea, brinjal, knol khol, papaya, pumpkin, cabbage, cauliflower, tomato, bottle gourd, bitter gourd, ridge gourd and tuber crops such as carrot, onion potato, garlic, turnip and radish were grown. Besides these, fruit crops namely lemon, papaya, guava and pomegranate were also grown. All the produces from the nutrition garden were utilized by the farm families for their household consumption and remaining produce were sold in the market for livelihood.

Nutrition education was also imparted and awareness was created among 3170 farmwomen and adolescent girls through various information, education and communication (IEC) programmes in the adopted villages in the areas of general health and nutrition, personal hygiene and sanitation, balance diet, nutritional requirement of various age groups, value added products for better nutrition and low cost nutritious recipes from locally available foods.

For promoting food based enterprises for livelihood security 40 training programmes were conducted benefitting 1300 farmwomen and adolescent girls in the areas of food preparation, processing and preservation, drying fruits and vegetables, pickles, chutneys and squashes making, value added products from locally available foods.

To address the problem of anemia, each Centre developed an iron rich product named as *lehyam* by using under utilized green leafy vegetables. Altogether 24 *lehyams*/ formulations were developed. The standardization, nutrient analysis, quality control, sensory evaluation and shelf life studies were carried out. The overall acceptability score of organoleptic characteristic of *lehyams* ranged from 5.0 to 8.65 based on 9 point hedonic scale. The iron content of the *lehyam* ranged from 8.53- 37.59mg/100g. Most of the Centres had achieved the targeted iron content between 3-5 mg/ 20 g of servings of *lehyam*/formulations. Formulations also had good nutritional profile in terms of calcium, vitamin C and β carotene.

Promoting vocational skills among adolescent girls

A total sample of 1351 adolescent girls and young women in the age group of 11-25 years were selected by all the nine Centers for promotion of vocational skills among them. At each Centre 20-40 young mothers and adolescent girls participated in each programme. About 41 per cent girls were in the 12- 15 age group and 22.8 per cent were in the age group of >18 years. Their needs were identified and skill trainings were imparted in the area of home science and agriculture such as vermicompost preparation, creche management, preparation of educational play materials, soft toy making, food preservation, preparation of utility items, embroidery and infant garment construction (Table 29).

Table 29. Skill development trainings organized by different Centres

S. no	AICRP Centre	Trainings imparted areas	No of training
1.	ANGRAU, Hyderabad	Sweets and confectionaries and masala powder making	1 1
2.	AAU, Jorhat	Establishment of early childhood care and development Centres Preparation of play materials	2 2
3.	CCSHAU, Hisar	Creche management Preparation of teaching material and soft toys	2 2
4.	GBPUA & T, Pantnagar	Paper flower making Preparation of file folders Preparation of paper bags	2 3 3
5.	MAU, Parbhani	Infant clothing construction- paper cutting, selection of cloth, cloth measurement and cutting, developing marketing skills and market linkages Vermicompost	4 4
6.	MPUA & T, Udaipur	Creche management Vermicompost Preparation of play material for children Food preservation	3 2 2 3
7.	PAU, Ludhiana	Soft toy making Embroidery, stain removal, dupatta dying Preparation of nutritious snacks and sweets	2 3 3
8.	CSKHPKV, Palampur	Soft toy making Artificial fruits making	3 2
9.	UAS, Dharwad	Tailoring, embroidery, soft toys making Tie and dye	2 2

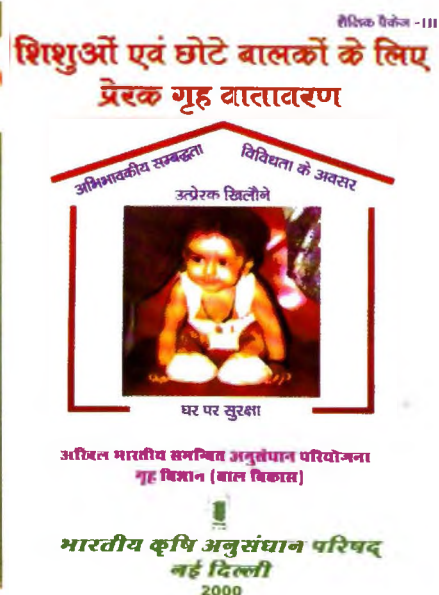
Development of training module for farmwomen for care and management of children

A training module on care and management of children was developed by each Centre for the use of rural young mothers. Each Centre selected 30-35 children (age group of 3-5 years) from the Anganwadi Centre of their adopted villages. Growth monitoring, supplementary nutrition, immunization and health check up were some of the important parameters used for development of the module. Anganwadi workers and mothers of these children were imparted trainings on child care, development of educational play materials, health and nutrition.



Skill development among children

To impart training on infant stimulation AAU Jorhat Centre developed and published an infant stimulation package consisting of items needed for various modalities for infant stimulation namely visual, auditory, tactile and kinesthetic. The package contained a manual for administering the package and also the checklist for measuring the developmental milestones of infants from birth to two years. The objective was to provide multi-sensory stimulation to infants from birth to two years.



Development of life skill education module for adolescent girls

To empower the adolescent girls and young women in different social aspects through life skill education, a module was developed which included ten life skills namely decision making, interpersonal relations, communication skills, self-esteem, critical thinking, creative thinking, problem solving, empathy, stress management and dealing with emotions.

Value addition to under-utilized natural fibre resources for enterprise development

All the nine Centres selected different underutilized locally available fibres to produce value added products. According to the nature and quality characteristics of the fibre, different woven and non-woven products were made namely garments, table mats, doormat, toran, basket, files, purse, bags, asanas, kambal, cap, mobile pouch, tufted balls etc. The types of underutilized fibers and products developed from these fibers are given in Table 30.

Table 30. Types of underutilized fibers and products developed

S. no.	AICRP Centre	Source of fibre	Process/ techniques used	Product made
1.	Dharwad	Deccani wool	Wool shearing, carding, spinning, weaving and felting	Weaving- asanas, kambal, bag non-woven-cap, mobile pouch and tufted balls
2.	Hisar	Cots wool and khadi silk	Weaving	Designers kurtis
3.	Hyderabad	Sisal	Fibre extraction, crochet and knitting	Non-woven-hand made papers, paper bag, table mat, phone mat, doormat, toran, basket, files and wall panel
4.	Ludhiana	Sun hemp	Weaving	Weaving-mat and coasters
5.	Palampur	Buil (<i>Grewia optiva</i>)	Fibre extraction, weaving, braiding and sheet making	Weaving-fabric Non woven-hand bag, purse, table mats and caps
6.	Pantnagar	Hemp Indian stinging nettle (<i>Girardinia heterophylla</i>)	Fibre extraction and weaving	Weaving-purse, cushion cover, belt and head band
7.	Parbhani	Banana	Fibre extraction, crochet and braiding	Non-woven-table mat and wall panels
8.	Udaipur	Ambadi, Sun hemp and Bhindi	Fibre extraction, spinning, knitting, crochet and braiding	Non-woven- asanas, footmat, magazine holder, cut pile rugs, telephone mats, rakhees and multi-purpose holder



Value added textile products from agro-based fibres

Each Centre took up the activities including hand made paper products, fancy bags, durries, household textiles and embroidered products (Table 31).

Table 31. Micro enterprises for income generation

S. no	AICRP Centre	Enterprise	Product made	Net profit (Rs / month)
1.	Dharwad	Karnataka kasuti	Wall panels, pouches, ghagra, choli and sarees	2000-2200
		Garment designing and construction	Blouse, toppers, salwar, kameez, purse and bag	1800-2000
2.	Hyderabad	Hand made paper products	Carry bags, folders, lampshades, jewellery boxes, nut and sweet boxes	4000-4500
3.	Parbhani	Fancy cloth bag making	Decorative cloth bags	1500-1800
4.	Udaipur	Durrie/mat weaving Home Textiles	Asanas, mat and durries table and cushion covers	25-30 (per piece)

A total of eighteen training modules were prepared (two per Centre) in English and in the regional language in the areas of garment designing and construction, care of clothing, clothing practices, stain removal at household level, knitting, rug making, macrame techniques, natural dyeing of wool, tie and dye with natural dyes, block printing with natural dyes, renovation techniques of clothing and entrepreneurship on sisal fibre. Few Centers tested the efficacy of the training modules and found that the modules were easily comprehended by the subjects due to simplicity of presentation and relevance of the techniques.



Training module

Utilization of degradable and non – degradable farm waste

Natural degradable fibres viz banana, jute, sisal, pineapple etc which are thrown as farm waste were utilized to produce eco-friendly products which have great demand. The degradable farm wastes obtained from agro-based resources were utilized for making value added textile products. (Table 32).

Table 32. Products developed from degradable farm waste

S. no.	AICRP Centre	Fibre utilized	Process/technique used	Product developed
1.	Assam	Waste of banana fibre	Crocheting	Folder, note book and visiting card
2.	Dharwad	Banana and jute fibre	Crocheting	Bags, phone mats footmats and runners
3.	Hyderabad	Handmade paper	Paper cutting and pasting	Tea bags, carry bags files, covers and greeting cards
4.	Pantnagar	Handmade paper, news papers, cotton cloth and old news papers	Paper cutting and pasting, arrangement of dried flowers, leaves and ribbons rolling of papers and sticking and clay work for value addition	Envelopes, bookmarks, gift boxes, greeting cards, diaries, pen holders and photo frames
5.	Udaipur	Hand made paper	Paper cutting and pasting	Toran, multi-purpose holders, folders, photo frame and envelopes

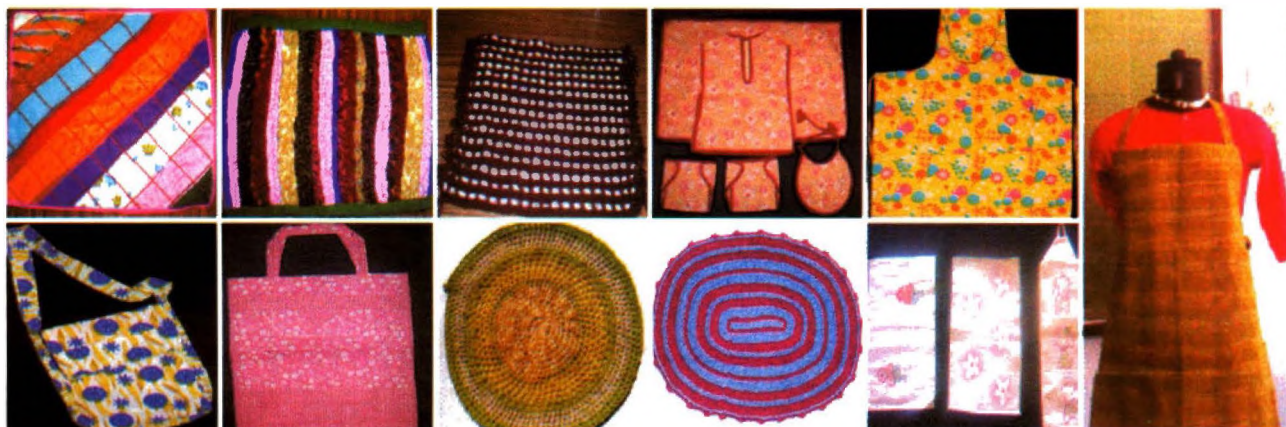


Hand made paper and paper products

Different type of products such as folders, hand bags, rain coat, kids wear, bonded diapers, bibs and baby sheets, refrigerator covers, table mats, apron, babyhood, gloves and mattress using non-degradable waste such as polythene bags, nylon sarees and waste fabric of dress materials were developed (Table 33).

Table 33. Products developed from non-degradable waste

S. no.	AICRP Centre	Fibre utilized	Process/technique used	Product developed
1.	Assam	Jute and Polythene	Bonding (pressing with hot iron)	Folder and bag
2.	Dharwad	Polythene bags	Crocheting brown paper cutting and pasting	Phone mats, cloth and envelopes
		Old sarees / dupattas	Crocheting	Runners and phone mats
3.	Hyderabad	Polythene resin and sisal fibre	Composite making	Fibre sheet
4.	Ludhiana	Polythene sheets	Sandwiching and stitching	Waterproof garments such as bib, apron, hood, mattress, gloves, raincoat and bag
5.	Palampur	Polythene bags	Thermal bonding	Bibs, baby sheets, diapers, refrigerator cover, apron, rain coat and table mats
6.	Pantnagar	Waste synthetic yarns Waste fabric of dress material	Needle point stitches (cut pile and cross stitch) stitching and patch work - machine stitching with anchor thread and applique work - stitching - braiding and stitching - knitting and interlacement - stitching and sticking	Wall panel Cushion cover Telephone mat Pouch Rug Asana Photo frame
7.	Parbhani	Fertilizer polythene bag waste	Sandwiching and stitching	Book holder, folders, baby feeder, baby sheets, table mat set, apron and bags
8.	Udaipur	Polythene bags and unused clothes	Thermal bonding	Folders, baby feeder, bibs, baby sheets, fridge cover, apron and bags



Value added products from non-degradable waste

Empowerment of rural women

A total of 53 skill development training programmes were organized at 45 adopted villages to train 600 adolescent girls and farmwomen in making consumer products using natural dye sources viz natural dyeing, printing, tie-dye, embroidery, garment construction and designing, surface enrichment, fibre handicrafts and house hold utility products, value added hand made paper products, soft toy making and herbal gulal making for economic empowerment.



Fabric printed with natural dyes

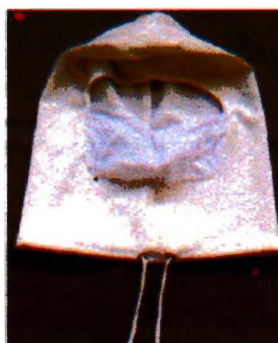
For combating occupational health hazards during pesticide application protective clothing items were developed for both male and female pesticide applicators. For males, cap with mask, hood with mask and upper garments viz kurta and pyjama, jacket with cap and pyjama (water proof) and for females scarf with mask, hood mask and beak mask.

Use of protective gear reduces exposure and thus reduces risks from the pesticides. Hence, an attempt was made to assess the fabric barrier properties against pesticide to develop suitable protective clothing for farm families. All the nine Centres selected local crops for pesticide residue analysis and estimated the fabric barrier properties of pesticide residues (Table 34).

Upper garments



Hood mask



Scarf with mask



Protective clothing for male and female

Table 34. Pesticides residue analysis

S. no.	AICRP Centre	Crop	Pesticide	Fabric blend	Tolerance level (0.02 ng/cin ²)	
					Above	Below
1.	Assam	Tea	Malathion	60:40 Poly and cot 100% cotton	100% cotton 0.363	60:40 P/C 0.003
2.	Dharwad	Cotton	Triazophos	33:67 Poly and cot 45:55 Poly and cot	-	33:67 P/C 0.005 45:55 P/C 0.009
3.	Hisar	Mustard	Cypermethrin	50:50 Poly and cot 100% cotton	100% cotton 3.729 50:50 P/C 10.124	-
4.	Hyderabad	Grape	Dimethoate	3 3:67 Poly and cot 45:55 Poly and cot	33:67 P/C 0.592	50:50 P/C 0.001
5.	Ludhiana	Bhendi/ okra	Fenvalerate	60:40 Poly and cot 100% Cotton	60:40P/C 0.150 100% cotton 0.145	-
6.	Palampur	Apple	Mancozeb	33:67 Poly and cot 50:50 Poly and cot	33:67 P/C 2.649 50:50 P/C 1.716	-
7.	Pantnagar	Paddy	Chloropyrifos	100% cotton 60:40 Poly and cot	60:40 P/C 1.15 100% cotton 1.13	-
8.	Parbhani	Soya	Monocrotophos	100% cotton 60:40 Poly and cot	-	60:40 P/C 0.001 100% cotton 0.0004
9.	Udaipur	Maize	Pegasus (Difenthiuron)	67:33 Poly/Cot 60:40 Poly/cot	67:33P/C 0.067	60:40 P/C 0.008

Irrespective of P/C blends, Malathion for tea (0.003), Dimethoate for grape (0.001), Monocrotophos for soya (0.001 and 0.0004), Pegasus for maize (0.008) and Triazophos for cotton (0.005 and 0.009) showed below the level of tolerance. This indicated that this pesticide may be safely used by pesticide applicators. However safe clothes can reduce the risk of health hazards. □

AICRP - KVK Interface

To disseminate the information and technologies tested and generated under the project interface meetings with KVK SMS were organized under the project. Seven Centres namely ANGRAU, Hyderabad; MAU, Parbhani; GBPUA&T, Pantnagar; CCSHAU, Hissar; AAU, Jorhat; CSKHPKV, Palampur and MPUA & T, Udaipur have conducted a two days interface meeting with KVK programme coordinators and subject matter specialist for dissemination of technologies developed under AICRP on Home Science to the farming communities. The different thematic areas such as value addition to natural dyes for income generation, effectiveness of trainers training module on drudgery reducing technology, women friendly improved tools/ implements for drudgery reduction in farm and home activities, value added supplementary foods for nutrition security, empowering rural girls with life skills, training need assessment and PRA tools were discussed.



Milking using revolving milking stand and milking stool

Awareness was generated among the participants about 23 women friendly improved tools/technologies developed and tested by AICRP, Family Resource Management unit, for drudgery reduction in home and farm activities. The agricultural implements such as cotton picking apron, trishul weeder, gopal khore, revolving milking stand, revolving milking stool, cotton stalk puller, stubble collector, paddy row seeder, finger guards, head load manager, water trolley, water fetching bag, naveen sickle, dung collector etc. were demonstrated. Participants were also sensitized about the importance of the training modules. For nutritional awareness, participants were encouraged to prepare the supplementary foods for different vulnerable groups such as ragi poori, soya poha laddu and ragi biscuit

for preschool children, bajra mathri, sandwich and sago biscuit for school going children, cauliflower dhapata, drumstick chutney and burfi for pregnant women and dal chiwada, poori mix and paratha mix for lactating women. The participants were also trained in various steps in the preparation of banana flour, papaya powder, green leafy powder by different drying methods.

Various need based vocational skills were imparted to adolescents and young women for income generation, comprehensive child care through farm creche, social and educational motivation to improve mental health, physical health and reproductive health etc. The participants prepared various modules on farm trials focusing the technologies developed under AICRP on Home Science which could fulfill the needs of the farmwomen for enhancing the quality of life. An exhibition was organized at each Centre with different materials developed under AICRP on Home Science and the training materials such as booklets, folders, leaflets of various technologies developed under the project was distributed to the participants.



Display arranged during the Interface

IMPORTANT MEETINGS

Institute Research Committee (IRC)

The seventh and eighth Institute Research Council meeting of Directorate Research on Women in Agriculture was held on 30 April, 2009 and 24 December, 2009 respectively. The following members attended the meeting. Presentations of the research projects were made by Principal Investigators and suggestions given by the IRC.

Dr Krishna Srinath, Director	-	Chairperson
Dr A.K. Mehta, Assistant Director General	-	Member-ICAR
Dr M. Srinath, Principal Scientist	-	Member
Dr M.P.S. Arya, Principal Scientist	-	Member
Dr Suman Agrawal, Principal Scientist	-	Member
Dr A.K. Misra, Principal Scientist	-	Member
Dr P.C. Tripathi, Principal Scientist	-	Member
Dr S.K. Srivastava, Senior Scientist	-	Member
Dr S.P. Singh, Senior Scientist	-	Member
Dr Sabita Mishra, Senior Scientist	-	Member
Dr P.K. Sahoo, Senior Scientist	-	Member
Dr Naresh Babu, Senior Scientist	-	Member
Dr H.K. Dash, Senior Scientist	-	Member
Mrs L.P. Sahoo, Scientist (SS)	-	Member
Mrs Abha Singh, Scientist (SS)	-	Member
Dr B.N. Sadangi, Principal Scientist	-	Member-Secretary

Rajbhasha implementation

Rajbhasha Hindi meetings and workshops were organized regularly during the year. Different Hindi programmes were organized during Hindi Chetna Mas which included workshops, competitions in essay writing and translation.



Media meet

A Media meet to highlight the activities and achievements of DRWA was organized by the Directorate of Publication & Information (DIPA), ICAR, New Delhi on 5 January, 2010. Representatives from electronic and print media attended the meet. Dr Krishna Srinath, Director, DRWA, Dr T.P. Trivedi, Director, DIPA and Shri Anil Sharma, CPRO, ICAR, New Delhi addressed the media. A display of women friendly technologies developed by DRWA under the research projects and the All India Coordinated Research Project on Home Science and a field visit was arranged on the occasion. Media gave a good coverage of the meet in television channels and newspapers.



Women in Agriculture Day

Women in Agriculture Day was observed on 4 December, 2009. A two-day National Seminar on Women in Agriculture was also held from 4-5 December, 2009. An exhibition was arranged on the occasion for awareness generation among farmwomen on improved agriculture tools /implements and technologies. About 150 farmwomen from nearby villages visited the exhibition and participated in discussions.



International Women's Day

International Women's Day was celebrated on 8 March, 2010. A meeting organized in this connection under the chairmanship of the Director, DRWA in which scientists of DRWA and CIFT Cochin participated and exchanged their views on the subject.

TRANSFER OF TECHNOLOGY

Programme	Nature of participation
Women friendly technologies on the farm and major consideration for development of tools and equipment for women organized by CIAE, Bhopal on 21 September, 2009	Technical lecture
Advances in grain processing technology and its value addition organized by Indian Institute of Crop Processing at Bhubaneswar on 4 October, 2009	Technical lecture
National Conference of KVKs held at TNAU, Coimbatore on 6 - 8 November, 2009.	Exhibition
Gender friendly technologies in agriculture management organized by Central farm Machinery Training and Testing Institute, Budni (MP) on 13 November, 2009	Technical lecture
Training course on 'Operation and maintenance of Modern Farm Implements on hiring' under ATMA, organised by KVK, CIAE, Bhopal on 18 December, 2009	Technical lecture
Training course on Operation and maintenance of Modern Farm Implements on hiring under ATMA organised by KVK, CIAE, Bhopal on 26 December, 2009	Technical lecture

TRAININGS

Trainers' training

S. no.	Topic	Date	Participants
1.	Interaction with Village Level Extension Paraworkers (VPEWs) for feed back and future needs	7 May, 2009	8 Village Level Extension Paraworkers of Orissa
2.	Pest management in <i>Kharif</i> vegetables	25 June, 2009	8 Village Level Extension Paraworkers of Orissa
3.	Strengthening gender role in agricultural R & D	4-5 Sept., 2009	24 Scientists, DRWA, BBSR
4.	Gender analysis: A methodology for sensitization and action	20-29 Oct., 2009	17 Scientists
5.	Value addition of tomato in tomato sauce, puree and chutney	19 Nov., 2009	8 Village Level Extension Paraworkers of Orissa
6.	IPM in winter vegetables	21 Nov., 2009	8 Village Level Extension Paraworkers of Orissa
7.	Strengthening gender role in agricultural R & D	08 Jan., 2010	25 Scientists, DRWA, BBSR
8.	Trainers' training-cum-workshop	18-19 Jan., 2010	12 Scientists and Research Fellows, CIFT, Cochin.
9.	Women empowerment and role of women in agricultural development, sponsored by State Agricultural Management and Extension Training Institute (SAMETI), Lucknow, Uttar Pradesh	2 - 6 Feb., 2010	36 Officers/NGOs/Farmers of UP
10.	Strengthening gender role in agricultural R & D	14-15 Feb., 2010	30 Scientists, BAU, Ranchi

Farmwomen training

S. no.	Topic	Place	Date	Participants
1.	Brood management and breeding of live-bearers	Singrisasan	6 April, 2009	20
2.	Backyard poultry	Mahinsa	13 May, 2009	19
3.	Awareness creation among women for selection and production of quality planty materials for pointed gourd vegetable	Ichapur	10 July, 2009	20
4.	Dissemination of weaning mix technology through demonstration	Jaypur	16 July, 2009	36

S. no.	Topic	Place	Date	Participants
5.	Water quality management for ornamental fish rearing	DRWA, Kharija	22 July, 2009	18
6.	Breeding and larval rearing of live-bearer	Phulapokhari	30 July, 2009	12
7.	Development of vermicomposting unit	Padasahi	21 Aug.,2009	25
8.	Ornamental fish breeding and culture	DRWA	25-27 Aug.,2009	25
9.	Water quality management for ornamental fish rearing	DRWA, Kharija	8 Sept., 2009	14
10.	Value addition in mushroom (pickle preparation)	Tangibanta and Padasahi	09 Sept., 2009	30
11.	Seed production, extraction, packaging and storage of vegetable seeds	Padasahi	13 Sept.,2009	40
12.	Seed production, extraction, packaging and storage of vegetable seeds	Kantamalim	13 Sept.,2009	40
		Simore and Kantamalim	20 Sept., 2009	30
13.	Value added fish products	Joypur	23 Sept., 2009	15
14.	Ornamental fish marketing	Panikata	23 Sept., 2009	14
15.	Insect pest identification in rice	Padasahi	26 Sept.,2009	12
16.	Integrated pest management	Padasahi	8 Oct.,2009	25
17.	Aquarium fabrication and installation	DRWA	15 Oct., 2009	17
18.	Breeding and culture of egg-layer	Panikata	20 Oct., 2009	17
19.	Scientists – farmers interface on Development strategies for gender empowerment through suitable brackish water aquaculture	Satapada	22 Oct., 2009	-
20.	Selection and production of quality planting materials of pointed gourd	Pipili	27 Nov., 2009	20
21.	Pond preparation and management	Velurhat	16 Dec., 2009	12
22.	Breeding and larval rearing of live-bearer	Budhipara	23 Dec., 2009	10
23.	Marketing of ornamental fish	Singrisasan	7 Jan., 2010	
24.	Dissemination of weaning mix technology through demonstration	Jaypur	12 Jan., 2010	30
25.	Breeding of gold fish	Ratilo Khamangasasan	6 -8 Feb., 2010	12
26.	Gold fish larval rearing	Phulapokhari	19 Feb., 2010	09
27.	Pig production	Jaypur	3 March, 2010	10
28.	IPM and vermicomposting	Kantamalim	30 March,2010	25

PUBLICATIONS

Research papers/ Abstracts

1. Agarwal, S. (2009). Farm mechanization and gender issues. Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, pp. 38-39.
2. Agarwal, S. and Nayak, H. (2009). Capacity building of farmwomen for management of natural resources for sustainable livelihood. Abstract : Conference on food and environmental security through resource conservation in Central India: Challenges and opportunities, pp. 123– 124.
3. Babu, N., Srivastava, S. K. and Prusti, M. (2009). Improving livelihood security of farmwomen through promotion of integrated pest management in homestead vegetable production. Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, pp. 26-27.
4. Babu, N., Srivastava, S. K., Arya M.P.S. and Srinath, K. (2009). Strengthening livelihood security of farmwomen through promotion of leafy vegetable –Amaranth. Abstract : International conference on horticulture (ICH-2009), Bangalore, p. 392.
5. Dash, H.K. (2010). Empowering rural women through village panchayats, Proceedings of IAUA conference on Operationalization of national policy on farmers 2007, 2-3 March, 2010. ANGRAU, Hyderabad, p. 22.
6. Dash, H.K., Samantray, S.K., Jena, M. and Mahonta, J. (2009). Micro finance to women self-Help groups by the banks – A macro perspective, Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, p. 17.
7. Srinath, K., Dash, H.K. and Sadangi, B.N. (2009). Gender equity supporting technologies in rice farming in Forecasting future technological needs for rice in India, eds. V. Ramasubramanian *et.al.*, Indian Agricultural Statistics Research Institute, ICAR, New Delhi: 107-117.
8. Mallick, P.K., Nayak, J. and Mishra, J.R. (2009). Front line demonstration on back yard poultry - A boon for rural women. *Journal of Agricultural Extension Review*, XXI. (3) : 28-29.
9. Mallick, P.K., Nayak, J., Prasad, S.M. and Das, K.M. (2008). Rice duck farming system: A profitable and environmentally sustainable enterprise, *Journal of Extension Education*, OSEE, XII. (1&2) : 68-72.
10. Mishra, S. (2009). Marketing behaviour of tribal women: An observation in Koraput district of Orissa. Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, pp. 10-11.
11. Mishra, S., Biswal, G. and Mohapatra, S. (2009). Role of SHG in livelihood of farmwomen. Abstract : National seminar on Managing rural livelihood in India: Challenges and opportunities, OUAT, Bhubaneswar.

12. Mishra, S., Sadangi, B.N. and Behera, B.C. (2009). Success in mushroom cultivation (in Oriya) Women empowerment series No.16, DRWA, Bhubaneswar, pp. 1-2.
13. Misra, A. K., Rama Rao, C. A., Subrahmanyam, K. V. and Ramakrishna, Y.S.R. (2009). Improving dairy production in India's rainfed agro-ecosystem: Constraints and strategies. *Outlook on Agriculture* 38, 3: 284-292.
14. Nayak, J. (2009). Rural farmwomen entrepreneurship - A scope for home scientists. Abstract : Seminar on home science education dimensions and directions, College of Home Science, OUAT, Bhubaneswar, 20 November, 2009.
15. Nayak, J. and Prasad, S.M. (2009). Dairy as a means of rural livelihood system. Abstract : National seminar on managing rural livelihood in India: Challenges and opportunities, OUAT, Bhubaneswar.
16. Nayak, J., Das, K.M., Lenka, S. and Swain, R. (2010). Evaluation of different methods for control of storage pest in rice. Abstract : National seminar on pest diversity in rice and their management under changed climate, CRRI, Cuttack, 15-16 March, 2010.
17. Nayak, J. and Swain, P. (2008). Reaction of members of women dairy cooperatives for sustainability of dairy units, *Journal of Extension Education, OSEE, XIII*. (1&2): 10-13.
18. Sadangi, B. N, Dash, H.K. and Srinath, K. (2009). Understanding gender perspective in agricultural research and development (Gender Note-2). DRWA, Bhubaneswar, pp. 1-4.
19. Sadangi, B.N. (2009). Strengthening the rural livelihoods through gender sensitive interventions – An overview, Lead paper and Abstract : National seminar on managing rural livelihood in India : Challenges and opportunities, OSEE, Bhubaneswar, pp. 104 - 108.
20. Sadangi, B.N., Dash, H.K., Mishra, S. and Behera, B.C. (2009). Involving village level para extension workers (VPEW) to address gender issues in extension-experiences from action research. Abstract : National seminar on women in agriculture, DRWA, Bhubaneswar, p. 24.
21. Satapathy, C. and Mishra, S. (2009). Efficiency of extension system. Abstract : National seminar on Enhancing efficiency of extension for sustainable agriculture and livestock production, IVRI, Izatnagar, 29-30, December, 2009, pp. 169-172.
22. Singh, A., Singh, H.S., Nath, V. and Sadangi, B.N. (2009). Farmwomen participation in vegetable pest management in coastal Orissa. *Veg. Sci.* 36, 3 supplementary : 331-37.
23. Singh, A., Sadangi, B.N. and Roy, S. (2008). Resource base of tribals in farm based livelihood patterns. *Journal of Extension Education, OSEE, XIII* (1&2): 135-146.
24. Singh, A., Sadangi, B.N., Roy, S. and Srinath, K. (2009). Perceived consequences and constraints of farm based livelihood patterns of tribals of Orissa. Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, p. 11.

25. Singh, D., Singh, S. P., Saxena, A. C., Biswas, H. S. and Saha, K. P. (2009). Status of farm machinery manufacturers in Madhya Pradesh. *Agricultural Engineering Today*, 33 (1): 14-19.
26. Singh, R. S., Singh, S. P. and Singh, S. (2009). Sale of tractors of different make in India. *Agricultural Engineering Today*, 33 (3): 20-37.
27. Singh, S. P. (2009). Ergonomical evaluation of some selected manually operated farm equipment with men workers. *Journal of The Institution of Engineers (India)*, 90 (June): 18-22.
28. Singh, S. P., Singh, R. S. and Agarwal, N. (2009). Women friendly improved farm tools and implements for commercialization. *Agricultural Engineering Today*, 33 (2): 20-33.
29. Singh, S. P., Singh, R. S. and Singh, S. (2009). Tractor production and sales in India. *Agricultural Engineering Today*, 33 (1): 20-32.
30. Singh, S. P., Katiyar, D. S., Theodorou, M. K., Prasad, S. V. S., Mishra, U. S., Bhaskar, R.B., Pandey, K. C., Verma, O.P.S. and Misra, A. K. (2009). Nutritional and morphological attributes of stay green vis-a-vis go-brown sorghum cultivars at different stages of maturity. *Indian Journal of Animal Sciences*, 79 (4): 426-432.
31. Srinath, K. and Dash, H.K. (2009). Governance and policy issues for community empowerment. Abstract : Conference on food and environmental security through resource conservation in Central India: Challenges and opportunities (FESCO-2009), Agra, 16-18, September, pp. 45-51.
32. Srinath, K., Dash, H.K. and Sadangi, B.N. (2009). Gender equity supporting technologies in rice farming. Proceedings of the workshop Forecasting future technological needs for rice cultivation, IASRI, pp.107-117.
33. Srinath, M., Sadangi, B.N., Arya, M.P.S., Agrawal, S. Tripathi, P.C., Mishra, A.K. and Dash, H. K. (2009). eds. Abstract : National seminar on Women in agriculture, published by Research Association for Gender in Agriculture, Bhubaneswar.
34. Srivastava, S.K., Babu, N. and Pandey, H. (2009). Traditional insect bio-prospecting - As human food and medicine. *Indian Journal of Traditional Knowledge*, 8 (4) : 485- 494.
35. Srivastava, S. K., Babu, N. and Srinath, K. (2009). Effect of panchgavya on growth, pest incidence, yield and shelf life of brinjal. Abstract : International conference on horticulture (ICH-2009), Bangalore, 9– 12 November, 2009, pp. 350-351.
36. Srivastava, S.K. and Babu, N. (2009). Assessment of banana pest management practices in Orissa with gender concern. Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, 4– 5 December 2009, pp. 27-28.
37. Srivastava, S.K., Sadangi, B.N. and Behera, B.C. (2009). Gender concerns in eco-friendly pest control measures in Brinjal. Abstracts : Abstract : National seminar on Women in agriculture, DRWA, Bhubaneswar, 4– 5 December 2009, pp.24-25.
38. Vatsa, D. K., Mann, S. S. and Singh, S. P. (2009). Mechanization scenario and energy use pattern of district Kangra, Himachal Pradesh : A case study. *Journal of the Institution of Engineers (India)*, 90 (June): 23-26.

Popular articles

1. Babu, N. and Srivastava, S.K. (2010). Strengthening farmwomen in integrated pest management in vegetables. *Sabujima*, 18: 27- 31.

2. Biswal, J.R., Sahoo, P.R., Dash, S.S.J. and Sahoo, P.K. (2010). Rangin machha chasa- gramina mahilanka pain artha uparjanara eka sarala pantha. *Krusakaban bandhu Arnapurna*, Bhubaneswar, Orissa, India, XVIII, (Jan) : 20-23.
3. Sahoo, P.K., Dash, H.K. and Biswal, J. (2009). Abyabahruta jalarashire matyachasa – aka samikhya, *Chasira sansara*, Jan-Feb, OUAT, Bhubaneswar, Orissa, India.
4. Satapathy, C. and Mishra, S. (2009). Agribusiness: An answer to eradication of unemployment, Interface between policy option and market measures for agribusiness development of Orissa : 25-30.
5. Singh, S. P. and Singh, S. (2010). Women friendly farm equipment and its requirement. *Agrovet Buzz*, 3 (1): 20-24.
6. Srivastava, S.K. and Babu, N. (2010). Healthier life-through pesticide risk reduction *Sabujima*, 18: 58- 63.

Technical bulletins/ Booklets / Compendia

1. Srinath, K., Samantaray, S.K. and Jena, M. (2010). Impact of SGSY on gender mainstreaming – NAIP case study series-1, DRWA, Bhubaneswar.
2. Misra, A.K., Sahoo, P. K., Sahoo, P. R. and Biswal, J. (2009). Backyard poultry for empowering rural women, DRWA Technical bulletin 15, pp-30.
3. Mishra, S. and Sadangi, B.N. and et.al. (2009). Compendium on gender analysis: A methodology for sensitization and action, ICAR sponsored short course, 20-29 October, 2009, pp-101.
4. Sadangi, B.N., Dash, H.K. and Mishra, S. (2009). Strategy for gender sensitive extension in agriculture and allied fields, DRWA Technical bulletin-11, pp-35.
5. Sahoo, P. K., Dash, H. K., Sadangi, B. N. and Misra, A. K. (2009). Carp fry production as an ecommic activity for rural women, DRWA Technical bulletin 12, pp-16.
6. Sahoo, P.K., Singh, Biswal, A. J. and Sahoo, P.R. (2010). Economic empowerment of rural women through fish-duck integration (in Oriya), DRWA Technical bulletin-10, pp-32.
7. Sahoo, P.K., Singh, A., Biswal, J.R. and Sahu, P.R. (2009). Gramin mahilanka arthik unnati pain samanvit machha-batak chash. pp-16.
8. Srinath, K. and Singh, S. P. (2009). Drudgery reducing technologies for farmwomen, DRWA Technical bulletin - 14, pp- 46.
9. Srivastava, S.K., Arya, M.P.S. and Babu, N. (2009). Low cost gender friendly techniques of pest and disease management in rice, DRWA Technical Bulletin 13, pp-46.
10. Tripathi, P.C., Babu, N. and Srinath, K. (2009). Gender issues in horticulture, DRWA- Women empowerment series- 13, pp-8.
11. Tripathi, P.C., Babu, N., Srinath, K. and Prusti, M. (2009). Bagvani mein lengik mudde (In Oriya). DRWA- Women empowerment series- 13, pp-8.
12. Tripathi, P.C., Babu, N. and Srinath, K. (2009). Bagvani mein lengik mudde (In Hindi). DRWA- Women empowerment series- 13, pp-8.
13. Tripathi, P.C. and Srivastava, S.K. (2009). eds. DRWA Newsletter, 2 (4), October 2008 – March 2009. Published by Director, DRWA, Bhubaneswar, Orissa.

Participation in Seminar/Workshop/Conference/Congress

1. A.K. Misra attended 13th Biennial Conference of Animal Nutrition Society of India. National Institute of Animal Nutrition and Physiology, Bangalore, 17-19 December, 2009.
2. A.K. Misra attended Annual Workshop of Network project on Enhancing livelihood of rural women through livestock production. Veterinary College and Research Institute, Namakkal, 24-25 February, 2010.
3. A.K. Misra attended 3rd International Conference on Global Interdependence in decision sciences. Administrative staff college of India, Hyderabad, 29-31 December, 2009.
4. H.K. Dash attended IAUA Conference of operationalization of National Policy for farmers, ANGRAU, Hyderabad, 2-3 March, 2010.
5. H.K. Dash attended NAIP review meeting on progress under V-PAGe, New Delhi, 29-30 December, 2009.
6. Naresh Babu attended International Conference of horticulture (ICH-2009), Bangalore, 9- 12 November, 2009.
7. Naresh Babu attended Seminar on Processing, marketing and value addition in coconut, Coconut Development Board, State Centre Orissa, 25 November, 2009.
8. P.K. Sahoo attended Annual Workshop of Network project on Enhancing livelihood of rural women through livestock production, Veterinary College and Research Institute, Namakkal, 24-25 February, 2010.
9. P. K. Sahoo attended Review Workshop on Capacity building of coastal fisherwomen through post harvest technologies in fisheries, DRWA, Bhubaneswar, 9-10 March, 2010.
10. S. Agarwal attended Conference on Food and environmental security through resource conservation in Central India: Challenges and opportunities (FESCO-2009), Agra, 16-18 September, 2009.
11. S. Agarwal attended National seminar on Empowerment of women: emerging challenges, at PAU., Ludhiana, 18-19 February, 2010.
12. S.K. Srivastava attended International Conference on Horticulture ICH 2009, Bangalore, 9 – 12 November, 2009.
13. S.P. Singh attended 44th Annual Convention and Symposium of Indian Society of Agricultural Engineers (ISAE), IARI, Pusa, New Delhi, 28-30 January, 2010.
14. S.P. Singh attended 4th National Conference on KVKs, Coimbatore, 6 - 8 November, 2009.
15. S.P. Singh attended Winter school on Drudgery reduction technologies for women to enhance productivity and safety in agriculture, College of Home Science, MPUAT, Udaipur, 24 November, 2009.
16. S.P. Singh attended Workshop-cum-seminar on Laboratory bio-safety and bio-security, HASDL (ICAR), Bhopal, 17 November, 2009.
17. Sabita Mishra attended Quarterly RPSC meet of All India Radio, Athagarh, Cuttack, 16 September, 2009.
18. Sabita Mishra attended RAC meeting of Door Darshna Kendra, NABARD, Bhubaneswar, 23 September, 2009.
19. Sabita Mishra attended meeting of State Level Extension Council, OUAT, Bhubaneswar, 4 September, 2009.

TV programmes/Radio talks/News paper coverage

Sabita Mishra participated in Live Phone-in programme of Door Darshna Kendra, Bhubaneswar on self help group gathan o' parichalana (SHG formation and management), 18 December, 2009.

AICRP on Home Science

Research papers

1. Antwal, P.N. Bhosale, P.B. and Bellurkar, C.M. (2009). Medicinal plants for diabetes. *Asian Agri-History*, 13 (2): 159 - 163.
2. Antwal, P.N. Bhosale, P.B. and Bellurkar, C.M. (2009). Women in dairy management: A case study. *Jr. of Dairying, Foods and Home Science*, 28(1): 64 – 66.
3. Antwal, P.N., Ekale, J.V., Bhosale, P.B. and Bellurkar, C.M. (2009). Leisure time utilization by rural youth. *Agriculture Update*, 4 (3&4):407-410.
4. Antwal, P.N., Bellurkar, C.M. and Bhosale, P.B. (2009). Effectiveness of combination of different communication media. *Agriculture Update*, 4 (3&4): 347-349.
5. Bains, S., Grewal, N., Kaur, M. and Grewal, J. (2009). Eco printing of cotton with Indian Rhubarb dye. *Textile Asia*, 110 (6):30-33.
6. Balda, S., Duhan, K. and Kym, Irving. (2009). Gender differences in temperament of preschool children. *International Journal of Family and Home Science*, 5 (2):89-92.
7. Balda, S. and Duhan, K. (2009). Peer relations in primary class children: A comparison of peer nomination and peer ratings. *Asian Journal of Home Science*, 4(1): 143-145.
8. Baruah, K. and Baruah, J. (2009). Adjustment differences of adolescents of working and non-working mothers in the area of education. *Indian Psychological Review*, 72 (3) : 74-91.
9. Bhalerao, V. S., Shaikh, R. M. and Gaikwad, S. R. (2009). Impact of child development center on rural early childhood children. *Psycho-Lingua*, (30 91): 88-95.
10. Chawla, A., Mahal, R. and Thind, S. (2009). Nurturing self esteem in rural adolescent girls in Punjab . *Praachi Psycho Lingua*, 39: 125-127.
11. Deka, M.B. and Roy, S. (2009). Development of technology kit for communication empowerment of women extension trainers (WETs). *Asian Journal of Home Science*, 4(1):186-189.
12. Devi, K. and Duhan, K. (2009). Adolescents problems in rural and urban single parent families. *International Journal of Family and Home Science*, 5 (1):15- 25.
13. Devi, K., Duhan, K. and Sangwan, S. (2009). Relationship of micro and meso human ecological environment on adolescent's problems in single parent families. *Asian Journal of Home Science*, 4 (1): 107-110.

14. Singh, D., Chih-heng, ke. and Dhaka, P. (2009). Enhancing quality of video over wireless IP Network. *Biannual Research International Journal*, IMS Manthan, 4:7-10.
15. Duhan, K., Chhikara, S. and Sangwan, S. (2009). Impact of intervention package on emotional intelligence skills of school teachers. *Journal of Psychometry*, 23 (2): 31-38.
16. Duhan, K. and Sangwan, S. (2009). Emotional intelligence : A vision. *Psycho-Lingua*, 39 (2) : 161-167.
17. Duhan, K., Chhikara, S. and Chaudhary, S. (2009). Level of emotional intelligence among school teachers. *Journal of Psychometry*, 23 (1) : 1-8.
18. Duhan, K., Chhikara, S. and Sangwan, S. (2009). Development of intervention package enhancing emotional intelligence skills of school teachers. *Indian Journal of social Research*, 50 (4):341-351.
19. Duhan, K., Chhikara, S. and Sangwan, S. (2009). Impact of stimulating activities on emotional intelligence skills of school teachers. *Indian Journal of Applied Psychology*, 46:59-65.
20. Tiwari, G., Sharma, V., Dhaka, P. and Ahlawat, I. (2009). Prevalence of neuroticism in old age people. *Asian Journal of Psychology and Education*, 42 :5-6.
21. Kanwar, V., Mahal, R., Thind, S. (2009). A study on status of girl child in Punjab, India. *Asian Journal of Home Schience*, 3: 239-242.
22. Kavita and Duhan, K. (2009). Gender differences in adolescents problems in single parent families. *International Journal of Family and Home Science*, 5 (2) : 149-154.
23. Kirtika, Sangwan, S. and Duhan, K. (2009). Multiple intelligence of slow learner young adolescents. *Psycho-Lingua*, 39 (1):74-77.
24. Mahal, R. and Thind, S. (2009). Impact of intervention programme on self-esteem of rural adolescent girls of Ludhiana district of Punjab. *Asian Journal of Home Science*, 4:219-224.
25. Srivastava, M. and Udawat, P. (2009). Eco-dyeing of silk with dhavdi flowers and its fastness evaluation. *Journal of Applied and Natural Science*, 1(2): 173-179.
26. Kanwar, P., Kapoor, A. and Sharma, N. (2009). An insight into mushroom cultivation as an income generating activity: Experience of a women's self help group in Himachal Pradesh. *Himachal Journal of Agricultural Research*, 35(1): 106-111.
27. Kanwar, P., Sharma, N. and Kapoor, A. (2009). Knowledge of rural women/ homemakers regarding improved kitchen tools. *Himachal Journal of Agricultural Research*, 35(1) : 100-105.
28. Rani, S. and Srivastava, M. (2009). A study on clothing satisfaction of aged female with present wardrobe. *Textile Trend*, 2(11):29-32.

29. Sangwan, S.S. and Duhan, K. (2009). Impact of intervention package on mental abilities of 5-6 years old slow learners. *Journal of Dairying Foods and Home Science*, 28 (3\4):209-215.
30. Saraswati, C.H. and Gaonkar, V. (2009). A study on child abuse among institutionalized children. *Karnataka Journal of Agricultural Sciences*, 22 (4): 869-873.
31. Sharma, N., and Kanwar, P. (2009). Indigenous water conservation systems—A rich tradition of rural Himachal Pradesh. *Indian Journal of Traditional knowledge*, 8(4): 510-513.
32. Kamat, S., Yenagi, N. and Nagnur, S. (2009). Consumption pattern of papad at household level and its availability in the local market. *Journal of Extension and Research*, 11: 79-80.
33. Kale, S., Naik, S. and Gaikwad, R. (2009). Mordant printed cotton fabric dyed in natural dye. *Man Made Textiles In India* : 279-281.
34. Kale, S., Naik, S. and Devdhar, S. (2009). Dyeing paithani silk saree with natural colours. *Indian Silk*, 48(8): 24-26.

Research Abstracts

1. Gahlot, M. and Papnai, N. (2010). Block printing of cotton using Kilmora dye. Abstract: CSIR Sponsored National Conference on Environmental Sustainability of Textile Industry. Jaipur, India.
2. Gahlot, M., Singh, K. and Bajpai, S. (2010). Best from waste: eco-friendly handmade paper. Abstract: CSIR Sponsored National Conference on Environmental Sustainability of Textile Industry. Jaipur, India.
3. Gahlot, M., Singh, K. and Bajpai, S. (2010). Value addition of textiles & handicrafts through natural dyes. Abstract: CSIR Sponsored National Conference on Environmental Sustainability of Textile Industry. Jaipur, India.
4. Gahlot, M., Massey, S. and Singh, A. (2010). Value addition of bichoo grass (*Gfrardinia heterophylla*): A source of income for rural hill women. Abstracts: National Seminar of the Society of Home Scientists for Agricultural and Rural Institutions, Punjab Agricultural University, Ludhiana, Punjab : p.27.
5. Rayangoudar, R., Nagnur, S. and Yenagi, G. (2009). Rural womens' knowledge of organic foods and farming. Abstract : National Seminar on Women in Agriculture, p. 22.
6. Nagnur, S., Hosamani, V. and Joshi, S. (2009). Stree Shakti and Ryot Mahila Sanghas – A profile and case studies of Dharwad Taluk. Abstract : National Seminar on Women in Agriculture, p.46.
7. Nagnur, S. (2009). Business Process Outsourcing (BPOs) empowering rural women. Abstract : National Seminar on Women in Agriculture, p. 21.

Popular articles

1. Hunshal, S., Koldur, M. and Attanimath, J. (2009). Asthitvakke horaata. *Krishi Kamadhenu*, 11(2):12-14.
2. Balda, S. and Duhan, K. (2009). Vishesh jaroorat wale bachhe. *Haryana Kheti*, 42 (12): 20-22.
3. Bhalerao, V. S., Shaikh, R. M. and Gaikwad, S. R. (2009). Grameen Balkanchya Vikasasathi Darjedar Purva Prathamik Shikshanachi Garaj. *Sheti Bhati*, Jan : 47-49.
4. Duhan, K. and Balda, S. (2009). Mata shishu ke beech bhavnatmak sanchar. *Haryana Kheti*, 42 (11):25-26.
5. Duhan, K. and Sangwan, S. (2009). Bhavnatmak vikas me mata pita ka yogdan. *Haryana Kheti*, 42 (12):12-20.
6. Duhan, K. and Sangwan, S. (2009). Sheeshu Ki Aadaate. *Haryana Kheti*, 42 (12): 22-24.
7. Duhan, K., Balda, S. and Sangwan, S. (2009). Shishu me Samanaya Vikas Ki jaanch partal. *Haryana Kheti*, 42 (12): 24-26.
8. Gaikwad, S. R. and Bhalerao, V. S. (2009). Kutumb Lahan- Sukh Mahan. *Sheti-Bhati*, Jan :15-16.
9. Pujar, L. and Hunshal, S. (2010). Maguvina kaliyuvike nidhanavideye?. *Krishi Kamadhenu*, 23(1): 36-38.
10. Pujar, L., Hunshal, S. and Netravati, H.S. (2009). Navajaata shishuvina ahaara karma. *Krishi Kamadhenu*, 1(7):39-41.
11. Pujar, L., Hunshal, S. and Netravati, H.S. (2009). Makkala ahaara krama. *Krishi Kamadhenu*, 1(10):11-13.
12. Pujar, L., Hunshal, S. and Netravati, H.S. (2009). Garbhaavastheyalli sukta ahaara karma mattu salahegalu. *Krishi Munnade*, 22(7): 44-46.
13. Nethravathi, H.S., Hunshal, S. and Pujar, L. (2010). Maguvina Poshaneyalli Alakshyatana Salladu. *Krishi Munnade*, 23 (3): 29-31.
14. Nethravathi, H.S., Hunshal, S. and Pujar, L. (2009). Makkalalli dyslexia. *Krishi Munnade*, 22(11):11-13.
15. Kaur, S. and Kaur, R. (2009). Pehrawe lai rangani di bhasha jano. *Changi Kheti*, PAU, Ludhiana.
16. Hunshal, S. and Pujar, L. (2009). Magu maatu kaliyuvaga mareyabaarada maatugalu. *Krishi Kamadhenu*, 22(12):11-13.
17. Hunshal, S. and Pujar, L. (2010). Makkaligu ive hakkugalu. *Krishi Munnade*, 23(2): 36-38.
18. Hunshal, S., Pujar, L. and Netravati, H.S. (2009). Makkala bhaavanathmaka belavanigeyalli paalakara paatra. *Krishi Munnade*, 22(10): 30-32.
19. Kale, S. (2010). Bachaticha Khara Mantra Junyapasoon Navnirmiteche Tantra. *Shetibhati Mahila Visheshank* : 4-5.

Manuals

1. Padma, A. (2009). Sisal fibre technology package for sustainable livelihood and employment generation in rural areas. (FFID) English and Telugu language.
2. Bains, S. and Kaur, R. (2009). Tie and Dye.

Composite books

1. Gahlot, M., Fatima, N. and Papnai, N. (2010). Natural dyes for colourful garments and healthy environment. Traditional Ecological Knowledge of Mountain people. Daya Publishing House, pp. 138-148.
2. Gahlot, M., Papnai, N. and Fatima, N. (2010). Unconventional fibers: processing and economic importance. Joshi, N.K. and Siugh, V. (eds.) Traditional ecological knowledge of mountain people. Daya Publishing House, pp. 138-148.

Training module

A Trainers' training module on Drudgery reducing technology interventions for women in agriculture. Technical module/FRM/2009.

Technical bulletin

Pukhan, A., Phukan, R. and Choudhury, S. (2009). Protective clothing for pesticide applicators.

Proceedings

XVIII Annual Workshop of AICRP on Home Science.

Media coverage

1. Use of artificial colours can cause health problems, The Tribune, 9 March, 2009, p.4.
2. Holi mouke te kudrati rangan di varton karo, Punjabi Tribune, 10 March, 2009, p.4.
3. Sukhe herbal rangon se manaye holi, City Bhaskar, 24 February, 2010, p.1.
4. Sisal fibre extraction and handicrafts making—Vartha, 6 April, 2009.
5. Conservation of natural resources for environmental protection, Andhra Jyothi, 20 June, 2008.
6. Handicrafts with sisal fibre — Ennadu, 7 April, 2009.

Training/ Seminar/ Conference attended

1. Deka, M.B. (2010). Women development and entrepreneurship. Paper presented in the National seminar on Women and entrepreneurship, sponsored by ICSSR, New Delhi, DCB College, Jorhat.
2. Shobha Nagnur. (2009). Business process outsourcing (BPOs) : Empowering rural women. National seminar on Women in agriculture held at DRWA, Bhubaneswar.
3. Rekha Rayangoudar, Shobha Nagnur and Ganga Yenagi. (2009). Rural womens' knowledge of organic foods and farming. National seminar on Women in agriculture held at DRWA Bhubaneswar.
4. Shobha Nagnur, Vijaya Hosamani and Sandhya Joshi. (2009). Stree shakti and ryot mahila sanghas – A Profile and case studies of Dharwad Taluk. National seminar on Women in agriculture held at DRWA Bhubaneswar.

5. Agrawal, N., Thakur, S. and Chaudhary, G. (2009). Mental health status of rural adolescent girls, paper presented in National seminar on Mental health and current scenario.
6. Agrawal, N., Chaudhary, G. (2009). Empowerment of rural adolescent girls: success stories, poster presented in 4th Uttarakhand State Science and Technology Congress.
7. Baruah, J., Khadi, P.B., Mayuri, K., Bangale, J., Nandwana, S., Manocha, A., Shubhabgana., Thind, K. and Ahuja, A. (2009). Farm Creche: A strategic approach for development of rural infants. Paper presented in World Academy of Science, Engineering and Technology. Paris.
8. Chaudhary, G. and Agrawal, N. (2009). Assessment of communication skills among rural adolescent girls, paper presented in 4th Uttarakhand State Science and Technology Congress.
9. Chaudhary, G. and Agrawal, N. (2010). Empowerment of adolescent girls in rural areas of Uttarakhand, poster presentation in National Seminar on Empowerment of Women: Emerging Challenges conducted by The Society of Home Scientists for Agricultural and Rural Institutions at College of Home Science, Punjab Agricultural University, Ludhiana.
10. Sangwan, S. and Duhan, K. (2010). Stress in Adolescent. Paper presented in National Seminar on Adolescence: The changing World, organised by Department of Home Science. Guru Nanak Girls College Santpura, Yamuna Nagar.
11. Bellurkar, C.M. (2010). Presented the paper on Gender role and responsibility in farming activities in National seminar, organized by MSEE at DBSKKV, Dapoli.
12. Promila Kanwar. (2009). Participated in two days FAO sponsored workshop on Promoting Indigenous People's Food System for Food Security, Shimla.
13. Indra Ahlawat and Gaytri Tiwari. (2009). Attended four day's multi-disciplinary International Conference on Emerging Issues and Global Economic Scenario, organized by Aishwarya College, Udaipur, sponsored by NEBAA USA, Laxpra Foundation, AWBS, UCCI, Udaipur.
14. Indra Ahlawat and Gaytri Tiwari. (2009). Attended six day's International Conference on Development, Dialogues and Dilemmas, organized and sponsored by International Rural Network Forum, Udaipur.
15. Indra Ahlawat and Gaytri Tiwari. (2009). Attended two day's National seminar on ICT for rural development: Access and applications, organized by The Institution of Engineers (India) Udaipur.
16. Indra Ahlawat and Gaytri Tiwari. (2010). Attended two day's International Conference on Women, work and health (Gender and the changing world of work and health) at Udaipur, organized and sponsored by UGC centre for women's studies, Department of Psychology, MLSU, Udaipur.
17. Gaytri Tiwari. (2009). Attended one day Samwad programme on Dayan Pratha: Ek samajik abhisahap, organized by UGC-CWS, MLSU, Udaipur, sponsored by National Council for Women (NCW), New Delhi.
18. Gaytri Tiwari. (2009). Attended two day's workshop on Prevention of domestic violence for personnel involvement in implementation of domestic violence act, organized by NIPCCD, Indore.

19. Grewal, N., Bains, S., Kaur, M. and Grewal, J. (2010). Eco Printing of cotton with red silk cotton tree, paper presented in National seminar of the SHSARI on Empowerment of women: Emerging challenges held at PAU, Ludhiana.

RECOGNITION AND AWARDS

1. S. P. Singh received the distinguished service certificate in the during 44th Annual Convention and Symposium of Indian Society of Agricultural Engineers (ISAE) held at IARI, Pusa, New Delhi, 28 January, 2010.
2. P.C Tripathi, Naresh Babu and Manoranjan Prusty received best paper award for the paper Gender preferences for cultivation of horticultural crops in the National seminar on Women in agriculture held at DRWA, Bhubaneswar, 4-5 December, 2009.
3. Naresh Babu acted as Judge at Annual state level flower show at Botanical Garden of RPRC Bhubaneswar, 9-10 January, 2010.
4. S. Agarwal served as Organizing Secretary of the National seminar on Women in agriculture held at DRWA, 4-5 December, 2009.

HUMAN RESOURCE DEVELOPMENT

1. Abha Singh, Scientist Senior Scale (Food & Nutrition) and Laxmi Priya Sahoo, Scientist Senior Scale (Seed and Technology) attended International training on Leadership for asian women in agriculture R&D at IRRI, Los Banos, Philippines, 1-11 December, 2009.
2. A.K. Misra participated in International Consultation on Crop-livestock systems for development. Embrapa Maize and Sorghum Research Centre, Sete Lagoas, Minas, Brazil, 23-26 March, 2010.
3. Abha Singh attended Trainer's training on Fish processing at CIFT, Cochin, 18-19 January, 2010.
4. S. Agarwal attended the training programme on 'Vigilance Administration' for Vigilance Officers of ICAR Institutes /PDS/NRCs held at IISR, Calicut, 22-24 February, 2010.
5. S.K. Srivastava attended the training programme on Awareness about coconut leaf beetle *Brontispa longissima* – a threat to coconut cultivation in India, organised by National Bureau of Agriculturally Important Insects, Bangalore and OUAT, Bhubaneswar, 28 January, 2010.

AICRP on Home Science

6. The team of scientists and research associates of Home Science Extension Education component from all the nine centers attended the seven days training entitled Development of Gender Responsive Multi- media Training Module at Department of communication studies, University of Pune, 16-22 December, 2009.
7. The team of scientists of Child Development component from all the nine centers attended Training on preparation of module in various life skills at Child in Need Institute (CINI), Poilan, West Bengal, 09 -14 November, 2009.
8. The team of scientists of Food & Nutrition Component from all the nine centers attended Training on training module preparation at College of Sericulture, Chintamani, UAS, Bangalore, 1- 4 July, 2009.

9. Indra Ahlawat attended ten day's Short Course on Computer aided apparel designing and production pattern making, organized by Department of textiles and apparel designing, College of Home Science, MPUAT, Udaipur sponsored by ICAR, New Delhi, 17- 26 August, 2009.
10. Gaytri Tiwari attended twenty one day's winter school on Drudgery reduction technologies for women to enhance productivity and safety in agriculture organized by College of Home Science, MPUAT, Udaipur, sponsored by ICAR, New Delhi, 17 November - 7 December, 2009.
11. Gaytri Tiwari attended five day's TOT on Preparation of training Module on Life skill education, organized by Child in Need Institute, Kolkata, sponsored by ICAR, New Delhi, 9 – 13 November, 2009.
12. Gaytri Tiwari attended ten day's Short Course on Computer aided apparel designing and production pattern making, organized by Department of textiles and apparel designing, organized by College of Home Science, MPUAT, Udaipur sponsored by ICAR, New Delhi, 17- 26 August, 2009.

Meetings attended by Krishna Srinath, Director

1. Mid Term Review meeting of XI Plan EFC at Kolkata, 30 October, 2009.
2. National Conference on KVK - 2009 at TNAU, Coimbatore, 6-8 November, 2009.
3. National Seminar on Home Science Education – Dimensions and directions at OUAT, Bhubaneswar, 23 November, 2009.
4. National Seminar on Women in Agriculture at PAU, Ludhiana, 17-18 February, 2010.
5. National Symposium on Noni for Empowerment and prosperity and Chaired session at Chennai, 24-25 October, 2009.
6. Review of Food & Nutrition component of AICRP at DRWA, Bhubaneswar, 12-13 November, 2009.
7. Meeting on Revised Estimates for EFC 09-10 with DDG (AE), 16-17 September, 2009.
8. Selection Committee for the post of Professor equivalent rank under CAS, Assam Agricultural University, Jorhat, 27 April, 2009.
9. State Level Research Advisory Council (SLRAC) meeting at OUAT, Bhubaneswar, 11 – 13 June, 2009.
10. Survey for Women in agriculture for gender database and visits of KVK at Koraput, 7 and 8 October, 2009.
11. Task Force meeting on Convergence and coordination of Govt programmes/schemes for gender equality and fighting social evils at New Delhi, 2 April, 2009.
12. Training-cum-Workshop on Network project on Capacity building of fisherwomen through fisheries post harvest technology, Cochin, 18 January, 2010.
13. Training programme on Methodologies in ergonomics for scientists of AICRP at DRDO, New Delhi, 24 July, 2009.
14. Visit of Union Minister for Agriculture and DG, ICAR at CIFA, Bhubaneswar, 4 - 5 July, 2009.

15. Workshop of DRWA Network project on Enhancing livelihood of rural women through livestock production, Veterinary College and Research Institute at Namakkal, 24 February, 2010.
16. Workshop on Effective Community Management of Biodiversity in an Era of Climate Change at OUAT, Bhubaneswar, 30 January. 2010.
17. XVII Extension Council Meeting of the CIFE, Mumbai as a Member, 18 September, 2009.
18. 29th Convocation of OUAT, Bhubaneswar, 14 November, 2009.
19. Conducted review meeting of Family Resource Management component of AICRP at New Delhi, 24 July, 2009.
20. Delivered key note address at the Regional Seminar on Gearing Home Science curriculum towards better career prospects at Avinashilingam University for Women, Coimbatore, 21-22 August, 2009.
21. Division-wise discussions with Secretary, DARE & DG, ICAR, 22 -23 January, 2010.
22. Foundation day celebration of ASPEE College of Home Science and Nutrition under Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, 17 November, 2009.
23. Foundation day celebration, CRRI, Cuttack, 2 May, 2009.
24. Foundation day celebrations, WTCER, Bhubaneswar, 12 May, 2009.
25. Gender planning and review workshop of livelihood project of NAIP, organized by IRRI under IFAD grant, 2 February, 2010.
26. ICAR Directors Conference and VC's Conference, 15-17 February, 2010.
27. ICAR Foundation Day and Director's Conference at New Delhi, 16 – 17 July, 2009.
28. ICAR-CIP meeting on collaborative research work plan at NASC Complex, New Delhi, 2 March, 2010.
29. Inaugural session of ICAR sponsored Short Course on Gender analysis : A mythology for sensitization and action, DRWA, Bhubaneswar, 20 September, 2009.
30. Indian Fish Festival, 2009 organized by National Fisheries Development Board at Hyderabad, 11 July, 2009.
31. Interview Board for Selection of T-6 (Home Science) for KVK at Indian Institute of Spices Research, Calicut as Expert Member, 19-22 December, 2009.
32. Krishi Mela at IARI as a speaker at the session on Women in agriculture, 5 March, 2010.
33. Meeting of Board of management of OUAT, Bhubaneswar, 12 November, 2009.
34. Meeting of the Screening committee for nomination for DST National Award for Women's Development, 22 February, 2010.
35. Meeting on the newly sanctioned component under V-Page, NAIP at IRRI-India office, New Delhi, 26 May, 2009.
36. Meeting with Chief Executive NFDB, Hyderabad regarding DRWA Network project on Fisheries post harvest, 23 April and 3 May, 2009.

Locations of DRWA Network projects and AICRP on Home Science



LIST OF PROJECTS

Network Projects

Development of expert system for crop and animal enterprises

S. no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	M. Srinath
2.	ZCU, Zone VIII, Bangalore	S. Prabhukumar
3.	DOEE, TNAU, Coimbatore	E. Vadivel R. Venkattachalam N. Sriram
4.	DOEE, TANVASU, Chennai	G. Thulasi V. Appa Rao

Public private partnership for gender mainstreaming in agriculture

S.no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	Krishna Srinath Sabita Mishra
2.	KAU, Kerala	Binoo P. Bony
3.	CCSHAU, Hissar	Nishi Sethi
4.	AAU, Jorhat	Manju Dutta Das
5.	AUW, Coimbatore	K. Thangamani
6.	MPUAT, Udaipur	Snehalata Maheshwari

Enhancing livelihood of rural women through livestock production

S.no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	A. K. Misra P. K. Sahoo
2.	IVRI, Izatnagar	Hema Tripathi Triveni Dutt
3.	ICAR Research Complex for NEH Region, Umiam	Anupam Mishra G. Kadirvel
4.	VC&RI, Namakkal	N. Narmatha R. Amutha A. Manivannan K. M. Sakthivel V. Uma
5.	PG IV & AS, Akola	R. N. Dhore S. G. Mode

Capacity building of coastal fisher women through post harvest technologies in fisheries

S.no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	P.K. Sahoo Abha Singh
2.	CIFT, Kochi	Ravi Sankar Nikita Gopal
3.	CIFE, Mumbai	B. B. Nayak Arpita Sharma
4.	NFDB, Hyderabad	C. K. Murthy M. Vallathan
5.	FC&RI, Thoothukudi, TANUVAS, Chennai	G. Sugumar M. Nagoor Meeran
6.	College of Fisheries, OUAT, Bhubaneswar	B. K. Khuntia S. Nanda
7.	KVK, ANGRAU, West Godavari	A. Srinivas Rao J. Lakshmi

Gender issues in rice based production system and refinement of selected technologies in women perspective

S.no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	M. P. S. Arya S. K. Srivastava S. P. Singh
2.	CRRI, Cuttack	Lipi Das Annie Poonam
3.	DRR, Rajendranagar, Hyderabad	S. P. Singh P. Muthu Raman
4.	KAU, Vellanikkara, Trichur	P. S. John P. Rajendran
5.	GBPUAT, Pantnagar	P. S. Bisht P. C. Pandey B.M. Pandey

Assessment of gender issues and identification and refinement of selected women specific technologies in horticultural crops

S.no	Network Centre	PI / Co PI
1.	DRWA, Bhubaneswar	P. C. Tripathi Naresh Babu L. P. Sahoo
2.	IIHR, Bangalore	D. V. Sudhakar Rao Nita Khandekar
3.	CTCRI, Thiruvananthapuram	M. Anantharaman S. Ramanathan J. Sreekumar
4.	CIPHET, Ludhiana	R.K. Gupta
5.	CISH, Lucknow	S. K. Shukla S. Chandra
6.	CITH, Mukteshwar	B. L. Attri Pragya

Institute Projects

S. no.	Project	Period	PI and Co-PI
1.	Development of gender information system in agriculture	April, 2008 - March, 2012	H. K. Dash M. Srinath Sabita Mishra
2.	Designing gender sensitive extension model and testing its efficacy	April, 2007 - March, 2012	B.N. Sadangi Sabita Mishra H.K. Dash S.K. Srivastava P.K. Sahoo L. P. Sahoo Abha Singh
3.	Involvement of tribal women in marketing of selected agricultural and non-timber forest produces (NTFP) in Orissa	April, 2009 - March, 2012	Sabita Mishra H. K. Dash
4.	Resource base, traditional knowledge and participation of farmwomen in livestock production	April, 2008 - March, 2011	A. K. Misra P. K. Sahoo Abha Singh
5.	Assessment and refinement of aquaculture technologies for gender mainstreaming	April, 2008 - March, 2011	P. K. Sahoo M. Srinath A. K. Mishra
6.	Refinement of storage pest management techniques in selected cereals, pulses, condiments and spices with gender perspective.	April, 2008 - March, 2011	S. K. Srivastava Suman Agrawal Naresh Babu
7.	Refinement and development of horticulture based cropping models for gender mainstreaming	April, 2009 - March, 2012	P.C. Tripathi Naresh Babu
8.	Assessment of gender issues, identification and refinement of selected women specific technologies in horticultural crops	April, 2009 - March, 2012	P.C. Tripathi Naresh Babu
9.	Refinement of vegetable based organic farming practices with gender perspective	April, 2009 - March, 2012	Naresh Babu M.P.S. Arya S.K. Srivastava
10.	Technological empowerment of farmwomen in production of quality seeds and planting materials of vegetables	August, 2009 - July, 2012	L. P. Sahoo Naresh Babu P.C. Tripathi M.P.S. Arya
11.	Empowerment of farmwomen through information communication technologies (ICT)	April, 2009 - March, 2012	Suman Agarwal Sabita Mishra
12.	Participatory evaluation of low cost weaning mix	June, 2007 - May, 2010	Abha Singh
13.	Nutritional security as related to livelihood patterns among tribal families of Orissa	August, 2008- July, 2010	Abha Singh B.N. Sadangi
14.	Ergonomical interventions in developing hand operated maize dehusker-sheller for farmwomen	April, 2009 - March, 2011	S. P. Singh
15.	Economic upliftment of rural women through integrated fish farming	September, 2007- March, 2010	P.K. Sahoo B.N. Sadangi Abha Singh
16.	Visioning Policy Analysis and Gender under NAIP	April, 2008 - March, 2012	Krishna Srinath H. K. Dash
17.	AICRP on Home Science		

PERSONNEL

(As on 31 March, 2010)

S. no.	Name	Designation
1.	Krishna Srinath	Director
2.	M. Srinath	Principal Scientist (Agricultural Statistics)
3.	Biswanath Sadangi	Principal Scientist (Agricultural Extension)
4.	Mahendra Pal Singh Arya	Principal Scientist (Agronomy)
5.	Suman Agarwal	Principal Scientist (Human Development)
6.	Prakash Chandra Tripathi	Principal Scientist (Horticulture)
7.	Arun Kumar Misra	Principal Scientist (Livestock Production and Management)
8.	Santosh Kumar Srivastava	Senior Scientist (Entomology)
9.	Shiv Pratap Singh	Senior Scientist (Farm Machinery and Power)
10.	Naresh Babu	Senior Scientist (Horticulture)
11.	Sabita Mishra	Senior Scientist (Agricultural Extension)
12.	Pravati Kumari Sahoo	Senior Scientist (Fish & Fisheries Science)
13.	Hemanta Kumar Dash	Senior Scientist (Agricultural Economics)
14.	Jyoti Nayak	Senior Scientist (Family Resource Management)
15.	Laxmipriya Sahoo	Scientist Senior Scale (Seed Science and Technology)
16.	Abha Singh	Scientist Senior Scale (Food and Nutrition)
17.	Geeta Saha	Technical Officer (T-5)
18.	Nidhi Agarwal	Technical Assistant (T-4)
19.	Manoranjan Prusty	Technical Assistant (T-3)
20.	Debendra Nath Sarangi	Technical Assistant (T-3)
21.	Prajananu Ranjan Sahoo	Technical Assistant (T-3)
22.	Bhikari Charan Behera	Technical Assistant (T-3)
23.	Bishnu Charan Sahoo	Technical Assistant (T-3)
24.	Sunil Kumar Das	Assistant Finance and Accounts Officer
25.	V. Ganesh Kumar	Assistant Administrative Officer
26.	Rina Das	Personal Assistant
27.	Parisima Sen	Stenographer (G-III)
28.	Sanjay Kumar Singh	Senior Clerk
29.	Bishnupriya Moharana	Senior Clerk
30.	Biswanath Biswal	S.S.G.1

ACRONYMS USED

AAU	Assam Agricultural University	IMC	Institute Management Committee
AICRP	All India Coordinated Research Project	IPM	Integrated Pest Management
ANGRAU	Acharya NG Ranga Agricultural University	IRC	Institute Research Council
ARIS	Agricultural Research and Information System	ITK	Indigenous Technical Knowledge
AUW	Avinashilingam University for Women	IVRI	Indian Veterinary Research Institute
BAU	Birsa Agricultural University	KAU	Kerala Agriculture University
BCR	Benefit Cost Ratio	KVK	Krishi Vigyan Kendra
BMI	Body Mass Index	MAFSU	Maharashtra Animal & Fishery Sciences University
BT	<i>Bacillus thuringiensis</i>	MAU	Marathwada Agricultural University
BYP	Back Yard Poultry	MPUA & T	Maharana Pratap University of Agriculture & Technology
CCSHAU	Choudhary Charan Singh Haryana Agricultural University	NAIP	National Agricultural Innovation Project
CED	Chronic Energy Deficiency	NFDB	National Fisheries Development Board
CIAE	Central Institute of Agricultural Engineering	NRCWA	National Research Centre for Women in Agriculture
CIBA	Central Institute of Brackish Water Aquaculture	NTFP	Non-Timber Forest Produces
CIFE	Central Institute of Fisheries Education	OUAT	Orissa University of Agriculture and Technology
CIFT	Central Institute of Fisheries Technology	PAU	Punjab Agricultural University
CIPHET	Central Institute of Post Harvest Engineering and Technology	PGIV & AS	PG Institute of Veterinary and Animal Sciences
CISH	Central Institute of Subtropical Horticulture	PLW	Physiological Loss of Weight
CITH	Central Institute of Temperate Horticulture	PME	Project Monitoring and Evaluation
CMFRI	Central Marine Fisheries Research Institute	PPP	Public Private Partnership
CPR	Common Property Resources	PRA	Participatory Rural Appraisal
CRRRI	Central Rice Research Institute	RAC	Research Advisory Committee
CSKHPKV	Choudhary Saran Kumar Himachal Pradesh Krishi Viswavidyalaya	RMP	Research Management Position
CTCRI	Central Tuber Crops Research Institute	SAMETI	State Agricultural Management and Extension Training Institute
DARE	Department of Agricultural Research and Education	SAU	State Agricultural University
DIPA	Directorate of Information and Publication in Agriculture	SHG	Self Help Group
DOEE	Directorate of Extension Education	SMS	Subject Matter Specialist
DRR	Directorate of Rice Research	SPSS	Statistical Package for Social Sciences
DRWA	Directorate of Research on Women in Agriculture	STEP	Support to Training and Extension Programme
FC&RI	Fisheries College and Research Institute	TANUVAS	Tamil Nadu University of Veterinary and Animal Sciences
FMD	Foot and Mouth Disease	TNAU	Tamil Nadu Agricultural University
FYM	Farm Yard Manure	TSS	Total Soluble Solid
GBPUAT	Govind Ballabh Pant University of Agriculture and Technology	UAS	University of Agricultural Sciences
HP	Horse Power	VCRI	Veterinary College and Research Institute
HS	Haemorrhagic Septicaemia	V-PAGE	Visioning, Policy Analysis and Gender
ICAR	Indian Council of Agricultural Research	VPEW	Village Para Extension Worker
ICT	Information Communication Technology	WSHG	Women Self Help Group
IEC	Information Education and Communication	ZCU	Zonal Coordinating Unit
IIHR	Indian Institute of Horticultural Research	ZECC	Zero Energy Cool Chamber



Directorate of Research on Women in Agriculture
 (Indian Council of Agricultural Research)

Bhubaneswar - 751 003, Orissa, India

Phone: +91-674-2386220, Fax: +91-674-2386242

email: director@drwa.org.in, web: <http://www.drwa.org.in>