

वार्षिक प्रतिवेदन Annual Report 2016-17



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



Annual Report 2016-17

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Preface



Farm woman has a dual responsibility, first as a home maker and second as a farmer. She has a important role to play in the agricultural development in the country besides raising a healthy family by securing household nutrition. Therefore, enhancing productivity and profitability of small and marginal is necessary where women's contribution is most profound as agricultural labour and cultivator. ICAR- CIWA, being the only Institute to take up the cause of women farmers in India, is striving to empower them and to ease their burden through identifying and understanding the constraint, issues, scope and opportunities for women in agriculture and devising solution by research, participation, capacity building and consultancies. The Institute is also striving address the

challenges of farm women against the changing agricultural scenario. It aims to generate and disseminate knowledge to promote gender sensitive decision making. The Institute has been making conscious efforts to emerge as a leading centre for gender research and serve as a catalyst for gender mainstreaming and women empowerment in agriculture by working at a grass root level as well as establishing itself on a global stage.

The Institute has made its presence felt in more than 80 villages and 18 states during last year. It has developed collaborations with 15 national and international institutes for strengthening the gender mainstreaming in agriculture. The major focus of the Institute in the recent past has been improving the livelihood opportunities of women engaged in the agriculture and allied sectors, gender database with due emphasis on the divergent location specific needs and techno-social leadership capabilities of the farm woman. To meet the diverse challenges there is an urgent need to reorient the programs, policies, strategies and institutional arrangements for mainstreaming farm women in the agricultural development.

A number of models were developed and implemented for livelihood improvement of farm families like, location specific need based integrated pest management model, integrated farming system models, resource efficient horticulture models. Gender sensitization of stakeholders was done through various workshops, radio programs, voice messages and checklists were developed for assessing gender sensitivity of working environment, institutional programs, extension methods, agricultural technologies and integrating gender perspective in agricultural extension research project. Empowerment in Crop Production Index (ECPI) was also developed. Millet processing units were established, with the involvement SHGs to encourage entrepreneurship among the tribal women. Integrated farming systems models were standardized to the cater needs of food, fodder, fibre and income generation. To address the nutritional issues an exploratory study on nutritional status of farm households in Nabarangpur district of Odisha is being carried out. Backyard nutrition gardens, backyard poultry, drudgery reducing tools were promoted to improve the quality of life. Livestock technologies such as promoting cultivation of green fodder, balanced feeding of animals etc were taken to women livestock keepers to improve, livestock and poultry.

To address the drudgery issues and productivity of the farm women engaged in horticultural plantations like mango and cashewnut tools were developed. Women friendly farm tools were scaled up in training cum manufacturing unit constructed under Rashtriya Krishi Vikas Yojana (RKVY) for dissemination of women friendly tools and equipment to enhance working efficiency of farm women. Through ergonomic studies test protocol for tool, ergonomic database, farm tools and implement repository, crop based tool packages, ergonomic training module for capacity building, checklist for assessing knowledge gain were developed to increase work efficiency and productivity of farm women.

Capacity building and skill upgradation programmes were regularly carried out under Tribal Sub Plan (TSP) for upliftment of tribal women. The Important days such as Women in Agriculture Day, Jai Jawan Jai Kisan etc were celebrated and used as a platform to showcase Institutes' activities.

Agriculture development cannot be separated from rural home development as both are interlinked and households with better agricultural development helps disseminate technologies down to other households in the rural areas. The All India Coordinated Research Project on Home Science with its five discipline Food & Nutrition, Textile & Apparel Designing, Home Science Extension & Communication Management, Family Resource Management and Human Development and Families Studies deals with development of rural families, to address need based issues. The significant achievements during the period of report were in the areas of dynamics and performance of women groups in agriculture and allied sector, nutritional diversity in selected farming systems, identification, and characterization of drudgery of farm women and technology packages for mitigating drudgery, functional clothing to reduce occupational health hazards, utilization of plant and animal fibres for textile application and empowerment of rural youth and livelihood security of farm families.

As ICAR-CIWA has a larger role to play in the National Agricultural Research and Education Systems. Capacity building programmes were organized through sensitization programmes for various stakeholders like development functionaries, research scientists/ managers, teachers and KVKs scientists/ SMS who are directly or indirectly associated with farm women empowerment.

I feel great satisfaction in presenting the salient achievements of the ICAR-CIWA in the Annual Report. I am highly grateful to Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR), for his keen interest in the development of this Institute. I express my sincere gratitude to Dr. Narendra Singh Rathore, Deputy Director General (Agricultural Education) for his guidance and timely support and Dr. P. S. Pandey, Assistant Director General (Education Planning and Home Science) for his guidance and critical inputs in achieving the goals set for the Institute. I express my gratitude to all scientists and staffs of the Institute and AICRP on Home Science for their wholehearted support and cooperation in bringing out the present Annual Report timely.

ICAR-CIWA
Bhubaneswar

(Jatinder Kishtwaria)
Director

EXECUTIVE SUMMARY

ICAR- Central Institute for Women in Agriculture (ICAR-CIWA) is a unique research institute with the mandate of carrying out research on gender issues in agriculture. During 2016-17, the institute implemented a number of institutional research projects in addition to coordinating activities of AICRP on Home Science at 11 different States in the country. The outputs of the research including gender related information, knowledge and models in agriculture and allied activities have the potential of benefiting different stakeholders including farm women.

Capacity building and skill up gradation taken up under various research projects benefited 340 tribal farm families through 19 field level demonstrations and technological interventions in improved methods of vegetable cultivation, nutrition gardening, intercropping for additional income generation, hygienic storage and drudgery reduction. The Tribal Sub-Plan on "Multi-Sectoral Package of Practices for Nutrition and Livelihood Enhancement of Tribal Families", improved the farming and household nutrition status of the tribal families. Nutritional and economic security of tribal farm women was addressed under the project "Engendering millet based value chains for promoting livelihood opportunities of farmwomen in selected states". Opportunities for farm women of Koraput district in processing and value addition in finger millet value chain were identified. For creating an enabling environment for meaningful participation of women in ragi processing, two millet processing units were established in Koraput district, with the involvement of two clusters of SHGs, which were also mobilized for forward linkages. For assessing the nutritional status of tribal women of Nabarangpur district, identification of gaps in people's knowledge, attitudes and dietary practices etc. were studied. To improve the family nutrition, improved varieties of tapioca and sweet potato were introduced among 85 farmers and farm women under the project "Exploratory study on nutritional status of Nabarangpur district Odisha"

The outreach project on "Development and testing of

institutional innovations for empowering women in agriculture" primarily focused on gender sensitization of the stakeholders engaged in research, extension and developmental works related to women in agriculture. For realizing this, three workshops, involving NGOs, media and Institute personnel; four training programs benefiting more than 2500 farm women on jute handicraft, garden tools, oyster mushroom cultivation and other crops were conducted. Radio programs, voice message services, success stories documentation, development of training modules and checklists etc were used as potential outreach strategies for including gender in institutional programmes and disseminating institutional innovations to the end users. For integrating gender perspectives in agricultural research and extension, 'Empowerment in Crop Production Index' (ECPI) has been developed under the project "Study on gender related indices in agriculture". The validity of developed index was ascertained through content validity. The developed index was tested and verified. The factors influencing agri-entrepreneurship development by rural women were identified through a checklist. Suitable agri-educational modules were developed and workshops were conducted involving R&D stakeholders and women stakeholders under the project "Promoting agricultural education among rural women for entrepreneurship development".

Eight agriculture and animal husbandry based integrated farming system models were implemented through various projects emphasizing on development of sustainable production systems such as, "Integrated farming system for improvement of nutrition and livelihood of farm women under different agro-ecosystems" and "Assessment of integrated farming model for improved food security and livelihood in rural household", which benefited 130 farm-families in three villages consisting of crop component (high yielding short duration varieties replacing the traditional once), poultry component (Vanaraja breed), fiber component (jute), and fisheries component (Catla, Rohu and Mrigal). It was recommended that, a model of 1.5 acre (0.9 acre, grown crops, 0.45 acre, horticulture, 0.07 acre, honeybee, 0.06 acre, cow shed, 0.02 acre, bio-compost)

was suitable for increasing income of a five member family over traditional cropping system by 33 percent. A resource efficient horticulture model was developed with drip irrigation, crop diversification, high density plantation, protected cultivation, coconut based multi-storey cropping, intercropping options with banana, drumstick, staking method of vegetable cultivation, mulching in pineapple etc to maximize farm income with limited land holdings in the project "Development of resource efficient horticulture model for livelihood improvement of rural women". Farmwomen were sensitized in integrated pest management through various interventions like seed treatment, machan planting system, resistant varieties, pheromone trap, yellow sticky trap, neem oil and trichocard in the farmers field.

Replacement of existing local varieties with high yielding varieties of horticultural crops, introduction of improved nursery raising methods, improved vegetable cultivation practices, backyard nutritional garden, conservation of water organic manuring, vermi composting and proper cultivation practices for apple, apricot, plum, kiwi, peach, tomato, capsicum, bean etc were used for providing livelihood to 450 tribal women of 10 villages at 5 centres under the collaborative project on "Livelihood and nutritional improvement of tribal farmwomen through horticulture". It was found that technological interventions in horticulture could result in increased income of farm family by 34 per cent. For further improvement of livelihood of women the project on "Promoting gender equity through family poultry production" alternate non competitive feed ingredients in poultry feed was standardized by incorporating azolla up to 10 per cent in the diet of Vanaraja laying hens without any adverse affect on egg production and egg quality. Socio economic profile of 100 households from 3 selected villages was collected for possible interventions for their livelihood improvement. For improving quality of life of farm women in a tribal village, where 37 per cent women were Chronic Energy Deficient (CED) from mild to severe degree, a project on "Empowerment of farm women for improved quality of life" was taken up. The project intervention was made in nutrition, income generation and drudgery aspects of 40 selected households through nutrition gardens, nutrition

education, and use of drudgery reducing tools, smokeless chullah and poultry rearing.

Different projects were taken at ICAR-CIWA for reducing operational drudgery and increasing efficiency of farmwomen. The project "Ergonomic evaluation of selected manually operated farm equipments in mango and cashew nut", evaluated selected manually operated farm equipment and the energy expensive activities were identified. Minor orchard tools, fruit harvesters developed by BSKKV, Dapoli and this Institute with adjustable handles were introduced and found to be useful. In the project "Technological interventions for drudgery reduction with increased work efficiency through women friendly farm tools/ equipment/ technologies in the state of Odisha funded by Rastiya Krishi Vikash Yojna, two women friendly farm tools namely seed treatment drum, cotton stalk puller were scaled up. Eight tools (700 pieces) viz., DRWA hand operated maize dehusker-cum-sheller, cono weeder, paddy drum seeder, CRRI hand winnower, sitting type groundnut decorticator, hanging type grain cleaner, tubular maize sheller and improved sickle were disseminated to SHGs through KVKs of OUAT for field assessment. Further a tools and implements repository, database on gender friendly tool packages for paddy, vegetables and maize, checklists and test protocol for hand ridger were developed under the project "Ergonomic Studies for Increasing Work Efficiency and Productivity of Farm Women"

The All India Coordinated Research Project (AICRP) on Home Science is in operation at twelve Centres/ SAUs viz. CCSHAU, Hisar; PAU, Ludhiana; UAS, Dharwad; UAS, Bengaluru; MPUAT, Udaipur; PJTSAU, Hyderabad; GBPUAT, Pantnagar; VNMKV, Parbhani; AAU, Jorhat, CSKHPKV, Palampur, TNAU, Madurai and CAU Tura. It focuses on women empowerment, drudgery assessment and mitigation, food & nutrition security in selected farming system, mitigating occupational health hazards and capacity building of agrarian families under the five components of home science viz., Home Science Extension & Communication Management, Family Resource Management, Food & Nutrition, Textile and Apparel Designing and Human Development & Family Studies.

Under Home Science Extension & Communication Management component, two projects titled "Dynamics and performance of women groups in agriculture and allied sectors" and "Techno socio-economic dimensions of women empowerment" were carried out. In the first project, secondary data were collected from 2832 SHGs out of 3749 formed by different agencies in the selected districts of ten states in which the project is running. Data were collected on profile of the group members, group dynamics, group activities and income generation/ entrepreneurship and empowerment status. A campaign was organized for creating awareness regarding popularization of kitchen and herbal gardens and vermin-composting units were established.

In Family Resource Management component, a project titled "Characterization of drudgery of women in the production environment and assessment of technology packages in mitigating drudgery" was taken up in which drudgery of women was characterized for 3 crops & five production systems in the adopted villages. Twelve technologies were refined/ developed and tested. Four technologies were ergonomically evaluated viz., seed cum fertilizer dibbler, rice picker, evaluation of sapling transplanter and flower harvest bag. Twenty six technologies were up scaled as per the farmers need by disseminating them through SHG groups

In Food & Nutrition component, the project titled "Food and nutritional strategies to combat nutritional problems among farm families" was implemented with a standardized questionnaire in which information on socio-economic status, assessment of haemoglobin status, anthropometric assessment, clinical signs and symptoms, assessment of knowledge, awareness and practice (KAP) among adolescent girls, nutrient intake of the adolescent girls were taken up. A total of 2932 school going adolescent girls out of 5069 were screened out with haemoglobin level less than 12g /dl in rural areas to study the diversity in food consumption pattern by using a standard biochemical procedure and standardized questionnaire. Diet survey of subjects (control 35, experimental 35 nos.) was done before intervention programme. Among all the ten centres the mean energy intake for both control and experimental group was lowest for Rajasthan centre i.e. 940.05 & 836.54 kcal and highest in Karnataka centre i.e., 2180.51 & 2365.83

respectively which meets only 40.87 & 35.90 per cent and 93.58 & 101.55 per cent respectively of the Recommended Dietary Allowances.

Under Textile & Apparel Designing component, two projects titled "Functional clothing to combat occupational health hazards of farm workers" and "Utilization of plant sources for textile processing" were carried out. For combating occupational health hazards functional clothing kit viz., head gear with mask, protective shirt & pant, gloves, apron, protective kurta without hood, protective kurta with hood, triangular mask and knitted fabric face cover were designed and developed for the workers engaged in different activities in agriculture, agriculture allied sectors & textile sectors and assessed for its suitability and acceptability among workers through wear trials. Refinement in developed functional clothing namely apron, pleated mask and knitted gloves was done according to suggestions of respondents. During the period under report four technologies were scaled up namely kurta pajama (15), protective gloves (15), protective mask (15) and functional clothing kit (head gear, mask, apron, gloves) (342) to KVKs, Kisan Club, SAUs and EEU. For extraction and processing of non-conventional fibres from underutilized plant sources, different products viz., shopping bag, pen stand, purse, tea cozy, pot mat, coaster, file cover, seed pot etc. were prepared from bhindi fibre and non woven fabric.

In Human Development & Family Studies component, two projects titled "Developing competency of rural youth in agriculture through vocational intervention" and "Sensitizing rural families for management of socio-emotional problems of youth" were implemented. A total sample of 1167 academically backward children from 10 centres was selected for developing competency of rural youth in agriculture. It was found that students from Jorhat, Hisar, Palampur, Pantnagar, Udaipur and Ludhiana showed high external resilience in case of school, home, community and peer assets which covers caring relationship, high expectation and meaningful participation at school, home, community and caring relationship in peer. Assessment of socio-economic status of 349 school dropout youth was carried out which showed that majority of the respondents belonged to lower middle income

category. Percentage analysis of socio-emotional problems of children depicted that Palampur (35.09%), Hyderabad (33%), Jorhat (22.86%), Udaipur (17.5%) and Hisar (12.1%) children had mild socio emotional problems. Amongst all centers Parbhani and Dharwad (100%) center reported that the children under study depicted had severe emotional problems.

Considering the changing faces of rural livelihoods in India, the AICRP on Home Science carried out the family and group entrepreneurship development with market linkage looking for sustainability in their livelihood security. Three protein rich recipes viz., mix pulse shev, proteimix powder, peas stick & millet & moringa powder based value added products were developed and transferred into rural entrepreneurship. A Counseling centre was established at Hatichungi Komar Gaon, AAU, Jorhat to become financially independent and established entrepreneurship unit. Swachha Bharat Abhiyan was carried out by all the AICRP on Home

Science centres in schools, Anganwadi, operational villages etc. Training, lecture, awareness rally regarding importance of personal and environmental sanitation was given to them.

Besides these project activities, different programs such as Foundation Day of ICAR-CIWA, Women in Agriculture Day, Jai Kisan Jai Vigyan, International Women's Day, Vigilance Awareness Week, National Productivity Week, The National Science Day, and International Yoga Day were celebrated inside and outside the campus. Six workshops encapsulating various aspects in gender, agriculture and entrepreneurship for capacity building of stakeholders and institute staff were conducted. Two ICAR- sponsored short courses, one model training course and several farmers' trainings were conducted. Hindi pakwada was celebrated under the Rajbhasha activities. Logo for the institute was developed which was released on the eve of Foundation Day. Video conferencing facility was established in the institute.

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INTRODUCTION

Historical Perspective

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

Mission

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

Vision

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

Mandate of Institute

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

Objectives

- Undertake studies to assess agricultural technologies, programmes, institutions and policies to refine these with a gender perspective;

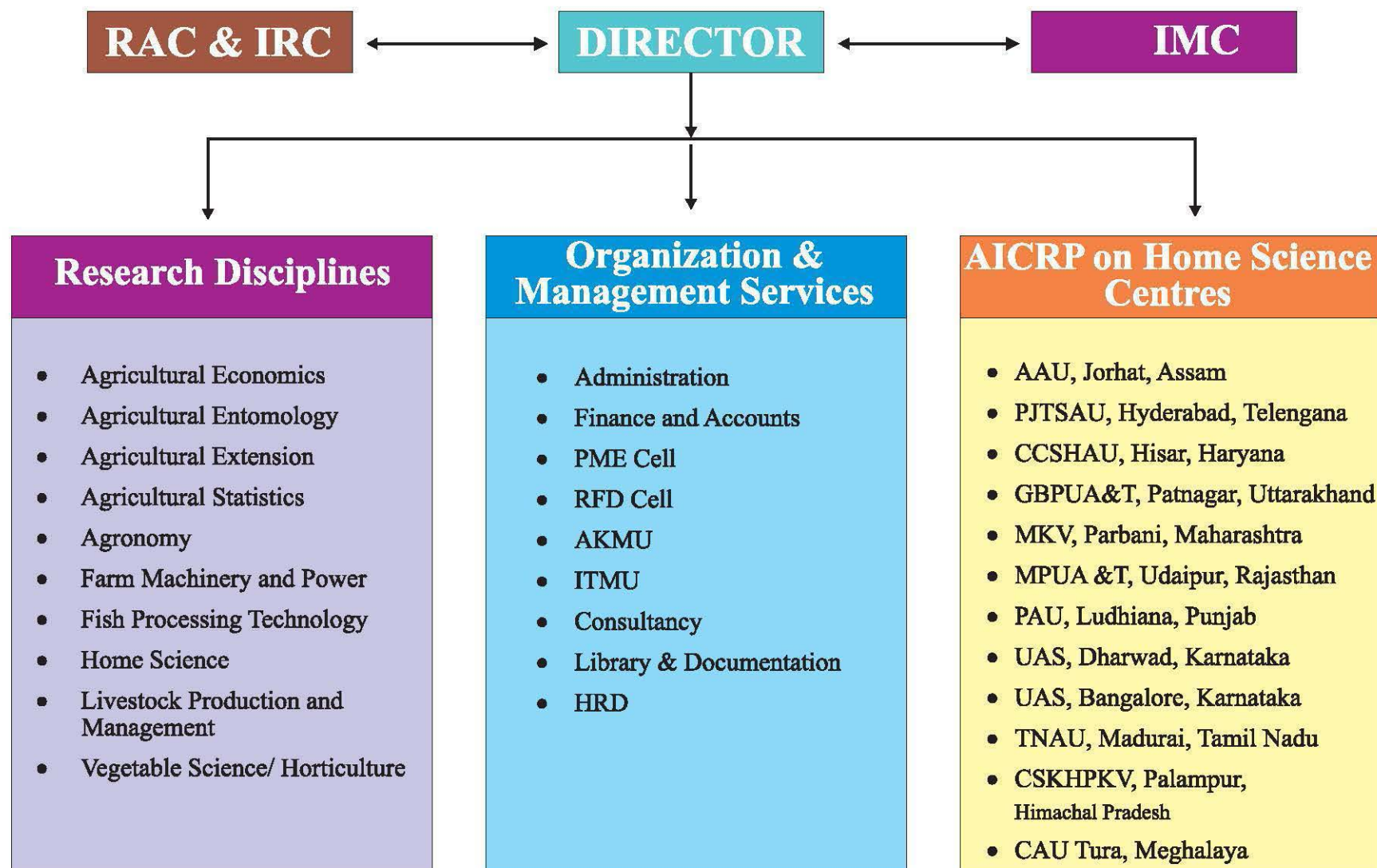
- Create and maintain gender disaggregated databases to understand the dynamics and the effect of gender roles in different agro-ecological and production systems for strategic planning;
- Characterize and understand drudgery and safety related issues of farmwomen and improve their work efficiency;
-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

Ongoing Activities of ICAR-CIWA

The ICAR-Central Institute for women in Agriculture serve as a unique Institute to address issues related to women in agriculture in the areas of integrated farming system, integrated pest management, drudgery, livestock and fisheries and extension methodologies. Empowerment of the women in agriculture is one of the key themes in the mandate of the institute right from its inception. Collaborative research projects were undertaken with the SAUs and ICAR Institutes for strengthening the research on women in agriculture and dissemination of women friendly technologies. Since women in agriculture is an emerging area of research, capacity building of all the stakeholders is being organized through various workshops, conferences, trainings and sensitization programmes for development functionaries, research scientists/managers, teachers and KVKs scientists/ SMS who are directly or indirectly associated with farm women empowerment.

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

Organogram



Infrastructure Facilities

- a) **Agricultural Knowledge Management Unit:** The Institute is having well developed Agricultural Knowledge Management Unit with facilities of internet and latest data analysis softwares like SAS and SPSS.

New website for ICAR-CIWA Bhubaneswar

The institute website was totally revamped and hosted for better visibility and efficient content management. It provides a new look and feel that is easy to use and numerous features have been added to enhance the user experience.

The newly designed website of ICAR-CIWA was launched by Dr. N. S. Rathore, Deputy Director General (Agriculture Education), ICAR during Foundation Day on 17 February, 2017. Hon'ble Secretary (DARE) & Director General (ICAR) Dr. Trilochan Mohapatra, New Delhi, Dr. A. K. Singh, Deputy Director General (Agriculture Extension), Dr. S. Pasupalak, Vice-Chancellor (OUAT, Bhubaneswar) also graced the occasion. It is available at the URL: <http://www.icar-ciwa.org.in>.

The site contains the information about manpower, institute mandate, staff profile, project details, Publications, Event Archives, tenders & job announcements etc. The report on events organized by the Institute, Staff recruitments, Tender notices, Forth coming Events and other circulars of the Institute are regularly uploaded in the Institute Website. Recent information will remain on the 'Home Page' and will be moved to 'Archive' after a period of one month.



Launching of the new website of ICAR-CIWA

- a) **Class Rooms:** The Institute has conference hall with seating capacity of 150 and two committee rooms with seating capacity of 40 each in addition to well equipped training hall and with the provision of LCD and other audio-visual aids.
- b) **Consortium for e-Resources in Agriculture (CeRA):** It is a web based application facilitating online access and sharing of journal literature subscribed by the participating libraries of the consortia. The facility of e-consortium of agricultural libraries is available in the Institute.
- c) **E-connectivity:** The whole institute is having round the clock broadband/optical fibre cable based internet connectivity over Local Area Network.
- d) **Gender Knowledge System:** It is the single window knowledge system on gender related information, databases, research, technologies, etc. in agriculture for the benefit of policy makers, researchers, development & extension workers, teachers and students.
- e) **Institute Farm:** In total 32 acre institutional area, 15 acre area under different horticultural & field crops as well as livestock & fisheries covering experiments under various disciplines is available at Institute. The Institute has well developed demonstration units for various agro-enterprises include horticulture based cropping models, vermicomposting unit, integrated fish-poultry-duck-unit and ornamental fish unit. Micro irrigation facility is expanded to 5 acres of land.
- f) **Institute Technology Management Unit:** There is an well developed Institute Technology Management Unit with necessary facilities for IPR and commercialization of institute technologies. This is attached to the PME Cell of the Institute.
- g) **Laboratory:** Well equipped laboratories in the field of entomology, ergonomics, post harvest technology, horticulture, seed technology, animal science, fisheries and gender data centre are available in the Institute.



- h) **Library:** The Institute has a well developed library having more than 2000 books/research journals/ CAB CD ROM Data base, Agricola data base. Twenty eight journals pertaining to gender, women and agricultural science are available the library. Six news papers including one daily news paper and two magazines in Raj Bhasha are subscribed. Library automation software with web OPAC is installed for easy retrieval and accessibility of books and journals in the library.



- i) **Training-cum-manufacturing Unit :** Training-cum-manufacturing unit has been established under the project Rastriya Krishi Vikash Yojna. Machines have been procured and installed in the unit the raw materials have been purchased for fabrication of women friendly farm tools and equipment is at the Institute is under progress.
- j) **Residential Quarters:** The institute has nine residential quarters in the campus consisting of Type-VI (1), Type-V (2), Type-IV (2), Type-III (2) & Type-II (2) quarters.
- k) **Trainees' Hostel:** Trainees' hostel is having two VIP rooms, seven air-conditioned rooms with 14 beds and one non-air-conditioned dormitory of 10 beds which are equipped with all the necessary facilities.
- n) **Video Conferencing System**

Video Conferencing System Facility has been established at ICAR-CIWA for having meetings and



conversations with different ICAR Institutes & the AICRP on Home Science Centers. It was inaugurated by the Honbl'e DDG, Education, ICAR, Dr. N. S. Rathore on July 28, 2016. System has multipoint HD video conferencing system which support IP connectivity. It have High Definition VC camera with high optical zoom supporting various formats, Microphone (3 Nos.), full HD professional display. It is installed at Director's Committee Room having capacity of about 30 Persons. IP Address of VC at ICAR-CIWA Bhubaneswar is 117.247.70.4.

Other Relevant information

ISO 9001:2008 Certification

The Institute was assessed for the purpose of ISO 9001:2008 Certification to (i) carry out basic, out basic, strategic and applied research, (ii) identify gender issues, (iii) test appropriateness of farm-technologies/ programmes/policies with women perspective, and (iv) conduct capacity building of stakeholders. After assessment for ISO certification, certification agency recommended that the Institute meets the certification requirements. Thus ISO 9001:2008 certificate was awarded to ICAR-DRWA by Vexil Business Process Services Private Limited w. e. f. 19 June, 2013. Further, accounting second surveillance assessment was conducted on 8 May, 2015 and the performance was found satisfactory with recommendations of continuation of ISO certificate.



The information pertaining to the staff strength, budget and expenditure and resource generation of ICAR-CIWA for the Year 2015-16 are given following:

Details of Cadre Strength as on 31.03.2017

Sl. No.	Category	Post	Sanctioned	Filled	Vacant
1.	Research Management Position	Director	1	1	0
		Head, Division of Agricultural Technologies for women	1	0	1
		Head, Division of Gender, Family and Community Studies	1	0	1
2.	Scientific Staff	Principal Scientist	3	1	2
		Senior Scientist	9	7	2
		Scientist	6	6	0
3.	Technical Staff	Senior Technical Officer	1	1	0
		Technical Assistant	11	10	1
		Technician	1	1	0
4.	Administrative Staff	Administrative Officer	1	1	0
		Assistant Administrative Officer	1	1	0
		Assistant Finance and Accounts Officer	1	1	0
		Private Secretary	1	1	0
		Personal Assistant	1	0	1
		Assistant	2	0	2
		Senior Clerk	1	1	0
		Stenographer Grade-III	1	1	0
		Junior Clerk	2	0	2
5.	Supporting Staff	Skilled Supporting Staff	1	1	0
Total			46		12

Total Budget and Expenditure during 2016-17 (ICAR-CIWA)

Sl. No.	Heads of Account	Plan (₹ in lakhs)			Non-plan (₹ in lakhs)		
		BE	RE	EXP	BE	RE	EXP
A.	Recurring						
1.	Establishment charges	10.00	5.00	4.95	360.00	381.00	380.96
2.	Overtime allowance	0.00	0.00	0.00	0.00	0.00	0.00
3.	Travelling allowance	29.00	18.00	17.41	3.00	3.00	2.47
4.	Contingency	326.00	227.00	226.73	26.00	26.00	25.89
5.	Human resource development	5.00	1.50	1.43	0.00	0.00	0.00
6.	Minor works	0.00	0.00	0.00	13.00	13.00	12.30
7.	Loans and advances	0.00	0.00	0.00	3.00	3.00	0.27
Sub-total (A)		370.00	251.50	250.52	405.00	426.00	421.89
B.	Non-Recurring						
8.	Equipment	20.00	19.95	19.94	3.00	3.00	2.98
9.	Furniture/Other	5.00	16.05	16.03	0.00	0.00	0.00
10.	Works	995.00	938.30	936.47	0.00	0.00	0.00
11.	Library	5.00	6.50	4.99	0.00	0.00	0.00
12.	Information technology	5.00	2.50	2.32	0.00	0.00	0.00
13.	Minor works	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total (B)		1030.00	983.30	979.75	3.00	3.00	2.98
Grand-total (A+B)		1400.00	1234.80	1230.27	408.00	429.00	424.87

Under All India Coordinated Research Project on Home Science				
Sl. No	Heads of Account	Plan (₹ in lakhs)		
		BE	RE	EXP
A.	Recurring			
1.	Establishment charges	1200.00	1200.00	1200.00
2.	Travelling allowance	20.00	26.50	26.10
3.	Recurring contingency	430.00	424.00	423.31
	Sub-total (A)	1650.00	1650.50	1649.41
B.	Non-Recurring			
4.	Non-recurring contingencies	50.00	9.50	8.81
	Sub-total (B)	50.00	9.50	8.81
	Grand-total (A+B)	1700.00	1660.00	1658.22

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

Revenue Generation ICAR-CIWA for the year 2016-17

Sl. No	HEAD OF ACCOUNT	Amount in Rs.
1.	Sale of farm produce	203596.00
2.	Sale of fish & poultry	5000.00
3.	License fee from Quarter & Trainees Hostel	282885.00
4.	Receipts from schemes (institutional charges)	356635.00
5.	Application fee from candidates	6220.00
6.	Diploma Charges/Registration fee	600.00
7.	Interest on loans /advances to employees	38608.00
8.	Interest earned on short term deposits	1721325.00
9.	Income generated from Internal Resource Generation Schemes	0.00
10.	Sale of Tender forms/tender fee	68000.00
11.	Receipt Electricity/Water Charges from Residential Quarter	210177.00
12.	Other (Penal interest/Misc. receipt)	67756.00
13.	Miscellaneous Receipts	0.00
	Grand Total	2960802.00

RESEARCH ACHIEVEMENTS

Project 1: Multi-sectoral Package of Practices for Nutrition and Livelihood Enhancement of Tribal Families

J. Charles Jeeva and Gayatri Moharana

The project was carried out with the objectives to document the gendered access to assets, resource base and researchable issues in the tribal eco-system, to assess and improve the nutritional status of tribal women and children and to facilitate capacity building and skill upgradation through need based and sustainable interventions for improving livelihood.

Nutritional Status of Tribal women and Children: Nutritional status of tribal women and children was assessed and improved their status through various interventions in health and nutrition of women and children were identified. Anthropometric parameters were measured to find the prevailing health status by analyzing body mass index of the respondents. Clinical symptoms of malnourishment were identified with the help of qualified medical practitioners. Dietary intake of women and children were assessed by 24 hours recall method. It was observed that women consumed more calories (rice, tubers, sugar etc.) than protein. They rarely consumed pulses, milk & milk products and fruits. They fed the children different types of locally available pulses, egg, fish, meat and green leafy vegetables. Most of the women never consumed animal protein (meat, egg etc.). The average weight of the mothers below 45 years of age was 43.5 kg. Pregnant & lactating mothers consumed nutrition supplements as it was freely available at Anganwadi Kendra. Indigineous technological knowledge and health care, medicinal value of plants and local food crops were documented. Awareness was also created for consuming balanced diet among women and children during various capacity building programmes. Improved variety of seeds of vegetables and green leaves were distributed to tribal families for establishing nutrition garden in their backyard and they were also motivated to continue these practices in their backyard. Improved cooking practices were disseminated for preservation of nutrients while cooking. Awareness was created on health & hygiene among tribal women and children.

Studies on knowledge, attitude and practices of woman revealed that during the prenatal stage, though they have the knowledge of care of pregnant mothers, only 30 per cent of them went for regular check up to hospital and took vaccinations. Nutrition supplement during pregnancy was provided by local anganwadi centres and all were benefitted. About 44 per cent of them preferred

to go to hospital for delivery. Thirty per cent of them feed colostrum to their new born baby for enhancing their immunity system. The gap can be bridged by motivating mothers. All of them followed immunization schedule for new natal baby provided by anganwadi centre or primary health centre. The knowledge, attitude and practices regarding importance of hygiene and sanitation in infant feeding and time schedule for feeding baby was very less and most of them didn't have knowledge of right schedule for weaning food and deworming. There was a need for trainings and awareness generation programmes, which were conducted accordingly for well being of the tribal families especially for mothers.

Scientists-Tribal Farm Families Interfaces: Three capacity building programmes and interfaces covering 160 tribal farm families in Gajapati and Mayurbhanj districts were organized during this period. A "Scientists-Tribal Farm Families Interface" and capacity building programme on sunflower as intercrops for additional income generation was organized at Village K.M. Bhaliasahi in R. Udayagiri block of Gajapati district on 12 January, 2017. On this occasion, hybrid sunflower seeds were also distributed to the participants. About 60 tribal farm families participated in the programme.



A nutrition education programme was organized at Village Tarajodi in Shamakhunta block of Mayurbhanj district on 25 January, 2017. On this occasion, french bean seeds were distributed to the farmers. About 50 tribal farm families participated in the programme. A "Scientists-Tribal Farm Families Interface and Awareness Programme on Commercial Horticulture" programme was organized at Village Tarajodi in Shamakhunta block of Mayurbhanj district on 18 February,



2017. Awareness was created on commercial horticulture and the need to shift towards commercial fruits and vegetables based on the market demands for additional income generation. On this occasion, hybrid seeds of water melon & bhendi and some drudgery reducing farm tools were distributed among the participants. About 50 tribal farm families participated in the programme.

Reducing drudgery of tribal women: Traditionally women dry the whole maize cob under sun. After proper drying of maize cob, they de-husk and shell the maize manually. This is a tedious/drudgery prone activity by which they could shell about 17 kg/hr from the properly dried cobs. This causes pain in upper and lower extremities, injuries in finger tips and wound in palms while de-husking. To reduce the drudgery of farm women, a women friendly sitting cum pedalling type maize dehusker-cum-sheller, developed by this Institute was introduced in the tribal village viz., K.M. Bhalia Shahi in Gajapati district. During the demonstrations, the output of de-husking cum de-shelling of maize was realized as 60kg/hr. This also helped to reduce injuries in palms and fingers.

The important findings have been summarized in the following table:

Issues Identified	Interventions	Salient Findings/ Impact
➤ Lack of scientific vegetable cultivation practices ➤ Need for quality planting materials	➤ 19 field level programmes covering 340 tribal farm families, for skill upgradation on improved methods of vegetable cultivation ➤ Stakeholder meetings for assessing the seed needs ➤ Input support programme by distributing mini kits of seeds ➤ Additional income generation through intercropping by 40 families ➤ Programme was organised for capacity building of 20 farm women on protected cultivation and 1 demonstration units on low cost poly house was established. ➤ Skill upgradation on improved methods of vegetable cultivation (40) ➤ Homestead nutrition gardens (40) ➤ Input support programme by distributing mini kits of seeds for vegetable cultivation (60) ➤ Advisory on the drudgery reducing implements (20) ➤ Nutrition education (60) ➤ Awareness on scientific and hygienic storage of food grains (60) ➤ Method demonstration of sunflower as intercrop in potato. Input support of Hybrid Sunflower seeds.	➤ About 10 per cent increase in mean annual gross family income (40,950 to 45,825) ➤ About 7 per cent increase in woman-days- Number of woman-days per year increased from 265 to 285 per year. ➤ An additional income of Rs. 8000/acre realized from sunflower as intercrop

Drudgery	➤ Demonstration of maize dehusker cum sheller ➤ Awareness creation on drudgery reducing farm tools and distribution of hampers of women -friendly farm tools (Khurpi, Vegetable cutter, Improved sickle, Hand cultivator, Ring cutter, Tubular maize sheller)	➤ Traditional/ Manual maize dehussing and shelling ○ Output: 17kg/hr ○ Pain in upper and lower extremities ○ Injuries in finger tips & wounds in palms ➤ DRWA Maize Dehusker-cum-Sheller ○ Output : 60 kg/hr ○ Reduces injuries in palms and fingers ○ Lesser fatigue ➤ Increased awareness (87%) of farmwomen on improved farm tools & equipments
Past harvest loss of food grains during flash floods	➤ Skill upgradation on scientific & hygienic storage of grains ➤ Distribution of metallic grain storage bins	➤ Perception index of 90 per cent as; ○ Loss due to insect/rat infestation minimized ○ Hygienic storage ○ Relatively safe during flooding ○ Effective pest management
Inadequate animal health care	➤ Organization of animal health camps ➤ Number of animals treated ○ Gajapati -750 ○ Mayurbhanj-550 ➤ Distribution of feed concentrates ➤ Vaccination and mass treatment	➤ Perception index of 73 per cent as; ○ Improved overall health status of animals ○ Free from parasitic infestations ○ Improved work efficiency of bullocks
Inadequate human health care/ Nutritional issues	➤ Assessment of nutritional status ➤ Anthropometric measurements ➤ Clinical examination ➤ Medical camps (2 Nos.) ➤ Nutrition education programmes (4 Nos.)	➤ Among the total children studied, 32.56 per cent were underweight, 39.53 per cent were stunted and 18.60 per cent showed thinness ➤ Improved awareness (76%) on the significance of consumption of nutritious vegetables, tubers and fruits available in their locale

Conclusion

Awareness was created on scientific and hygienic storage of food grains to prevent post harvest losses, with the use of metallic grain storage bins, the tribal farm families perceived effective storage without pest and rat attack. Upgraded the skills and knowledge of farm women on improved farm tools & equipments. Created awareness on the significance of consumption of location specific nutritious vegetables, tubers and fruits. By organizing animal health camps, the health status of animals improved significantly, which are their secondary source of livelihood.

Project 2: Engendering Millet based Value Chains for Promoting Livelihood Opportunities of Farmwomen in Selected States

J. Charles Jeeva and Abha Singh

The project was carried out with the objectives to examine and document the gender roles in finger millet based value chains in selected states, to study gender based constraints faced by women in existing finger millet value chains and identifying entry points for them and to strengthen the role of women in existing finger millet value chain by forming forward and backward linkages.

Strengthening the role of women in existing finger millet value chain: Scientists-Farmwomen interfaces for mobilizing women for establishing finger millet processing units were organized in two villages under Similiguda and Nandarpur blocks of Koraput district during 22-23 November, 2016. One cluster of three SHGs from Luhaba Maliput village in Koraput viz., Trinatha Bada Debatha, Udayanath Lukuma and Sarva Mangala was formed for establishing millet processing unit and forward linkage with traders. The farm women belong to Bhuiya tribe. Nearly 50 tribal families were engaged in ragi cultivation in this village, owning a land holding of 2-3 acres on an average. The productivity was found to be 2 to 3 qtls per acre, in upland. Fifty per cent of produce was retained for home consumption, rest marketed as grains at a cost of Rs. 15 to 20 per kg. where as in village level haats, the price of Ragi flour was found to be Rs. 30 per kg and in urban markets, ragi flour was Rs. 80 per kg. Another SHG viz., Maa Taarini (14 members) representing Barja tribe was formed in Muliaput village, where 20 families were exclusively doing ragi cultivation. Two millet processing units were established in the two tribal villages viz., Luhaba Maliput and Muliaput in Semiliguda and Nandapur blocks of Koraput district on 8 March, 2017, commemorating the occasion of International women's Day.

As part of the project, the gender roles in finger millet based value chains and the constraints faced by women in existing finger millet value chains were studied. During the study, it was observed that along the value chain, farmers, petty traders and labourers in processing units. Under this project, the possible entry points for women in finger millet value chain were identified, and the women SHGs in these two villages were mobilized

into two groups. They were provided with the machineries such as millet pulverizer, digital weighing machine, hot sealing machine for packaging and other raw materials such as polythene packaging materials to start the enterprise by making ragi flour. These machines had multifarious uses for processing other commodities like turmeric also. The units established can help the groups additional income of 50% due to value addition to ragi grains and packaging.



Unit established at the tribal village Muliaput



Unit established at the tribal village Luhaba Maliput

Change in value along the value chain : It was found from the study that, petty traders made a margin of 25 per cent, middlemen (50%), processor (33.33%) and retailer/wholesaler (10%) in ragi trading. However strengthening the role of women in the finger millet value chain, their margin could go upto 66% by eliminating the middle man.

Change in value along the ragi value chain

Actor	Petty seller (Haat)			Middlemen			Processor			Retailer/ Wholesaler		
	BP	SP	Change (%)	BP	SP	Change (%)	BP	SP	Change (%)	BP	SP	Change (%)
Ragi	12	15	25	10	15	50	15	20	33.33	20	22	10
Ragi flour							15	25	66.67			

(BP=Buying Price; SP=Selling Price)

Conclusion

The gender roles in finger millet based value chains and the constraints faced by women in existing finger millet value chains in Tamilnadu, Karnataka and Odisha have been documented in this study. In Odisha, along the value chain, women were found to work as farmers, petty traders and labourers in processing units. The possible entry points for women in finger millet value chain were identified at processing level. Two Millet Processing Units were established in Koraput district, with the involvement of two clusters of SHGs, which were mobilized for forward linkages. Strengthening their role

in the millet value chain could increase their income by 66% which improved their livelihood opportunities.

Project 3: Study on gender related indices in agriculture

Ananta Sarkar, H.K.Dash, Shivaji Dadabhau Argade

Empowerment in Crop Production Index (ECPI) has been developed under the project Study on gender related indices in agriculture . The index consists of four dimensions namely access to resources & services, decision making, participation and capability. The respective indicators under each dimension were finalised through detailed discussion with experts from

the relevant field and relevancy tests were done for each indicator. The validity of developed index was ascertained through Content Validity. A pilot survey was conducted to test the index developed. Data were collected from both farm women (37) and men (22) from Nimapada, Odisha to measure their empowerment in crop production activities.

Gender disaggregated data on ECPI and its 4 dimensions

	Access to resources & services	Decision making	Participation	Capability	ECPI
women	0.52	0.43	0.30	0.33	0.40
men	0.53	0.62	0.38	0.45	0.50
Overall	0.53	0.50	0.33	0.38	0.43
p-Value (W-M)	0.8524	0.0007	0.0677	0.0055	0.0007

The pilot study indicates that ECPI obtained for women (0.4) is significantly lower than men (0.5). Women are at par with men in the dimensions access to resources & services and in participation but are significantly less empowered in decision making and capability in Nimapada block. Overall empowerment in crop production was low (0.43) due to lack of access to crop loan/other facilities from banks, storage facilities to store farm produce, timely agricultural information, agricultural institution/groups, agricultural developmental schemes, lack of knowledge on new farming techniques etc. The farmers of the area were less empowered in all the four dimensions. Access to agricultural skill development training may increase their capability in agricultural activities.

Project 4: Outreach project on development and testing of institutional innovations for empowering women in agriculture:

Sabita Mishra, Ananta Sarkar, L. P. Sahoo, Gayatri Moharana and Shivaji D. Argade

For empowering women in agriculture there is need for gender sensitization among different stakeholders, through various sensitizing workshops, training programmes, interactive sessions and demonstrations. A workshop was organized on 1 August, 2016 for NGO functionaries (100) of Bolagarh block under Khordha district for gender sensitization. This could enable the stakeholders to develop gender sensitive programs and projects. Another workshop was organized on "Gender Responsive Budgeting" during 5-6 October, 2016 at ICAR-CIWA in collaboration with National Institute of Finance Management (NIFM), Haryana for sensitizing the stakeholders in different dimension of gender budgeting in which 45 participants from the Institute participated. For outreaching large number of stakeholders devoted for gender based developmental

activities, a Media Meet Workshop on Reaching Farm women through Media was organized on 4 January, 2017 where in 17 representatives from print & electronic media including community radio centres participated. different media were invited to highlight the research achievements of the institute.

Organization of Training cum Demonstrations: A training program was organized at ICAR-CIWA on "Manufacture of Jute Handicrafts" for farm women (15) during 17-22 October, 2016 with collaboration of ICAR-NIRJAFT, Kolkata with the aim of developing women entrepreneurship and their empowerment. Organized training cum demonstration of Oyster Mushroom cultivation on 23 December, 2016, 10 January, 2017 and 20 January, 2017 for 183 farm women. For capacity building of farm women in fruit and vegetable cultivation demonstrations were conducted and planting materials of Banana (G-9), Lime, Drumstick (PKM-1), Papaya (Red Lady), Palak and Amaranthus were distributed during January, 2017 among 2500 farm women. Demonstrated garden tools and equipments like hand hoe, hand cultivator, khurpi and rose can during February, 2017 for 480 farm women covering 20 adopted villages of the institute as a drudgery reducing drive.



Media Programs: A Community Radio Program was organized on 1 February, 2017 in Odia language on "Unnati Pathare Krushi Mahila" in collaboration with Indian Institute of Education and Care (IIMC) and Radio Surabhi which was broadcasted on 14 February, 2017 covering whole Odisha state through 12 Community Radio Centres, the first of its kind in India. The main theme of the initiative was women in Agriculture. Voice message was started as an outreaching strategy for



reaching farm women in collaboration with Reliance Foundation on the occasion of International women's Day on 8 March, 2017. Under this program, the agriculture related information are being disseminated from time to time through voice messages.

Documentation of Success story: Under the project, Smt. Mamata Mohanty aged 50 years of Sabalpur village of Sadar block under Cuttack district was one of the women beneficiaries. Under the project, she was facilitated to attend the capacity building programs on oyster mushroom cultivation organized by ICAR-CIWA. Being fully convinced with the technology, she established her unit with 65 beds of oyster mushroom and adopted all the scientific practices. After one and half month, she harvested 100 kg mushroom with an average yield of 1.5 kg/bed. With her hard work and sincerity, she could sell her produce at Rs. 80 per kg. and earned Rs. 8,000 with an investment of Rs.2,000 and profit of Rs. 6,000. Presently, she motivates and guides other women of her locality to adopt mushroom cultivation for enhancement of socio-economic status.

Development of gender sensitization instruments: Five checklists were developed for assessing Gender sensitivity of Working Environment, Gender sensitivity of Institutional Programs, Gender sensitivity of Extension



Methods, Gender sensitivity of Agricultural Technologies and Integrating Gender Perspective in Agricultural Extension Research Project. A brief description about the checklists are given below:

- **Gender sensitivity of Working Environment:** A positive work environment makes employees feel good about coming to work, and this provides the motivation to sustain them throughout the day and respect the organization's philosophy, mission and values. Gender sensitive working environment provides a safe and secure workplace for women staff which is free from sexual harassment/discrimination with leisure, health and hygiene and ensures justice. Therefore, this checklist will be used as reference while assessing the gender sensitive working

environment of ICAR and other institutions for supporting gender sensitive research. Further, this will provide opportunity for self gender sensitization among the staff on how to improve working environment by addressing gender.

- **Gender sensitivity of Institutional Programs:** Addressing issues and concerns of women through gender sensitive institutional R&D programs is the need of the hour. For making the programme gender sensitive, gender components should be incorporated in every major stages (planning, rapport building, execution and impact assessment) of institutional programme. Therefore, effort has been made to prepare a checklist to be used as reference while developing a programme and stage wise assessment can be made for self appraisal of gender sensitivity of the programme.
- **Gender sensitivity of Extension Methods:** Equal access to productive resources such as land & water, livestock, labour, modern inputs, technology, education, information and financial services is a critical determinant of agricultural productivity. This will be possible through only gender sensitive extension methods. This checklist is designed to identify gender concerns in all stages of programme implementation, so that the gender aspects can be addressed to the maximum extent.
- **Gender sensitivity of Agricultural Technologies:** Technology is essential to women's economic advancement, to increase their productivity, to create new entrepreneurial ventures and access new income-generating pursuits. Hence, women friendly technologies can be identified from the pool of technologies by considering few parameters while evaluating. So this checklist developed will help in relooking into the details of a technology through a gender lens for determining its women friendliness.
- **Integrating Gender Perspective in Agricultural Extension Research Project:** women are major producers of food, but they lag well behind men in ownership of land and access to other productive resources like credit, critical agricultural inputs, farm technologies, etc. This has resulted in low productivity of women operated farms. The under-representation of farm women's perspective in agricultural research makes the technology less useful for women led development. Extension research system also remain inattentive towards gender. Therefore, this checklist can be used as a planning guide for bringing gender perspective in new extension research projects, as a review procedure for the extension research projects in progress, and as a criterion for gender assessment of completed extension research projects.

Project 5 : Identification of gender issues in IPM and suitable intervention with women perspective

S. K. Srivastava, Naresh Babu and Sabita Mishra

Data on different factors viz. social, economical, physical and institutional factors affecting women participation in IPM have been collected from seven agro-climatic zones of Odisha. A data entry software has been developed using CsPro for compilation of the collected data which was further analyzed and interpreted for identification of factors affecting IPM with gender perspective. Indiscriminate use of pesticides, lack of awareness about the harmful consequence of insecticides on human health, lack of awareness and knowledge about IPM and injudicious use of pesticides, little faith in IPM, limited participation of women in IPM training and demonstration due to social constraints, lack of exposure of farm women to the new technology were some of the important gender issues identified in IPM. Per cent used as indicators of knowledge are determined from the numerical indicators according to KAP Manual FAO. Data collected from 434 farmers/farmwomen from 7 agro-climatic zone of Odisha showed that only 7.78 per cent of respondents were aware about IPM; 1.42 per cent of respondents were aware about resistant variety of brinjal; 14.62 per cent of respondents were aware about seed treatment; 2.59 per cent of respondents were aware about soil treatment; 51.89 per cent of respondents were aware about different forms of pesticides; 64.86 per cent of respondents were aware about pesticide hazards; 20.99 per cent of respondents were aware about vermicompost; 16.75 per cent of respondents were aware about predator insects; 4.95 per cent of respondents were aware about traps used for insect control and 7.55 per cent of respondents were aware about colour triangles on pesticides made on the container. Various scientists farmers interface and capacity building programmes were organised to increase the knowledge of farm women in IPM which increased the overall knowledge of farm women in IPM by 76.08 per cent at micro level in various villages of different agro-climatic zones of Odisha.

Data from Bargarh, Sundergarh, Malkangiri, Koraput, Kalahandi and Kandhamal showed that 81 per cent men and 62 per cent women of Malkangiri responded that social factors has no influence on women's participation in IPM. Sixty four per cent men and 54 per cent women of Koraput responded that social factors has no influence on women's participation in IPM. Twenty one per cent men and 26 per cent women of Kalahandi responded that social factors has no influence on women's participation in IPM. Eight per cent men and 12 per cent women of Baragarh responded that social factors has no influence on women's participation in IPM. Seventy two per cent men and 69 per cent women of Sundergarh

responded that social factors has no influence on women's participation in IPM. Sixty eight per cent men and 58 per cent women of Kandhamal responded that social factors has no influence on women's participation in IPM.

Fifty per cent men and 32 per cent women of Koraput responded that economic factors has high influence on women's participation in IPM. Twenty nine per cent men and 56 per cent women of Kalahandi responded that economic factors has high influence on women's participation in IPM. Eighty two per cent men and 74 per cent women of Malkangiri responded that economic factors has high influence on women's participation in IPM. Twelve per cent men and 27 per cent women of Baragarh responded that economic factors has high influence on women's participation in IPM. Seventy two per cent men and 63 per cent women of Sundergarh responded that economic factors has high influence on women's participation in IPM. Twenty six per cent men and 68 per cent women of Kandhamal responded that economic factors has high influence on women's participation in IPM.

Twenty two per cent men and 81 per cent women of Koraput responded that physical factors has very high influence on women's participation in IPM. Sixteen per cent men and 73 per cent women of Kalahandi responded that physical factors has very high influence on women's participation in IPM. Thirty two per cent men and 86 per cent women of Malkangiri responded that physical factors has very high influence on women's participation in IPM. Fourty seven per cent men and 62 per cent women of Baragarh responded that physical factors has very high influence on women's participation in IPM. Sixteen per cent men and 76 per cent women of Sundergarh responded that physical factors has very high influence on women's participation in IPM. Ten per cent men and 86 per cent women of Kandhamal responded that physical factors has very high influence on women's participation in IPM.

Concurrent demonstration and evaluation of IPM practices were taken of in the farmers field for bitter gourd and okra both these vegetables have high nutritional and therapeutic value for women. Evaluation of IPM practices was done with respect to machan system, a traditional method used by farm women and ground system using variety akash for pest management in bitter gourd (*Momordica charantia*). IPM practices like seed treatment with Bavistin & scheduled fertigation, rouging of plants, removal of infested plants, physical destruction of insects was effective for control of reduced the susceptibility of the plant against insect. *Aulacophora foveicollis*, *Bactrocera cucurbitae* and *Thrips palmi* by spraying of neem oil weekly and Imidachloprid fortnightly. Machan system was found beneficial to reduce flower shedding and recorded less incidence of



insect with increased size of the fruit. Average length/ width/ weight of fruit in machan system was 24.6 cm/4.8 cm/158.2 gm respectively while it was less in ground method as 21.5 cm/4.2 cm/151.2 gm respectively. Machan system showed higher yield (197.60 quintal/ha) in comparison to ground method (121.55 quintal/ha). Ridge & furrow system resistant hybrid variety of okra Yellow Vein Mosaic Virus for less insect incidence and higher yield. Fertigation schedule reduced the susceptibility of the plant against YVMV and insect. Yellow sticky trap was effective for sucking pests. YVMV affected plants were rouged out. Neem oil was sprayed at weekly interval while Imidachloprid at fortnightly interval before the initiation of fruit set stage. Average length/ width of fruit was 14.8 cm/1.7 cm respectively. An average yield of 128.05 quintal/ha was recorded. Management of these pests by IPM system is found eco-friendly and produce was free from the pesticidal hazards.

A gender oriented bio-intensive IPM model was tested in 4 villages of Dhenkanal district viz. Harekrushnapur, Koelpungi, Motari and Talagutha at farmers' field in which the farm women were first trained on the use of eco-friendly technologies. Ten farm families were identified for action research from these villages. Technological support in the form of Yellow Sticky trap, pheromone trap, pheromone lures, trichocard containing eggs of *Trichogramma chilonis*, neem oil and chlorpyrifos were provided to the identified farm

families as critical inputs. The farm families were asked to exclusively use these treatments for pest management with a sequence of package. Installation of pheromone trap followed by yellow sticky trap in the standing crop at the rate of eight traps per acre. At the time of flowering trichocard containing eggs of *Trichogramma chilonis* were released on weekly interval continuously for six weeks. Spraying of neem oil was made fortnightly during the action research period and spraying of chlorpyrifos was suggested to be sprayed only when pest incidence was found above economic threshold level.

Interventions of Bio intensive IPM were new. These



interventions were found to be profitable to the farmers and it also reduced the health hazards and drudgery of spraying. It gave better quality produce and better price in the market. An average B:C ratio for brinjal and tomato was calculated at 18.6 and 32.7 respectively including health benefits in Bio intensive IPM, while it was 1.4 and 7.82 respectively in the conventional system.

Outcomes of the implementation of IPM led to knowledge enhancement of the farmers and the farmwomen in eco-friendly pest management. Technological demonstration in their own farms led to enhance their confidence. The use of *Trichogramma chilonis* was beneficial in pest management. Another outcome was less investment in pest management. Most importantly there was sense of safety after using non hazardous options of pest management as it was safe not only for the human consumption but also for the livestock.

Details of scientists farmers interface organised in collaboration with the KVK are as follows:

Village	Block	District	No. of Farmers/ farmwomen participated	Technological support provided on
Luhaba Maliput	Semiliguda	Koraput	74	Yellow sticky traps
Dungri guda	Bhawani patna	Kalahandi	60	Yellow sticky traps
MV-3	Malkangiri	Malkangiri	70	Pheromone traps, Trouble gum
Nalichuan	Bhatli	Bargarh	90	Pheromone traps, Trouble gum
Khatangakudar	Bisra	Sundargarh	70	Pheromone traps, Trouble gum
Katadaganda	G. Udaygiri	Kandhamal	60	Pheromone traps, Trouble gum, Yellow sticky traps

Project 6 : Integrated farming system for improvement of nutrition and livelihood of farm women under different agro-ecosystems

S. K. Srivastava, Abha Singh, S. Tanuja

The project was implemented in six states with six different agro-ecosystems. The six collaborative centres were JNKVV, Jabalpur; ICAR-IIFSR, Meerut; ICAR Res Complex Patna; ICAR-CAZRI, Jodhpur; ICAR-CCARI, Goa



and ICAR-Central Institute for Women in Agriculture (CIWA), Bhubaneswar, Odisha. Lead centre has implemented the project at Dharamsala block in Jajpur district. Location specific farming system models were



developed to improve the household nutrition and livelihood security and reducing operational drudgery and implemented at the farmers field. Data was collected on gender issues on nutrition and livelihood security from one hundred households from two selected villages namely Sankharidiha and Dakhinisasan.

In the farming system models traditional bitter gourd variety was replaced with high yielding short duration variety Aakash and Sagar. Trailing and Machan system was implemented for higher yield. An average gross income of Rs. 8320 was recorded from 100 sq mt area. High yielding okra Samrat variety was introduced to enhance the availability of vegetables and nutrition status. An average gross income of Rs. 2990 was

recorded from 100 sq mt area. Green leafy vegetables viz; Green amaranth (*Amaranthus tritis*), Red amaranth



(*Amaranthus cruentus*), Vine spinach (Poi; *Basella alba*), slender amaranth (*Leutia saag*; *Amaranthus viridis*) and coriander (*Coriandrum sativum*) were introduced for kitchen garden. Banana- G9 and Banthala, papaya - Red lady and drumstick (*Moringa oleifera*) - hybrid seedlings were also provided to the farm women. Intervention of day old chick (Vanaraja) was given for additional income. Jute JRO 878 was introduced as additional source of income in low lying land. An average gross income of Rs. 45000 was obtained from 5000 sq mt area. Fish fingerlings viz; Catla, Rohu and Mrigal were also provided as a source of protein rich food and for increased income. Efforts were also made to reduce drudgery and improve health.

Terafil water filter, a low cost device developed by Institute of Mineral and Material Technology (IMMT), Council of Scientific and Industrial Research, Bhubaneswar was provided to cater to the needs for clean drinking water. Smokeless Chula, a low cost device was also provided to the selected farm families to cook in smokeless condition with reduced fuel consumption and pollution.



The five crop and poultry based integrated farming system models implemented are given below:

Sl. No	Name of the model	Area	No of families	Total income
1.	Crop+Vegetable+Jute	6040 sq mt	1	Rs. 57432/-
2.	Crop+Vegetable+Jute+Fruit	6040 sq mt	6	Rs. 57432/- excluding income of fruits
3.	Crop+Vegetable+Jute+Fruit+Poultry	6040 sq mt	4	Rs. 65432 /- excluding income of fruits
4.	Crop+Vegetable+Jute+Fruit+ Fish	6540 sq mt.	2	Rs. 57432 /- excluding income of fruits and fish
5.	Crop+Vegetable+Fruits+Jute+Fish+Poultry	6540 sq mt	7	Rs. 65432 /- excluding income of fruits and fish

Impact of climate change was assessed through interview of households and PRA.

Project 7 : Exploratory study on nutritional status of Nabarangpur district Odisha.

S. K. Srivastava, Gayatri Moharana, Ananta Sarkar, Korada Rajashekhara Rao and Archana Mukherjee

To assess the nutritional status in Nabarangpur district a survey tool was developed by incorporating nutritional related parameters, identification of gaps in people's knowledge, attitudes and dietary practices etc.

A scientist-farmers interface was organized on 12 August, 2016 at Sukhigan and Birigodou village under Umerikot block and Pandara pakhana village under Raigarh block of Nabarangpur district in which eighty five farmers including forty farmwomen participated. Planting material of Tapioca (Simli kand) and sweet potato (Kanda mul) were distributed among the selected participants.

Project 8: Development of Resource Efficient Horticulture Model for Livelihood Improvement of Rural Women

Naresh Babu, S.K. Srivastava and Abha Singh

Development of resource efficient horticulture model

To address the issue of livelihood security and nutritional security, a resource efficient horticulture model was developed with recent technologies such as drip irrigation and crop diversification to increase the income

of the farming community and generate employment opportunities.

The resource efficient horticulture model was developed in an area of 2000 m² with components like high density planting of banana, pineapple mulched with black polythene, meadow orcharding of guava, vegetable crops in open field and protected condition, and tuber crops in a period of four years. During the 4th year, the model provided 400 kg fruits (banana and guava), 300 kg green leafy vegetables (amaranth, coriander leaves, fenugreek leaves, palak and pudina), 300 kg roots and tuber (radish, elephant foot yam, colocasia, yam) and 1650 kg of other vegetables (bitter gourd, bottle gourd, cauliflower, okra tomato, brinjal, chilli, cowpea, French bean). Net income of Rs 46,700/ with B:C of 3.12 was estimated from this model.



Resource efficient horticulture model at ICAR -CIWA

Economic analysis of fruits and vegetable crops

Crops	Total area (m ²)	Yield (kg)	Total Expenditure (Rs.)	Gross Income (Rs.)	Net Income (Rs.)	B:C Ratio
Fruits	420	400	5,100.00	20,800.00	15,700.00	3.10
Vegetables						
Green leafy vegetables	185	300	900.00	7750.00	6850.00	3.20
Roots and tubers	195	300	1200.00	7800.00	6600.00	3.00
Other vegetables	860	1650	9200.00	26,750.00	17,550.00	3.12
Total	1660	2835	16,400.00	43,700.00	46,700.00	-

High density and meadow orcharding of guava model: Guava is the 6th most important fruit-crop of India, which is cultivated in subtropical and tropical climates. It has high nutritive value in terms of vitamin C and antioxidants. This crop is not cultivated commercially due to its low productivity per unit area. Considering the low productivity of crop/ unit area a high density and meadow orcharding of guava model was developed to obtain higher productivity with quality fruits per unit area. In this model production started from the first year of planting and the productivity was higher with superior fruit quality besides the ease of plant management. In this method, planting of guava accommodated 5000 plants /ha at 1.0 x 2.0 m spacing. The plant canopy was managed judiciously with regular pruning. An average yield of 26 t/ha was recorded which was higher (30%) over traditional planting system (400 plants/ ha spaced at 5x5 mt) during 4th year.

Coconut based multi-storey cropping model: Coconut is an important plantation crop grown in the coastal area of our country. Mostly coconut is grown as sole crop. Cultivating intercrops in coconut provide higher productivity and income per unit area. Suitable intercrops like banana, papaya and guava were evaluated in coconut based multistorey cropping model. Different vegetables like cowpea, turmeric, elephant foot yam, colocasia and pineapple were cultivated in the interspaces of the main crop as a ground storey crop. It was observed that among the different intercropping combinations, highest yield was recorded by colocasia var Muktakesi (240 q/ha), followed by turmeric (208 q/ha) and elephant foot yam (170q/ha). Highest income (Rs 3,42,000) was obtained with the combination of coconut + banana + colocasia var Muktakesi as compared to the sole crop of coconut (Rs. 1,50,000/ha).

Evaluation of different intercropping options with banana: Banana plantations are intercropped with ginger, turmeric, elephant foot yam and other vegetables to get more income per unit area and increase the space use efficiency. The advantages of intercrop are risk minimization, effective use of available resources, increased crop productivity and food security. Different intercropping i.e. cowpea, amaranth, elephant foot yam and radish in banana along with a control (Banana sole crop) were evaluated. Maximum income (Rs. 2,00,000/- per ha/year) was obtained from banana + elephant foot yam intercropping combination followed by banana + cowpea (Rs 1,80,000/-) as compared to control (Rs 1,40,000/-). Since the space between two banana row was wider, the interspace can be utilized by growing intercrop for additional income.

Drumstick based cropping system: Drumstick (*Moringa oleifera*) is an important multipurpose

vegetable grown widely in Odisha for nutrition purpose and have good local demand. Different intercropping options i.e. french bean, cow pea, amaranth, elephant foot yam and pineapple in drumsticks along with a control (drumstick sole crop) were evaluated. Among the intercrops, drumstick + French bean gave maximum fruit yield (4.35 kg) and yield per ha (45.50 t). Maximum



income (Rs165000/- per ha/year) could be earned from drumstick+ pineapple cropping system followed by drumstick+ elephant foot yam (Rs 130000/-).

Cropping of pumpkin and bottle gourd and okra for in different seasons: Highest yield 280 q/ha of pumpkin var Pusa Vikash and 78 q/ ha of okra var Versha Uphar were recorded during summer season and rainy season, respectively.

High value vegetables: Among high value vegetables broccoli, knol khol, cabbage, cauliflower and onion to increase the cropping intensity and productivity of the



model under drip irrigation during rabi season, cabbage var. Pusa Mukta and cauliflower var. Snow Ball gave highest yield (115 and 220 q/ha, respectively). Highest net return (Rs.54690/ha) was obtained under broccoli var Pusa KTS1.

Staking method of vegetable cultivation: Tomato

(indeterminate type), bitter melon and cowpea were grown under staking method and ridge melon was grown on pandals system. These climbers utilize this support, which protects the produce from soiling and increases exposure to sunlight and aeration, thereby increasing the number of flower buds, ultimately resulting in more fruit of superior size and quality. The yield was recorded as 35 t/ha by cultivating tomato with staking method, as against yield of 27 t/ha under the traditional method while yield of cow pea was recorded as 9t/ha with staking method against 6.5t/ha in traditional method. In bitter melon yield was recorded 26 t/ha under staking system as compared to 15 t/ha in traditional method of cultivation. In case of ridge melon the yield was recorded 25 t/ ha, with an average increase in yield of 17 t/ha as compared to normal method.

Effect of mulching in pineapple: Weed control in pineapple with mulching is a drudgery reducing option for women. Three different mulches like transparent polythene, black polythene and locally available Glyricidia leaves in pineapple variety Kew was evaluated. Observations revealed that black polythene mulch (200 gauge) was effective; as it recorded significantly higher fruit weight 1.70 kg/plant and water use efficiency with negligible weed growth than other mulches. Mulching with Glyricidia leaves (10 cm thickness) was also effective.

Performance of gladiolus varieties for flower yield: Performance of different varieties of gladiolus for flower yield was studied under climatic conditions of Odisha. Observations on days to emergence of spike revealed that maximum days to flowering was taken by White Prosperity (77) and minimum days to flowering were taken by Rose Supreme (65) and Pusa Kiran (68). Maximum floret were recorded in White Prosperity (21) followed by Nova Lux (19) whereas minimum (15) were



observed for Applause. Maximum spike length (84 cm) was produced by Nova Lux whereas minimum (61) was obtained by Rose Spire.

Effect of plant spacing on yield and quality of chrysanthemum: Chrysanthemum was studied with respect to size of flower and stalk length. It was found that the flower yield per ha was highest at 30 cm x 30 cm spacing which was at par with 30 cm x 40 cm spacing. The highest number of flowers per plant (46) was recorded at 60 cm x 60 cm level, which was significantly higher to plant spacing levels from 30 cm x 30 cm to 45 cm x 45 cm. Quality parameters, viz. mean flower diameter and hundred flower weight was similar in all spacing levels.

Project 9 : Livelihood and Nutritional Improvement of Tribal Farmwomen through Horticulture

Naresh Babu, J. Charlse Jeeva and L.P. Sahoo

Despite the fact that women produce much of the food in the developing world, more than 50 per cent remain malnourished. Horticulture can play a vital role in making women economically active and in countering malnutrition, since this sector possesses greater scope for diversification. This project was carried out with the objectives to assess gender roles in different horticultural production systems, formulation of sustainable horticultural production system for livelihood and nutritional improvement of farm women,



and to develop the skill of farm families through capacity building programmes and action research. The project was implemented at ICAR-CIWA, Bhubaneswar as the lead centre and with four collaborating centres viz., ICAR-Central Arid Zone Research Institute at Pali, ICAR-Indian Institute of Vegetable Research at Varanasi, ICAR-Central Institute of Temperate Horticulture at Mukteshwar and ICAR- National Research Centre on Litchi at Muzaffarpur.

Scientists-Farmers Interface Meetings were organized in two tribal villages of Dhenkanal district in Odisha on 23rd August, 2016. The first interface was organized at Village Kamaninga in Dhenkanal district, in which the farming communities were sensitized about the latest technologies in vegetable production. The meeting was followed by frontline demonstration of raising vegetable

seedlings using protrays. Tissue cultured banana seedlings, improved/hybrid seeds of vegetable crops such as brinjal, okra, chilli, bitter gourd, pumpkin and ridge gourd, cluster bean, cowpea and inputs such as protrays and cocopith were distributed to 30 tribal farm families for vegetable cultivation in their landholding.

Another interface was organized at Village Majhisahi in Dhenkanal district, in which 30 tribal farm families participated, and benefitted through the distribution of high quality vegetable seeds for livelihood support, such as improved/ hybrid seeds of brinjal, okra, chilli, bitter gourd, pumpkin, cluster bean, cowpea and ridge gourd, and inputs such as protrays and cocopith. In both the programmes, the farmers were imparted knowledge and skill on improved methods of vegetable cultivation, and technical advisories were given on constraints pertaining to vegetable cultivation. They were also educated about the cost effective technologies for

quality production of vegetables and highlighted the importance of nutrition for their families.



The major achievements accomplished under the project were replacement of existing varieties with high yielding varieties in both main field and homestead land and seeds of improved varieties of vegetables such as brinjal, tomato, chilli, okra, bitter gourd, pumpkin, ridge gourd, cluster beans and cowpea were distributed to the stakeholders. Improved nursery raising methods was introduced like raising seedlings in protray using cocopith and improved vegetable cultivation method

like raised bed method and staking method Knowledge and skill were imparted on improved package and practices of vegetable cultivation to 150 farm women of three villages of Dhenkanal district through capacity building programmes on improved varieties, seedling raising of vegetable crops, seed treatment, and improved method of vegetable cultivation. The horticulture technological interventions resulted in increased income of farm family by about 34 per cent.

**Summary of the activities undertaken and the impact under the project
(n=150 households)**

Sl. No.	Issues Identified	Interventions Proposed	Interventions/ Technologies adopted	Perceived Technological Impact	Impact (Nutritional Status)		Impact (Livelihood security)		Impact (Family Income from farming)	
					Pre	Post	Pre	Post	Pre	Post
1.	- Damage of vegetable seedlings due to stray cattle, poultry birds, adverse weather such as heavy rains - Unhealthy seedlings - Pest and disease incidence	- Raising seedlings in low cost net houses - Raising seedlings using protray and cocopth	- Raising seedlings in low cost net houses- Vegetables such as tomato, cauli flower, and coriander raised under net houses (Adoption = 20%) - Raising seedlings using protrays (Adoption = 40%)	- Reduced pest and disease incidence - Healthy seedlings; uniform growth - Easy plucking of seedlings; no damage during transplanting - During adverse weather such as heavy rains, the protrays can be shifted to safer places - Less seed cost; 100% germination; no seed is wasted (Impact index= 86%)	3.26 (Mean score on frequency of Intake of seasonal vegetables, pulses and leafy vegetables)	3.55	1.65 (Mean score on livelihood security scale)	2.06	28,200	37,820
2.	Poor quality of seeds	Awareness/ Input support with HYV and hybrid seeds	Use of HYV/ Hybrids (Adoption = 40%)							
3.	Lack of improve d method of vegetable cultivation	Trailing method of vegetable cultivation(tomato, cucumber and bitter gourd)	(Adoption = 56%)							
4.	Water logging during rainy season-pest and disease incidence	Raised bed method of vegetable cultivation	(Adoption = 64%)	Reduced pest and disease incidence (Impact index= 63%)						
5.	Traditional cropping systems	Innovative/ modified cropping systems	- Introduced legume vegetables (beans, cowpea, cluster bean) - Introduction of leafy vegetables (Palak, Methi) - Introduced tissue culture banana	- Improved soil fertility - Improved family Income - Addressing nutritional issues - Addressed Iron deficiency - For both home consumption and Income generation (Impact Index= 54%)						
6.	Mandays in farming			Increased man days/ employment (20 days/ month to 25 days per month; 25% increase in man days) - Due to increased cropping intensity and innovative cropping systems; Reduced migration to non -farm activities (perceived impact index: 36%)						

ICAR-Central Arid Zone Research Institute (ICAR-CAZRI) Regional Research Station, Pali

Gender Roles in Horticultural Production/ Processing: Gender roles in horticultural production/ processing were assessed using the schedule having the listing of various activities and participation and responsibility/decision making by the gender. In selected villages, operations like land preparation (70.0%), manure applications (95.0%), sowing of seeds for rootstocks (95.0%), selection of crops (100%), procurement of plants (100%), and marketing of fresh produces(100%) etc. has found dominance of male participation/responsibility/decision making while operations like ploughing (100%), clod breaking (100%), levelling (85.0%), planting (95.0%), weeding (95.0%), intercultural operations (95.0%), planting of intercrops (85.0%), insect-pest control by traditional methods (70.0%) and harvesting (100%) etc. were jointly performed.

Food habits/nutritional status of tribal farm women

The survey among the sampled tribal farmwomen for finding out food habits/nutritional status in selected village revealed that Roti was consumed daily by all (100%) respondents, while rice was consumed very rarely by half of the respondents (50.0%), followed by once in a week (30.0%). Dal was part of daily food for 3/4th majority (75.0%), while 1/4th consumed for 4/5 days in a week. Leafy vegetables were consumed by majority (60.0%) for 2/3 day in a week, while seasonal vegetables consumed by most (90.0%) for 4/5 days a week. Seasonal fruits are consumed weekly/monthly by 1/3rd respondents. Milk was part of daily food for 40.0 per cent and 50.0 per cent took it for 4/5 days in a week. Egg was consumed by 50.0 per cent once in a week, while chicken/mutton 2/3 days in a week by 40.0 per cent and once in a week by 30.0 per cent.

Screening of horti-based model for nutritional and livelihood security : Cultivation of vegetables & fruits



Guava meadow orchard

not only generate income and ensures livelihood but also ensures nutritional security of tribal farmwomen. Cultivation of arid fruits like guava (as meadow orchard) and Cardia were screened for field intervention. Similarly, cultivation of vegetables like tomato, cauliflower and cucumber were screened under low cost shed net.



Cardia orchard



Chrysanthemum cultivation



Marigold cultivation

Demonstration of backyard nutritional garden

To demonstrate the backyard nutritional garden, seeds of improved varieties of Rabi season vegetable crops was distributed as critical input. The varieties were distributed among 20 farm women and included Delichos bean (cv. HADB 119), Faba bean (cv. Swarnasafal), French bean (cv. HAFB-4), Chilles (cv. SwarnaPradhulya), Pea (cv. SwarnaMukti), Tomato (cv. SwarnaLalima), Brinjal (cv. SwarnaPratibha and SwarnaShyamali). The performance of these crops were found satisfactory in the backyard nutritional garden of tribal farmwomen and has been contributed in food basket of the family and ultimately in the improvement of nutrition and nutritional security of the tribal family.



Performance of improved seeds of vegetables in 'Backyard Nutritional Garden', village Peepla, Dist.- Pali

ICAR- Indian Institute of Vegetable Research, Varanasi

In the year 2016-17, apart from promoting kitchen garden at door step, front line demonstrations were conducted for bottle gourd (Kashi Ganga), sponge gourd (Kashi Divya), pumpkin (Kashi Harit), okra (Kashi Pragati), cowpea (Kashi Kanchan), tomato (Kashi Aman), brinjal (Kashi Komal), chilli (Kashi Anmol) and pea (Kashi Nandini) in an area of 117.6 acre which helped to boost their nutritional and livelihood security. Since, water was a major constraint in the region, farm women were trained to conserve rain water for life saving irrigation in

vegetables. Major focus was given for kitchen garden development so that the tribal families could get vegetables for their daily diet. Besides, five training programmes were organized on vegetables for health and income, improved vegetable production technique, organic manuring and vermi compost production through vegetable waste etc.



Demonstration of Sponge gourd var. Kashi Divya in the kitchen garden of Hirawati Devi



Seed production of Sponge gourd var. Kashi Divya

Case studies

Livelihood and nutritional security among tribal women in sonbhadra

ICAR-Indian Institute of Vegetable Research, Varanasi adopted 3 villages with 100 tribal women in Chopan block of Duddhi tehsil in district Sonbhadra. Front Line Demonstrations on vegetables (FLDs) were conducted at selected tribals' fields for dissemination and adoption of improved vegetable varieties by the tribal farm women. As a part of integrated support, technology intervention through kitchen gardening were also made among selected beneficiaries to ensure their livelihood and nutritional security. In a series of demonstrations, regular field visits and need based advisory services were provided to make their farming system sustainable.

Table: Vegetable crops with better performance at farmers field

Sl. No.	Name of the farmer	Village	Crops
1.	Hirawati Devi	Bhalukudar	Spongegourd
2.	Sonmati	Satdwari	Spongegourd
3.	Malti	Satdwari	Spongegourd Bottlegourd
4.	Savita Devi	Kekrahvakhadi	Bottlegourd Spongegourd
5.	Basmati	Kekrahvakhadi	Bottlegourd Spongegourd Cowpea Okra Tomato Brinjal Chilli

The bumper yield harvested in demonstrated vegetable field resulted in satisfaction about the introduced vegetable varieties among the farmers. Farmers used the vegetables for household consumption and sold the excess produce in nearby market. An average yield of 80 q/ha in case of cowpea var. Kashi Kanchan and 45 q/ha okra var. Kashi Pragati was recorded in tribals field under mostly undulated hilly and water scarce area. By and large, the farmers gained monetary benefits in terms of improving the productivity of vegetable crops as well as improved the nutrition standards by daily vegetable based dietary intake.



Demonstration of Brinjal var. Kashi Taru and Chilli var. Kashi Anmol in the kitchen garden of Sonmati



Demonstration of Sponge gourd var Kashi Divya in the kitchen garden of Hirawati Devi.

It was concluded that

- Better nutritional security in terms of vegetable availability throughout the year can be achieved through improved cultivation practices.
- Better income security can be ensured by earning Rs. 1200-1500 in a cropping season by selling the additional vegetables produced after home consumption.
- Gender sensitization and empowerment of tribal farm women.

ICAR-NATIONAL RESEARCH CENTRE ON LITCHI, MUZAFFARPUR

On the basis of interaction with tribal women, 60 women farmers were selected and base line survey of both the village and selected beneficiaries was done. Kitchen garden kit containing seeds of summer vegetables viz. Cowpea (Kashi Kanchan/Nidhi), Bottle gourd (Kashi Ganga), Pumpkin (Kashi Harit), Okra (Kashi Pragati) were distributed to the selected tribal women.



Performance of different vegetables at farmers' field in Bakawa village

Crop	Variety	Season	Average Plot size (Square meter)	Yield (kg)	Income (Rs)
Bottle gourd	Kashi Ganga	Summer	150-275	225-662	1250-4000
Pumpkin	Kashi Harit	Summer	150-250	200-525	600-1740
Okra	Kashi Pragati	Summer	100-250	90-175	650-1325
Cowpea	Kashi Kanchan/Nidhi	Rainy	150-300	85-150	450-925

Performance of different vegetables at farmers' field in Parsauni village

Crop	Variety	Season	Average Plot size (Square meter)	Yield (kg)	Income (Rs)
Bottle gourd	Kashi Ganga	Summer	250-350	475-825	2550-4200
Pumpkin	Kashi Harit	Summer	200-300	200-600	1600-2400
Okra	Kashi Pragati	Summer	175-250	150-225	975-1125
Cowpea	Kashi Kanchan/Nidhi	Rainy	300-500	100-300	750-1250

ICAR-Central Institute of Temperate Horticulture, Regional Station, Mukteshwar

Two village namely Nithila in Dehradun District and Mathyau in Chakrata were selected under the project for implementing the activities of the project to improve livelihood and nutritional security of tribal Farmwomen through Horticulture.

Nithila Village

In Nithila village there are five major tribal groups consisting of 30 farm families of which 70 per cent are women headed. About 30 per cent females are 10th pass

whereas 10th pass males are 50 per cent, but only 10 per cent young populace were graduate. The sex ratio in the village was high and their annual income was around Rs. 70 to 80 thousand per annum. Generally, farmers grow tomato, cabbage, potato, cucumber, bitter gourd, pea, maize, ginger, beans, garlic, onion, rice, oat and wheat, however very limited number of pear, peach, plum, apricot and walnut plants were also there. In the valley area, farmers had planted mango, litchi, pomegranate, etc. some farmers also reared animals in limited numbers viz., goat, buffalo, sheep and cows, besides poultry.

Technologies demonstrated on fruits and vegetable crops in village Nithila

Sl.	Particulars/Technology	Variety	No. of plants/seed supplied	No. of farmer's benefited
1	Scientific cultivation of Apple	CITH-Lodh Sel-1, Chubattiya Anupam, Chubattiya Princess, Golden Delicious	20	4
2	Scientific cultivation of Apricot	Morpakh, CITH-A-3,	10	2
3	Scientific cultivation of Peach	Red June	10	2
4	Scientific cultivation of Plum	Santa Rosa	10	2
5	Scientific cultivation of Kiwi	Tomury, Bruno, Hayward, Monty	27	5
6	Technology demonstration for the planting/sowing methods of the Tomato	VL-4	250 g	5
7	Scientific cultivation of Capsicum	California Wonder	250 g	5

Mathyau Village

In Mathyau village, there was only one tribal group consisting of 26 farm families of which 40 per cent are women headed. Generally, farmers grow tomato,

cabbage, cauliflower, potato, cucumber, bitter gourd, pumpkin, bottle gourd, pea, maize, ginger, beans, garlic, onion, rice, oat and wheat, however limited number of peach and plum plants were also there. In valley area, farmers have planted Pomegranate and Guava.



Technology/Crop/variety demonstrated in Mathyau village

Village- Mathyau				
S.No.	Crops/ Particulars/Technology	Variety	Seed (g) supplied	No. of farmer's benefited
1	Technology demonstration of production technology of Tomato	VL-4	250g	5
2	Technology demonstration of production technology of Capsicum	California Wonder	250g	5
3	Technology demonstration of production technology of Been		2kg	10

Extension Programmes/activities conducted

Date	Programmes/activities	Beneficiaries
22 Oct, 2016	Conducted FAP-training programme at Nithila village.	24
22 - 23 Jan, 2017	Conducted FAP -training programme in Mathyau and Nithila villages	27 and 13

During the programmes awareness on following fields were also created in both the villages

- Farmer's awareness program on the importance and prospects of horticulture.
- Created awareness on protected cultivation techniques of vegetables (tomato, capsicum, cucumber, pea), high value vegetables (broccoli, lettuce, red cabbage), and flowers (gerbera, chrysanthemum).
- Demonstration on senile orchards rejuvenation techniques.
- Introduced high density planting system in

temperate fruit crops like peach, plum, apricot etc.

- Introduction and demonstration of kiwi-fruit production techniques.
- Awareness among the farmers about the use of micronutrients for better production and quality of the produce.
- Awareness about rain water harvesting and micro irrigation for irrigation during dry months.
- Awareness created on scientific nursery and seed production in vegetable crops

Project 10: Improving availability of quality pulse seed with participation of women

Laxmi Priya Sahoo, Jatinder Kishtwaria, Santosh Kumar Srivastav, M. Chaitrali Shashank and Ankita saho

The project was started with the objectives of studying the factors associated with women participation in pulse seed production and management, involving farm women in seed production of green gram (*Vigna radiata*) and black gram (*Vigna mungo*) in participatory mode, improving the quality of pulse seeds through scientific seed processing, storage and treatment and to standardize a model for sustainable pulse seed production involving women.

Production of pulses in India is far below our requirement. Looking to the cultivation practices and effect on soil, pulses can be considered as the most suitable crop for maintaining the health of man and soil. However, pulses suffer from various constraints due to subsistence farming, low productivity, difficult storage and poor adoption of improved varieties. Lack of comprehensive testing of improved varieties and less availability of quality seed is the greatest problem. In rice based production system of Odisha short duration pulses like blackgram and greengram are grown in rice fallow using residual moisture. Women are mostly involved in interculture, harvesting and post harvest operation in these crops. In Nayagarh district of Odisha two local varieties named Nayagarh local black and green occupy nearly 80% of area. This variety is a good storer compared to common high yielding variety PUSA 9072 and have more local demand. However PUSA 9072 far exceeds the local in yield. So for increasing availability of both local and improved variety seeds, involvement of farmwomen in processing and storage of seeds is important. The present project focuses on increasing seed availability by capacity building of farmwomen.

Green gram (*Vigna radiata*) and Black gram (*Vigna mungo*) are traditionally grown in the locality. Local varieties occupy more than 75% of the total area under these pulses. In rest of the area improved cultivars are cultivated. Farm women play important role in pulse production. However their role is more prominent in post harvest activities like processing and storing of seeds and grains. The project was taken up in 2 villages of Nayagarh District. Baseline survey was conducted for understanding the scope and constraints of pulse production in the study area.

Facilitating factors in villages favouring sustainable green gram production (N=30)

Sl. No	Factors	Percentage	Rank
1	Green Gram is traditionally grown	83.3	III
2	Use of good local varieties	66.6	V
3	Seed availability due to farmers seed network	90	II
4	Good market demand for local varieties	70	IV
5	Involvement of women in post harvest processing and storage of both seeds and grains	100	I
6	Lands nearby house	60	VI

Challenges in Farmer's Seed Network

Factors	Effect			
	Skill	Practice	Motivation	Economy
Discontinuation of pulse cultivation	xx	xxxx	xxx	x
Loss of skill in seed production and handling	xxx	xxxx	xx	xx
Change in Socio cultural values	xxxx	xxxx	xx	x
Inferior status to farmer saved seed	xx	xx	xxx	xx
Less or no attempt to upgrade skill of farmers	xxxxx	xxxx	xxx	xxx
No Institutional Mechanism for strengthening farmers seed network	xx	xx	x	xxxxx
No processing or storage facility	xx	xx	xxxx	xxxxx

Project 11 : Empowerment of farm women through livestock technologies

Anil Kumar, B. Sahoo, Tanuja, S. and Shivaji, D.A.

Livestock rearing has emerged as an important tool for increasing household income in the rural areas. It can easily be integrated with the primary crop production activities. The types of livestock species reared by farm household depends on the preference of the household about a particular livestock species / poultry, access to information and capacity building programmes, credit facilities among others. Technological empowerment of farm women in livestock sector can play an important role in improving the productivity of the animals/ birds reared by them. It has also been established that the households rearing dairy animals and birds have better nutrition outcomes in the farm households besides supplementing the income. This project aimed at identifying the technological gap in rearing of livestock species by farm women in different locations of the country and the impact of technological interventions on household income and productivity of animals. The project was implemented at five locations in the country namely, ICAR-CIWA, Bhubaneswar; ICAR-RC-NEH region, Barapani; ICAR-NDRI, Karnal and ICAR-IGFRI, Jhansi. The activities undertaken at different centres are given below.

ICAR-Central Institute for Women in Agriculture : In the east coast region of India, the dietary preference of population is towards non-vegetarian food. Traditionally, this used to be met through the supply of fishes from sea and inland aquaculture. The region is also known for intensive paddy cultivation and the farmers now want to diversify into complementary livestock based enterprises with dairy being preferred. This desire to take up dairy by the farmers has also come up because of the enabling policies in dairy sector by the State government besides setting up of milk processing plants by the private industries in the vicinity. In addition to dairy, backyard poultry has been the companion bird especially reared by the people from the lower strata of the society. In spite of the nascent enthusiasm of the populace towards the vocation of dairy, the cultural lag of this society in not having a traditional foundation of the culture of livestock rearing for milk productions, the productivity of dairy animals is low. The animals are hardly stall fed and the use of feed mangers are virtually nonexistent. The project aimed to identify the technological gaps in the rearing of dairy animals and backyard poultry in the coastal region of Odisha. Two villages, namely, Alapur and Chamarpada of Puri and Cuttack district, respectively were selected for the study. The problems in livestock sector constraining productivity of animals were identified through PRA and focussed group discussion. The socio-economic

condition of women livestock owners and their role in various activities in livestock management were studied through semi-structured questionnaire. The socio economic profile of 30 households in each village was studied which showed that 75% were male headed family and 100% of them belong to Hindu community having joint family. Most of them belonged to SC (50%), followed by OBC (43%), general (5%) and 2% ST community. Based on the survey report, it was revealed that marketing facilities, resource, financial, technological and environmental constraints were the major problems of farm women in the rural areas. The Knowledge Attitude and Practice (KAP) of the studied area revealed that farm women had knowledge (70-90%) and attitude (70-90%) in dairy farming and goat rearing. However, they had less knowledge (50-80%) in scientific poultry farming despite their keen interest in poultry rearing (70-80%). In the dairy sector, fodder scarcity was the major limitation followed by lack of awareness about various forage species for feeding of livestock and inadequate service of veterinary and animal husbandry sector. Most of the women farmers of poor economic condition showed keen interest for backyard poultry farming. However, women of socially improved condition were interested for dairy farming. Based on the needs of the farm women in the two villages, technological interventions in dairy sector and backyard poultry were initiated. Forty farm women (20 each) in the two villages were provided with improved backyard poultry, *Vanaraja*. Capacity building of the farm women in scientific management of backyard poultry was undertaken by ICAR-CIWA and farm women were explained the importance of backyard poultry for self employment, making low cost poultry feed for improved productivity, health management and vaccination schedule of poultry birds, importance of backyard poultry on household nutrition, government policies and programmes in poultry sector, etc. during the training programme. The farm women were also given hands on training on preparation of balanced feed for poultry.

A total of 1767 dual purpose coloured bird of *Vanaraja* variety, 783 in Alapur and 984 in Chamarpada were distributed to 20 selected farm women in each village in 4 phases. A model low cost poultry house was designed and constructed by using locally available bamboo and paddy straws. Paddy husk was used as litter material. The birds were reared on scavenging feeding based on kitchen waste and growth rate was recorded at fortnightly interval. Proper housing, feeding and disease management of birds led to early maturity (1.9 kg in 3 months) and first egg lay (at 21 weeks of age). Women in village were able to sell egg @ Rs 8/- per egg. Average gross income of a beneficiary was calculated to be Rs. 13700/- in 6 months period rearing 15 birds. Income

from poultry rearing were utilized towards education of their children, purchase of inputs for agricultural activities, construction of low cost poultry house and procurement of feed for poultry etc. One self help group named *Maa Patarani Kukuda Utpadak Gosthi* was formed consisting of 20 women poultry keepers in Alapur village and the farm women benefited by the same through technology dissemination and promotion of low cost poultry rearing in farmers' field.

Cultivation of green fodder was nonexistent in the rural areas of Odisha. Feeding of dairy animals was based on dry paddy straw and concentrate mixture. Therefore, green fodder such as hybrid napier was introduced in the fields of 10 women livestock keepers in each village and their impact on milk yield was assessed. By feeding the perennial fodder, farm women were able to save expenditure on purchasing concentrate mixture and augment milk production by 12-15%. Two farm women one in each village named Mrs. Urmila Beura in Alapur village and Mrs. Kunjalata Sahoo in Chamarpada village successfully adopted the propagation of fodder especially hybrid napier on a large scale in their field which inspired other women to start planting the perennial fodder for feeding dairy cows.

Rural farmers especially women usually feed homemade concentrate devoid of mineral mixture imbalanced with energy, protein, mineral and vitamins which adversely affect the health and productivity of the animals and hence the economic return. Farm animals derive their mineral requirements mainly from feedstuffs offered to them as use of mineral mixtures to supplement diet is almost non-existent under the field condition. Keeping aside the economic constraints, there also exists lack of awareness regarding the positive impacts of mineral supplementation in terms of enhanced productivity. Therefore, a study was designed to assess the effect of supplemental mineral mixture along with the conventional diet in lactating crossbred cows. An on farm trial was conducted at farmers' field in the adopted village of Alapur, Puri and Chamarpada of Cuttack district in coastal belt of Odisha to assess the effect of supplemental mineral mixture on productive performance of lactating cows. Twenty milch cows were randomly divided into 2 groups (T_1 , control and T_2 , treatment) of 10 each based on body weight (450 ± 12.75 kg) and milk yield (7.5 ± 0.25 kg). Animals were fed on homemade concentrate mixture comprising locally available maize, soybean cake, rice bran. Paddy straw provided *ad libitum* to the animals satisfying the nutrient requirement (ICAR 1998). Animals in group T_2 were additionally supplemented with a commercial grade mineral mixture @ 2% in concentrate mixture. A

digestibility trial of 6 days was conducted at the end of the experiment. The representative samples of feed, residues were analyzed following AOAC (2000). DM intake, milk yield, milk composition were recorded at fortnight intervals in a 3 month lactation trial. Daily dry matter intake was similar in both the treatments. Milk yield, fat corrected milk (FCM) yield and milk composition were higher ($P < 0.05$) in T_2 compared to the control T_1 . Results showed that feed intake was similar in both the groups. Digestibility of nutrients viz. DM, OM, CP, CF and total carbohydrate was higher ($P < 0.05$) in mineral supplemented group of animals resulting better availability of nutrients to animals. The milk yield and 4% FCM yield were higher by 17% and 20%, respectively, following mineral mixture supplementation in cows. The milk constituents viz. fat, SNF and TS were also increased ($P < 0.05$) by mineral supplementation. The economics of feeding supplemental mineral mixture revealed that net return over feed cost was 25 % more than control. Feed efficiency was improved by 10% in T_2 indicating beneficial effect of mineral mixture supplementation in dairy cows which in turn enhanced the income of farm women. It was concluded that supplementation of mineral mixture in roughage based diet economically improved the feed efficiency, milk production and milk composition of lactating crossbred cows in coastal belt of Odisha.

Knowledge of women livestock keepers about the health issues like timely vaccination and other important diseases were also studied. Regular health camps were organized in the adopted villages. The practice of using feeding manger is virtually nonexistent in rural Odisha. 30 feed mangers/ azolla growing tanks were introduced among the farm women. Upon introduction of feed manger the animals were fed chaffed fodder in the manger. The farm women realized the importance of manger as it reduced 2-30% wastage of feed materials thereby improving the feed loss and improving efficiency of feed utilization by animals.





ICAR-IGFRI, Jhansi

In the Bundelkhand region of Central India where occurrence of drought is a frequent phenomenon, farmers have adopted dairying as an important livelihood vocation. The ownership of buffaloes (number of buffaloes per 1000 human beings) in Datia district is among highest in the country. The farmers are engaged in rearing buffaloes and sell fresh milk in the nearby town of Jhansi and Datia. Women shoulder most of the responsibilities related to rearing and management of dairy animals however they have little knowledge of the important cultivated fodder varieties and technical knowledge of growing and utilizing them. Besides, the access to improved quality of seeds of fodder varieties is also an important hurdle in adoption of green fodder on a large scale in the villages. Therefore, for capacity building of women dairy farmers and initiating them into cultivation and use of green fodder for feeding buffaloes and cattle, field demonstrations on 134 varieties of Kharif fodder crops and 128 varieties of Rabi fodder crops were laid out in the farmer's field in Bagedhari and Nunwaha villages in Datia district of Madhya Pradesh.

The average green fodder yield of sorghum cv MP Chari was 572.5 q/ha in summer and 404.5 q/ha in kharif. Similarly, the green fodder yield in pearl millet cv AVKB-19 was 426.58 q/ha, maize (African Tall) (465.59 q/ha) and cowpea -EC4216 (249.72 q/ha). A total of 262 demonstration plots of fodder cultivation were made to initiate the practice of cultivation of green fodder in the two villages.

Five demonstrations on conservation of green fodder through silage making were done through participatory approach in which farm women themselves made silage at their farm. The learning by doing approach instilled the confidence in them and the surplus green fodder produced at their fields are regularly being conserved into silage for lean season feeding. A training programme was also organized on a large scale in the village to improve skill and knowledge of farm women on forage production and utilization. Similarly, a training programme on "Drudgery reducing tools for farm women" was also organized on 15th Dec. 2016 to sensitize farm women about the drudgery reducing tools and equipments available and their methods of use in various cultivation activities.

Yield performance of different forage crops at farmers' field in two villages

Fodder crops	No. of farmers	Average forage yield (q/ha)		
		Nunwaha	Baghedhar y	Average
Summer Sorghum (MP Chari)	8	585	560	573
Kharif Sorghum (MP Chari)	39	404	405	405
Maize (African Tall)	26	473	458	466
Bajra (AVKB19)	23	416	437	427
Cowpea (EC4216)	38	254	245	250
Berseem (Wardan)	64	938	966	952
Oat (Kent)	64	671	658	664



Details of different technologies disseminated at farmer's field

Name of the activity	No of women farmers adopted
Demonstration on fodder technology (kharif and rabi each)	262
On farm trial on fodder based animal ration	30
Demonstration on fodder conservation (silage making)	5
On farm trial on management of anoestrus / silent estrus	10
On farm trial on mineral mixture supplementation for milch buffaloes	20
Training on drudgery reduction, livestock production and allied techniques	200

Based on the farmers response for fodder production and conservation, berseem and oat were preferred by most of the farm women. For silage making maize and sorghum were the preferred crop. Demonstration on fodder based mixed balanced ration preparation resulted in 10-15 % increase in milk yield in dairy animals. Supplementation of mineral mixture to dairy animals and anestrous heifers augmented milk production (10-12%) in lean period and improved cyclicity and conception rate by 15-20%. Farm women realized the potentiality of these technologies and propagated in their field for more income generation and their upliftment through dairy farming. Drudgery reducing tools distributed by the project were adopted by women farmers which facilitated the involvement in fodder development and dairy husbandry activities enhancing their productivity.

NDRI, Karnal

The project was undertaken in two adopted villages i.e Pingli in Nissing block and Jundla in Assandh block of Karnal district in Haryana to introduce scientific interventions in livestock enterprise for empowering women belonging to landless and resource poor farm families. Status of technology adoption and gender issues in dairy farming were identified using PRA techniques. Women self help group with 20 members representing all socio-economic categories was formed in both the villages. Based on the identified problems, a technology matrix was prepared indicating the identified problem, possible solutions and mode of implementation of the technological interventions.

Profile of farm women and gender issues in the adopted villages revealed that majority of respondents (53.3%) belonged to middle aged group and male headed families (90%). Crop and dairy farming was practised by most of the respondents (40.8%). Majority of the farmers in Jundla village were landless having small herd size, low milk production and lower income. Most of the respondents had chaff cutter and pumpset, pucca house for their residence as well as for livestock. The legal title of land were mostly in the name of male members of the family. The farmers had very little contact with village level extension personnel and had occasional contact with NDRI scientists, veterinary surgeon and animal feed dealers. The usual source of information in dairy sector were relatives, friends, brokers, commission agent, mass media and NGO.

It was revealed that lack of knowledge on preparation of farm made feeds, lack of access to green fodder by landless farmers, gap in adoption of important management practices, knowledge in scientific and hygienic production of milk and milk products, awareness about government schemes were the major problems faced by the women farmers. Problems in breeding, feeding, management practices of dairy farming, non-availability of milk-cooperatives, lack of access to training, low price of milk, lack of access to loan and credit facilities were some of the major constraints faced in dairy production. In majority of cases, men took decisions regarding land property (71.7%), credit (69.2%), purchasing and selling of implements (75.8%), investment, seeds, fertilizer and other farming related resources. In case of livestock related decision, 55.8% women farmers took decisions in consultation with their male counterpart. Majority of farm women spent a lot of time in collection of fodder, preparation of feed, cleaning of animal shed and less time in marketing of milk and animals.

A number of scientific interventions were introduced in the adopted villages for improving the livestock productivity and income generation of the farm women.

It was observed that there was reduction of 30% production cost by adopting preparation of balanced ration by the farm women using locally available feed resources and saved money ranging from Rs.500-2000/- month. Improved fodder variety i.e BL-42 enhanced the income of farmers by 10-15% due to more number of cuts and higher biomass yield. Urea molasses mineral block (UMMB) making machine developed by IVRI, chaff cutter with safety lock from IARI, Bajra napier rooted slips from IGFR, Jhansi, silage bag etc. technologies helped to reduce the production cost and thereby enhanced income of women dairy farmers. Veterinary camps and interaction meets in both the villages were also organized which enhanced greater understanding of the scientific technologies in dairy farming among the farm women. Exposure visit to NDRI were also organized for the farm women and training programme on preparation of milk products resulted in adoption of several technologies by the farm women at household level such as paneer regularly and burfi, lassi, flavoured milk making occasionally. Interventions such as compound cattle feed preparation at the farm, preparation of milk and milk products, use of serrated sickle for fodder harvesting, California mastitis kit, hybrid napier cultivation and drudgery reducing farm tools like milking stool, dung scraper etc carried out by NDRI were perceived as beneficial, profitable and useful by the members of farm women group in both the villages.

Among the four indicators which constituted the women empowerment index for this study, economical indicator was found to be the most important in empowering women by experts followed by social, technological and psychological indicators in order. Significant change was observed in the study area in their income, control over use of income, decision making ability, adaptability, risk taking ability, awareness, knowledge due to interventions. Rate of adoption, training received and income was found to be the significant contributing variables to level of empowerment.



BAU, Ranchi :

In the tribal dominated areas of Jharkhand State, backyard poultry and pig rearing are important activities to supplement household income of farm families. Under the project, two villages i.e Kharsidag and Rudung cocha in Namkum block of Ranchi district was selected to study the impact of scientific livestock interventions on productivity and change in income of women livestock keepers. In Kharsidag village 19 farm women were given 3 crossbred piglets (T&D) (2 female and one male) each and in Rudung Cocha and Kharsidag vilages a total of 25 farm women were distributed 16 day old chicks of poultry breed Divyayan Red each totaling 550 in two phases. Training programme were organized off campus and in villages to train women in scientific rearing of backyard poultry and pigs. A total of 54 farm women participated in the offcampus training on 26-10-2016 and 48 in training programme organized in the village Kharsidag on 10-11-2016. Another training

programme for 3 days was organized from 27 to 29-1-2017 at the Campus of Ranchi Veterinary College. Besides, exposure visit cum training was also organized for 83 women farmers from the village Kharsidag and Rudung cocha during 20-22 March, 2017 on occasion of Kisan Mela organized by BAU, Ranchi.

It was observed that piggery programme enhanced income of the household (94%) through improvement in knowledge on proper care and management, marketing of pig rearing. They also said that pig rearing is a profitable venture as there is a ready market for it in village itself. Similarly, the activity of backyard poultry rearing benefited all the women farmers (100%) adding income to the household. Further, this programme increased the household consumption of nutritious diet improving health and wellbeing of farmers. The benefits accrued from the two interventions are summarized in the table.

Outcome of the livestock interventions in the two adopted villages

Sl. No.	Outcome	Kharsidag	Rudungcocha	Total	
		No	No	No	%
1.	Women farmers who reported additional income through poultry/ pig rearing	17	25	42	95
2.	Improved care and management of pig rearing	17	-	17	94
3.	Improved care and management of poultry keeping	-	25	25	100
4.	Increase in household nutrition	-	25	25	100
5.	Easy marketing of poultry and pigs	15	25	40	91
	Total	17	25	44	100

Income received by the farm women from the livestock enterprise was classified into four groups. About 36% of the farm women who reared poultry reported that they received less than Rs. 1000/- and majority of them (60%) earned between Rs. 1000/- to Rs. 2000/-. A few farm women (4%) rearing poultry earned between Rs. 5001-8000/- because of fewer mortality (less than 5%) and better market price of adult birds. In case of pig rearing activity, 29% of the women earned Rs. 2001-5000/-, 35% received Rs. 5001-8000/-, 12% received Rs. 8000-11000/- and rest 24% of the women earned more than Rs. 11000/ in the second year of the programme.

Upon completion of the project activities, 5 arm women in the village Kharsidag, 5 are continuing with the piggery. In Rudungcocha village 13 new members agreed to adopt poultry programme and 10 members came ahead to take up piggery programme. Altogether 38 new households reported to continue poultry

programme and 10 new households agreed for taking up piggery programme. Among the old group, 5 women reported to continue piggery programme and 25 women (100%) would continue poultry programme after completion of the project.

Impact of poultry and pig interventions: Farm women continuing with the activities

Sl. No.	Livestock kept by women	Kharsidag		Rudungcocha		Total	
		Old group	New group	Old group	New group	Old group	New group
1.	Poultry	3	25	22	13	25	38
2.	Piggery	5	-	-	10	5	10
	Total	8	25	22	23	30	48

After attending several training programmes and group discussions women developed interest for the piggery and poultry farming. It was observed that women groups became motivated and enthusiastic for the programme when poultry birds started laying eggs and sows delivered piglets raising the hope for income opportunity for the farmers. In case of poultry rearing, the eggs laid by birds at first time were mostly consumed in the household but subsequently they were also sold to get regular income. In pig rearing the maximum number of piglets delivered by sows was 10. Farm women sold the piglets after 3-4 months of rearing @ Rs. 2000/- per piglet and boars @ Rs. 160 per kg (meat purposes). Farm women gradually gained confidence on the principle "seeing is believing" and because of the income they earned, continued with these activities without the support of the project team. It was observed that lack of knowledge about the improved breed of pigs and also poultry birds, lack of motivation for adopting new technology in the family, loss of piglets and poultry birds too due to lack of awareness due to ill health, feed shortage were the major limitations for farm women development of the programme. It was concluded that women of these two villages preferred to adopt poultry rather than piggery programme. It might be due to the fact that, the feed of the piglets are not available locally which created problems to them for the feeding of the piglets. Poultry birds were manageable for them compared to piglets.

ICAR-NEH Region, Meghalaya:

The majority of population in North East Himalayan (NEH) Region prefers meat in their diet and poultry meat is accepted by most of the people. About 70% population of NEH depends upon agriculture for their livelihood but the hill topography, climatic and socio-economic conditions prevents people from realizing the potential production in agriculture. About 10% of the total land in the NE region is used for cultivation. Backyard poultry farming has emerged as an important alternative livelihood option for farm women in the region providing income and household nutritional security. As majority of the population in the region is non-vegetarian the demand for meat and egg is high. But the livestock productivity and total production prevalent in the region is low because of the traditional method of livestock farming practiced by people and it has been estimated that the state of Meghalaya has a demand-supply gap in meat sector is about 1,000 tonnes. Based on needs of the region, dual purpose backyard poultry birds (Vanaraja and Gramapriya varieties) with high production potential were introduced and popularized among resource poor farm women as a source of sustainable livelihood and nutritional security. The Vanaraja and Gramapriya birds

are coloured birds which resemble indigenous birds and they fetch better price in the market for their meat and egg.

Awareness among farm women of Umlyngka Pdengshnong village, East Khasi Hills District, Meghalaya were created for taking up backyard poultry by undertaking capacity building programmes including training, farmer's field day cum awareness by the scientists of ICAR Research complex for NEH Region, Umiam. The farm women were trained in scientific management of poultry birds including housing, feeding, breeding and health care management. Regular visits were made to the beneficiary households for periodic health check up and to collect information on growth performance and egg production of the poultry birds. The farm women were offered suggestive advice for preparing low cost feed for the birds using locally available feed ingredients. The initiative under the project received overwhelming response and covered a total of 50 farm women who received inputs related to backyard poultry keeping. Of these, 20 farm women were provided with 400 birds of 6-8 weeks age @20 birds per/beneficiary along with feed and medicine. 15 farm women also received minor farm implements to ease the drudgery burden while doing agricultural operations. Out of the 400 birds, a total of 240 birds were sold @ 180 per kg, when they attained an average body weight of 3 kg in the first lot and each farm women earned on an average Rs. 6152/- (range Rs. 4420 to 11900) through the sale of birds. Of the 20 farm women, 11 beneficiaries utilized a part of their income thus earned in repurchasing new birds. In the second cycle, these farm women repurchased 550 birds of which, 476 numbers of birds were sold @ 180 per kg after attaining an average body weight of 3.0 kg, thus earning a total income of Rs 16,696 (range Rs. 5,000 to 35,145). The profit earned by the women was Rs. 3356/- (range Rs.700 to 4780) after the cost related to purchase of birds, feed cost and other cost were deducted from the total earnings. The remaining earning from this venture was utilized for the purchase of essential commodities required at home. The other beneficiaries who did not go for repurchase of birds, utilized the income in providing the needs of their children and other household requirements. Again, from these 11 beneficiaries, 5 farm women made another round of repurchase thus making backyard poultry as a sustainable enterprise for their livelihood. A part of the profit earned was deposited into bank, paying school fees and buying goods needed for daily use at home. In the third cycle, a total of 210 birds were purchased by the 5 beneficiaries. These birds are still remain with them as they are yet to attain the required body weight for sale in the market. Five farm women have also retained some birds for egg laying for household consumption and

occasional sale @Rs.10 per egg. Considering the benefits in keeping backyard poultry birds, farm women decided to continue with this enterprise as a subsidiary activity to supplement household income and nutrition. The success of these women also motivated others and many farm women and other unemployed youths came forward to start this enterprise in their village. The farm women also expressed their happiness the performance

of the dual purpose Vanraja and Grampriya birds because of their low mortality, faster growth rate, higher egg production with large sized eggs when kept under low input system with less investment and space requirement. The success of the backyard poultry keeping may be popularized to address the issues of increasing household income and nutritional security.



Fig. Backyard poultry keeping by farm women in Meghalaya

Project 12: Enhancing Income of Rural Women through Improved Goat Rearing

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

Goats are an important source of livelihood especially to rural women in the coastal belt of Odisha. The Odisha-West Bengal-Jharkhand corridor has one of highest ownership of goats in the country indicating their important role in providing supplemental income to rural women. In spite of the strong dependence of the rural population on goats as a source of livelihood, there is a huge technological gap in the rearing and management practices followed by the farmers. This results in sub-optimal productivity and mortality and morbidity due to various diseases. Therefore this project was initiated to study the existing goat rearing practices and identification of constraints of farm women and to assess the effect of scientific intervention on productive performance of goats and income flow of goat rearing households alongwith capacity building of farm women through improved goat rearing. The project was implemented in two major goat producing districts i.e Ganjam and Khurda of Odisha. Based on the density of goat population, one cluster of villages including Jirabadi, Kumunda, Lepa, Pusapali, Chadiapali, Panchabhuti, Dungapali, Angya Prasad, Sasan, Kiadhar, Katkati, Chopra, Jagannath Prasad in Ganjam district and another cluster villages which included Tenturidih, Mangarajpur, Jhintikapali, NAC Banpur, Pratap,

Tenduripadar, Banpur block in Khorda district were selected for detailed survey of existing practices of goat farming status and animal husbandry practices adopted by rural farm women. Data were collected on aspects of gender related information (control of resources, ownership of goats, land rights, decision making etc.), feeding, breeding and managerial practices, marketing linkage, govt. policies for goat rearing and schemes followed by farm women.

The PRA study and focussed group discussion with farm women revealed that most of them who were engaged in goat farming belonged to SC/ST and OBC community of small and marginal farmers. The intensity of goat rearing in commercial mode was more in Ganjam district than in Khorda district. The gender related information (control of resources, ownership of goats, land rights, decision making etc.), revealed that managerial practices of goats are regulated by women and awareness on marketing linkage, govt. policies, goat schemes were handled by men. However, major expenditure from the proceeds of sale of goats were made by joint decision of men and women in the family. Study on 50 farm families in both the cluster of villages revealed that lack of supplementary feeding, poor growth rate, poor access to health care and market and high mortality rate of kids were the major constraints in goat farming. Further, lack of input resources, institutional and technical support for higher income through entrepreneurship mode were major

limitations for progress in goat farming in entrepreneurship mode. It was observed that feeding of protein rich oil cakes and supplementation of mineral mixture as a part of balanced ration were rarely practised. Housing managerial measures undertaken by farmers were very poor which resulted in 20-30% mortality in the first 2-3 months of age causing tremendous loss to farm women. The study concluded that supplementation of ground nut oil cake @ 50g/goat/day and mineral mixture @ 10g/goat/day to growing kids (above 6 month age) improved growth rate by 15%. Housing with raised bed wooden floor with ventilation coupled with proper health care and vaccination reduced the mortality of kids.

Project 13: Promoting Gender Equity through Family Poultry Production

A.K Panda

The importance of small scale poultry farming in rural areas has been recognized globally to alleviate poverty, hunger and malnutrition in developing countries. Family poultry is small scale poultry keeping by households using family labour and wherever possible locally available feed resources. Family poultry production (FPP) represents an appropriate system to contribute to feeding the fast growing human populations and to provide income to poor small farmers, especially women. The project aims to empower women in the family poultry sector by facilitating of scientific interventions for increasing the income of farm women. Gender empowerment on resource ownership, decision making ability and authority, independence and capacity to build entrepreneurship in family poultry farming will improve socio economic status and livelihood support of rural farm women and will promote gender balance in rural areas.

During the period under report, the household surveys of farm women were conducted through a structured interview schedule to study the existing production system and constraints faced by them. Focused group discussion was carried out with women/women self help groups (SHG) in the selected locations to identify gender related constraints, needs and opportunities in FPP. The base line information on status of rural poultry from 100 households was obtained from 3 selected villages under the project.

The preliminary observation revealed that 28 percent of households were engaged in backyard poultry farming with capacity ranging from 5-15 non-descriptive chickens with traditional method of rearing and women play major role in it. The various constraints identified were low production potential of birds, lack of

supplementary feeding, lack and difficult access to veterinary services (vaccines and quality chicks), lack of awareness and knowledge on improved practices and limited access to knowledge, technology and extension services such as market information, credit etc. One of the major problems identified was lack of scientific management of chicks during initial four weeks of age. With regards to gender role in FPP, it was found that most of the day to day work under FPP were performed by women. The construction of shelter of birds was joint responsibility while health coverage was taken care of by men. Women looked after the feeding aspects of poultry. Most of the decision related to FPP was taken jointly. The information on gender based needs and constraints in FPP identified through focused group discussions revealed that lack of participation of women in training programmes could be due to cultural factors, lack of access of information on training programme, schedule venue, and duration of training, lack of access to inputs, technical assistance and marketing system, etc.

Low cost azolla based poultry feed: The feed cost accounts for 70-80 per cent of total cost of production in poultry. Two major problems faced by poultry farmers are higher price and scarcity of conventional feed ingredients. Using alternate non competitive feed ingredients in poultry feed can reduce the cost of production. One such feed is Azolla (*Azolla pinnata*) which is rich in protein, contains almost all essential amino acids, carotene and several growth promoters intermediaries. Azolla production at household level can be taken up by farm women. Hence dietary incorporation of azolla on production performance and egg quality of Vanaraja laying hens under intensive system of rearing was evaluated.

Seventy two, 48-weeks old Vanaraja laying hens were randomly distributed into three dietary treatment groups of 24 hens each and were reared in deep litter system. Each treatment contained 4 replicates of 6 hens each. All the laying hens were kept under uniform managerial conditions for a period of 8 weeks. Three experimental diets were formulated by incorporating azolla meal at 0, 5 percent and 10 per cent levels. All the diets formulated were isonitrogenous and isocaloric. A measured quantity of feed (150 g/day) was offered to each bird everyday during the experimental period. It was found that dietary incorporation of azolla meal upto 10 per cent in the diet of Vanaraja laying hens had no adverse affect on egg production, egg weight and feed conversion (g feed/g egg) and egg quality (Haugh unit, eggshell per cent and eggshell thickness).

Effect of dietary incorporation of azolla meal on production performance and egg quality of laying hens

Parameters	Azolla meal (%)			SEM	P value
	0	5	10		
Egg production (%)	50.09	52.76	51.13	1.81	0.845
Egg weight	61.62	61.62	60.50	0.60	0.692
Feed efficiency (g feed/g egg)	4.41	4.36	4.59	0.22	0.914
Haugh unit	75.38	75.39	74.41	1.04	0.161
Albumen %	58.35	56.86	57.29	0.37	0.249
Yolk %	32.70	34.27	34.07	0.34	0.121
Eggshell %	8.95	8.85	8.63	0.12	0.572
Eggshell thickness (mm)	0.372	0.381	0.378	0.005	0.452

It was concluded that azolla meal can be incorporated upto 10 per cent in the diet of Vanaraja laying hens without any adverse affect on egg production and egg quality. Production of azolla can reduce investment on feed cost by women and can be taken as a subsidiary activity.

Project 14: Promoting Agricultural Education among Rural women for Entrepreneurship Development"

A. K Panda

Agricultural education entails the use of scientific knowledge in the teaching and learning of food production through the acquisition of knowledge of crop production, livestock management, soil and water conservation and other associated benefits for industrial and human development. Improving quality of agricultural education holds the key to propelling not only agricultural growth but also developing technologies for sustainable agriculture leading to livelihood and nutritional security. Under the project, enhancing the reach and effectiveness of agricultural education to farmers, rural women and other stakeholders through non-formal education were identified as one of the activities. Although formal

education system in agriculture is well developed, but access of rural women to agricultural education is almost absent in India.

The project was implemented in Balipatna and Nimapada block of Puri district of Odisha. One GP from each block (cluster of 2-3 villages) were randomly selected. PRA was used to assess the profile of different categories of women, their involvement in farming and farm related activities, resource availability, socio-cultural and economic environment. A checklist was also developed under the project to assess potentiality for entrepreneurship. Through focused group discussion (FGD), the factors influencing **agri-entrepreneurship developments by rural women** were identified and recommendations were made to address the constraints (**Table 1**).

Factors influencing agri-entrepreneurship developments by rural women

Sl No.	Constraints	Reasons	Recommendation
1.	Over burdens due to dual roles	Dual roles as, wife and mother leading to lack of time, concentration and overburdened personal obligations	Sharing of responsibilities
2	Lack of Confidence	At household level women has limited or little autonomy, lack of awareness and experience	Basic management skills Exposure visit Dev of Leadership quality
3	Rigid and male dominated market conditions	women, entrepreneurs have to depend, on their family male members, lack of awareness, experience, and lobbying capacities.	Family members, NGO's, GOS - Accessing information about available market opportunities, conditions and services
4.	Lack of proper training	Societal Norms Lack of exposure Restricted movement Lack of networking & awareness	Equal opportunities Proper training and skill development Freedom to network with others
5.	Lack of access to financial support	Lack of share in the property No Government or private loans, schemes incentives, etc.	Equal share in the parental property Access to Private & Government loans support
8.	Lack of access to resources	Withdrawal nature, Societal norms and Taboos,	Build the capacities to identify their priorities Policy recommendation

The potential areas for agri-entrepreneurship development based on the interest, attitude, scale of production, marketing avenues, etc. were identified. The major gaps identified were lack of knowledge, skill and contacts, lacunae in management skills, lack of risk bearing ability, lack of linkage with experts and scientists, choosing and getting a profitable location for an enterprise and lacking of innovativeness. Suitable agri-educational modules were developed keeping in view the different roles of women on one hand and the need for developing an appropriate enterprise on the other. Workshops were conducted involving R&D stakeholders and selected women to identify the gaps.

A brainstorming workshop on the theme "Promoting Agricultural Education among Rural women for Entrepreneurship Development" was conducted on 18 March, 2017 at ICAR-CIWA. To discuss need for Agricultural Education for entrepreneurship development for bringing roadmap to gear up the existing curriculum to equip the students to enable the rural women and develop entrepreneurs among them through innovative methods of education. Forty participants comprising of scientists, agri-educationists, RA, SRFs and post graduate students participated in the workshop.

Brainstorming workshop under progress



Project 15 : Assessment of Integrated Farming Model for Improved food security and livelihood in Rural Household

Jyoti Nayak, Abha Singh and Tanuja S.

As per the resource availability and willingness of the respondents, three types of farming system models were evaluated in 10 households in Mahanga block of Cuttack district, situated in the East and South-East Coastal Plain agro-climatic zone of Odisha. Of the three models, Crop+Horticulture+Dairy+Honey bee was

found to be the best model considering the profitability, sustainability and economic viability. After carrying out the resource based action research for three successive years in participatory mode at the farmer's field, it was recommended that, a model of 1.5 acre (0.9 acre, grown crops, 0.45 acre, horticulture, 0.07 acre, honeybee, 0.06 acre, milch cow shed, 0.02 acre, bio-compost) was suitable for increasing income of a five member family over traditional cropping system by 33 per cent. Linkages were established with the institutions like CHES, CARI, Odisha Khadi Board, NRRI, CPDO, OUAT, State Coconut Board for procuring inputs and technical guidance through demonstrations, exposure visits and farmer-scientist interface. It was observed that the farm families continuously received income, crop and vegetables for their daily dietary consumption for a healthy and active life through the adoption of integrated farming system as compared to monoculture cropping system.

Success Story: 1



Smt. Binita Panda,

Village : Jhadeswarpur, Vai. Nischintakoili,
Dist: Cuttack

Smt Binita Panda (age....) born on 7th June, 1977 with intermediate education has experience of 20 years in farming. She lives in a joint family with five members including her parents and owns 2.5 acre land. After meeting in an interface under the project entitled "Assessment of Integrated farming Model for improved food security and livelihood in rural household", she showed interest to keep honey box in her backyard to supplement the family income. The project team visited her house and accessed the available resources and established linkages with Khadi Udogya at Bhubaneswar. She was also provided with honey boxes and accessories and advised to modify her farming practices to a sustainable integrated system. She was also given training on mushroom cultivation. By diversifying the family enterprise she produced 7 to 9 kg honey per box and earned Rs.3,500- Rs.5,000/- from one box. Binita Panda also shared that honey bee keeping does not require much skill, it only involves practice to

handle the bees and it was a onetime investment. She sells honey in the market. She has kept five boxes. She has also developed a nutritional garden and gets seasonal vegetables. The B:C ratio is 2.05. She is very happy to see their backyard changing into an integrated farming model.



Success Story: 2



Smt. Kamini Nathsharma

Village At: Dularpur, Po:Jhadeswarpur, Block:
Mahanga, Dist: Cuttack

Smt Kamini Nathsharma born on 5th July, 1975 with VII standard education has experience of 21 years in farming. She lives in a joint family with five members including her parents and owns 2 acre land. Innovation was a necessity for her five member family, including her mother-in-law, who were entirely dependent on their small farm. They often wondered," How can they lift

their family out of this trap? As per their resource availability and willingness, the project team had developed a model in their backyard and gave them input like improved vegetable seeds, seasonal fruit planting materials. They had unutilized pond and were interested to keep ducks. They also established a house for poultry by extending their living room veranda. They were provided with poultry chicks (vanaraja) and duckling (khakibell) procured from CPDO and CARI. To feed the two cows they were persuaded to grow hybrid Napier grass. The project team also arranged exposure visit of the farmers to different ICAR institutes for skill development and knowledge gain.

Smt Kamini Nathsharma get money from selling eggs in local market. The milk yield was also enhanced by feeding napier and balanced feed. They obtain seasonal leafy vegetables, eggs and milk for their daily household consumption. The surplus vegetables are sold in the village market. The B:C ratio is 1.75. Now she has not only been able to increase her income but also enhance the nutritional status of her family.

Project 16 : Empowerment of farm women for improved quality of life

Abha Singh, J. Nayak and L. P. Sahoo

Lead centre: ICAR- Central Institute for Women in Agriculture, Bhubaneswar

Collaborative partners

1. ATARI Zone-I, Ludhiana and KVK-Patiala
2. ATARI Zone-VI, Jodhpur and KVK- Choumu, Jaipur
3. ATARI Zone-VII, and KVK- Mazagava, Satna

Quality family living envisages and enables convergence between secure livelihoods, availability and access to quality food, ecosystem balance and human health. Empowering farm women for better quality of life is an important issue today. Girls and women face multiple deprivations because of gender discrimination and under nutrition. Improved nutrition would require technological innovations, without changing social arrangements, not only in short run but also in the long run. Knowledge, Training and skill development is critical for providing decent employment opportunities to the rural women. Further, skill developments need to take place in demand driven manner so that women can supplement the family income by taking- up some economically viable activities to meet the various family demands.

Assessment and management of nutrition status :

Nutritional status of farm women was assessed among 40 selected households. The result indicated that 52.5 per cent women were normal as per their Body Mass



Index calculated by anthropometric measurements and 10 per cent were obese. Around thirty seven per cent women were facing Chronic Energy Deficiency from mild to severe degree. Disease and health situation was also assessed and it was found that tuberculosis and diarrhoea affected the families from 15-30 per cent. As large number of population is suffering from CED, intervention has been initiated among 40 farm families.

Demonstration of Nutrition Garden: At each centre, 40 nutrition gardens were established in this year to reduce the mal-nourishment problem in children and women especially anaemia and Vitamin A deficiency and focus was given on green / yellow and protein rich vegetables. Seeds of Spinach, Fenugreek, Carrot, Turnip, Coriander, Amaranth and also distributed seedlings of Tomato, Cauliflower were distributed for rabi season. Emphasis was given to grow vegetables without using any insecticides/pesticides and intake of such vegetables will help them to improve their health status.

Skill up gradation trainings were conducted to enhance the capacity of farm women to incorporate low cost nutritious food items in their diet the management of nutrition of infants, children and adults.

Nutrition Education to farm women: Nutrition education sessions were organized to improve the knowledge of farm women.

Drudgery reduction of farm families: Demonstration and distribution of drudgery reducing tools: Following women friendly tools were distributed among farm women for reducing drudgery in vegetable cultivation and dairying activities.

- | | |
|---------------------------------|-----------|
| 1. Cow Dung Collector | : 40 Nos. |
| 2. Trowel | : 40 Nos. |
| 3. Light weight hand cultivator | : 40 Nos. |
| 4. Improved sickle | : 40 Nos. |
| 5. Small Sprayer | : 40 Nos. |
| 6. Improved Chullas | : 40 Nos |

Empowerment of farm women for income generation:

Training and demonstration were imparted on Backyard poultry for income generation and critical inputs were supplied.

Project 17 : Ergonomic evaluation of selected manually operated farm equipments in mango and cashew nut

Gayatri Moharana, Naresh Babu and Chaitrali S. Mhatre

Ergonomic evaluation of selected manually operated farm equipment was carried out in mango & cashew nut in different orchards in Dhenkanal and Khordha district of Odisha. A detail study was conducted on role and participation of the farm workers working in the mango and cashew nut orchards. A Database on the performances of the activities by both women and men engaged in mango and cashew nut orchards was developed. Women participated in activities related

nursery raising, nutrient management, harvest and post harvest activities independently, as well as with men workers.

The nursery raising, plantation, weeding, pruning, application of fertilizer, pesticide & fungicide and harvesting are the drudgery prone activities. They perform these tasks with static awkward posture and repetitive motion of upper and lower limbs which was responsible for musculoskeletal injuries and disorders in the long run. Leading to various health hazards in women.

To reduce drudgery of farm women it was necessary to evaluate tool & equipments used by the farm women in fruit crops ergonomically. Therefore, ergonomic assessments of selected traditional activities/ practices carried out by farm women were conducted by measuring heart rate and grip strength of the subject before, during and after the activities with equal time interval. The observations are given as below:

Activities carried out by Farm women and men in Mango & Cashew nut

Sl. No.	Activities	Average working heart rate (beats/min)	Peak heart rate (beats/min)	Average Energy expenditure (kJ/min)
1	Weeding	110	128	8.77
2	Filling poly bags	127	14	11.47
3	Removal of shoot	121	148	10.51
4	Grading & sorting	98	108	6.86
5	Lifting & shifting	118	163	10.02
6	Manual irrigation	96	119	6.64
7	Sowing seed in poly bags	89	119	5.43
8	Grafting	91	99	5.74
9	Clod breaking	128	167	11.63
10	Harvesting (Commercial harvester)	101	121	7.33

Table: Percentage Change in Grip Fatigue

Activities	Rest		Work		% reduction in grip strength	
	Left	Right	Left	Right	Left	Right
Weeding	20.1	23.4	19.0	20.3	18.04	5.30
Grading, sorting & arranging	22.6	26.5	21.5	25.1	4.86	5.28
Scion cutting	29.5	32.73	24.13	25.33	18.2	22.60
Irrigation	12.36	16.4	8.03	10.9	35.03	33.53
Filling poly bags	25.1	26.8	23.83	24.2	5.05	9.7
Clod breaking	37.9	40.33	36.6	35.33	3.43	12.39

It has been observed that in case of farm women, the average energy expenditure was highest (11.63 kJ/min) in filling soil mixtures in poly bags followed by filling poly bags (11.47) removal of shoots (10.51 kJ/min) from cashew nut and mango nursery plants. The grip fatigue was more in case of manual irrigation followed by sion cutting and clod breaking. Though the harvesting caused medium level energy expenditure (7.33 kJ/min), it was done in a very awkward position (hands raised above the workers shoulder level carrying the heavy weight of harvester and the harvested mango). Therefore it caused the most drudgery, hence there was need for immediate intervention.

Interventions for reducing drudgery:

The technological needs and gaps were identified and suitable interventions were introduced to reduce drudgery and hazards of farm workers including women and men. Minor orchard tools like trowel, small secateurs, hand shovel, nursery up-rooter, and hand weeder, khurpa (1 inch width) for improvement in the working capacity of the farmwomen engaged in orchards were demonstrated and distributed. For minimization of the occupational health hazards of women in cashew nut orchards gloves were introduced.

Technological interventions were made in some of the selected activities to reduce the drudgery. Trowels were introduced for filling soil mixtures in poly bags where the work was carried out manually 48-60 bags/hr were filled whereas, with the help of trowel 80-120 bags/hr were filled.

Technological interventions were also made in some of the selected activities to reduce the drudgery. Trowels were introduced for filling soil mixtures in poly bags where the work was carried out manually 48-60 bags/hr were filled whereas, with the help of trowel 80-120 bags/hr were filled. Traditionally the farm women

remove shoots from mango & cashew nut plants 360-400 shoots/hr by naked hands/palms. The liquid secrete from the cashew nut plant is very harmful for the skin as well as create health hazards and also sometimes damage the plants where it was clipped with a greater force. It was felt that there is a need for introducing or using small size secateurs for cutting of shoots and buds from nursery plants to reduce the damage of plants as well as the health hazards of the workers. It was found that the work output has been increased to 550-600 shoots/hr when small secateurs were introduced. After interventions of Trowel and Secateurs, work output increases from 33 to 40 percent. The need to introduce women friendly farm tools and equipment and protective clothing for the farm women engaged in mango and cashew nut orchards was also observed.

Testing of Mango Harvesters

Ergonomic evaluation of the traditional and commercially available fruit harvester were conducted while harvesting of mango by farm women. It was found that harvesting fruits with traditional and commercial type harvester was very much drudgery prone. To reduce the drudgery of farm women tested Nutan & Naveen harvester (BSKVV, Dapoli models) with women's perspective and found that these were easy to operate due to light weight and the damage of fruits were very less. Besides these, three different light weight and low cost models of harvesters were developed with adjustable handles. The harvest bag has been made by plastic net. The handles were replaced with locally available aluminium, steel and PVC pipe which is adjustable and attached to the basket. These were tested by farm women during harvesting of mango and perceived easier to operate. The results of percentage change in grip fatigue of the worker while operating different harvesters for harvesting mango has been given following:

Activities	Rest		Work		% reduction in grip strength	
	Left	Right	Left	Right	Left	Right
With traditional harvester	20.5	22.6	16.8	21.4	5.47	13.24
With Commercial harvester	20.1	23.4	19.0	20.3	18.04	5.30
Refined Harvester (Steel)	14.73	14.96	9.83	12.43	33.26	16.91
Refined Harvester (Aluminum)	9.2	9.76	8.0	9.33	13.04	4.40

The advantage of the harvesters were that, it can be adjusted according to the height of trees. For harvesting quality mangos ergonomically, 20 fruit harvesters (Naveen and Nutan harvester by BSKV, Dapoli) were distributed

Design of dimensions loading and unloading bag

After harvesting the mangoes the operation of lifting the mangoes on the head and shifting them to the unloading spot, further lowering them carefully from the over head height to the ground height in a bending and squatting posture is very drudgery prone hence an easy loading and unloading bag is designed for drudgery reduction. The design is as follows:



Project 18 : Technological Interventions for Drudgery Reduction with Increased Work Efficiency through Women Friendly Farm Tools/ Equipment/ Technologies in the state of Odisha (RKVY)

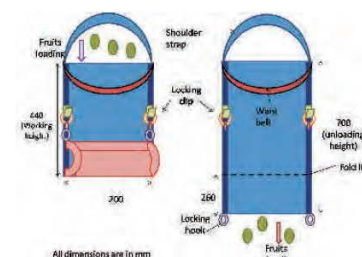
Jyoti Nayak, Sabita Mishra, Abha Singh, Gayatri Moharana and Chaitrali S. Mhatre

Two women friendly farm tools namely seed treatment drum, cotton stalk puller has been for upscaling. Linkage developed with OUAT, Bhubaneswar for dissimilation of women friendly farm tools and equipment among the farm women. Distributed eight tools viz., DRWA hand operated maize dehusker-cum-sheller, Cono weeder, Paddy drum seeder, CRRRI hand winnower, Sitting type groundnut decorticator, hanging type grain cleaner, tubular maize sheller and improved sickle to SHGs through KVKs of OUAT for field assessment. Different exposures visits and trainings were conducted under this projects for drudgery reduction of farm women.

Project 19: Ergonomic studies for increasing work efficiency and productivity of farm women

Chaitrali Mhatre, Jyoti Nayak, Ms Gayatri Moharana, and Jatinder Kistwaria

Development of test protocol for Hand Ridger has been done based on extensive study of prior literature and the available test codes for increasing working efficiency and productivity of farm women. A tools and implements repository was developed. It is utilised for



tool/implements demonstration purpose for various visits and trainings. Procurement of ergonomics equipments was undertaken to facilitate research. A database for scientific references for women in agriculture is done which will be helpful for researchers. Development of the course content to facilitate capacity building of researchers has been done for capacity building of stakeholders. A Checklist has been developed to assess the knowledge gain after the training. A database of gender friendly tool packages was developed for various crops like Paddy, vegetables, maize, etc.

Project 20 : Gender work participation scenario in agriculture

H. K. Dash, Ananta Sarkar

A comparison between census data 2001 and 2011 reveals discernible changes in the scenario of work gender based participation across districts of India. In 2001, 356 districts had male work participation rate of 50 percent or more. But in 2011 number of districts registering a male work participation rate of 50 percent or more increased to 462. Looking at female work participation, only six districts in India a work participation rate of 50 percent or more in 2001. But the number increased to 13 in 2011. While in 2001 there were 211 districts having female work participation rate of less than 25 percent, the number increased to 266 in 2011. Thus there is a big gap between the level of male work participation rate and female work participation rate across the districts. Almost all districts of India registered a decline in the share of cultivators in total workers. Regarding share of male cultivators in male workers, in 2001, 121 districts of India had a share of 40 percent or more. But in 2011, the number of districts with share of cultivators in male workers declined to 101. On the other hand, the number of districts with less than 20 percent of share of cultivators in total male workers increased from 115 in the year 2001 to 222 in 2011.

In case of female workers, the number of districts with

less than 20 percent of share of cultivators in female workers increased from 332 in 2001 to 463 in 2011. Thus between 2001 and 2011 the number of districts that registered low share of cultivators both in male and female workers increased indicating withdrawal of cultivators from agriculture.

At state level twenty four states/UTs registered decline in number of cultivators during the decade with 19 states/UTs registering decline in the number of male cultivators and 24 states/UTs registering a decline in the number of female cultivators. Andhra Pradesh, Chhattisgarh, Gujarat, Bihar, UP, MP, Punjab, Haryana, Karnataka, TN, WB are some of the states that witnessed decline in the number of cultivators.

Regarding district wise scenario of total agricultural workers, 244 districts (i. e. about 46 percent of the districts) had more than 50 percent of total male workers in agriculture in 2001. But in 2011 the number of districts came down to 209 (i. e. 32.5 percent of districts). In 2011, only 130 districts (i.e. about 20 percent of districts) had more than 50 percent of female workers engaged in agriculture. Thus difference in gender scenario is evident.

How has the number of female agricultural workers per unit male agricultural worker changed? In other words how the gender parity in work participation in agriculture has changed. Considering the agriculturally important states, in 2001 the absolute number of female agricultural workers was more than male agricultural workers in states such as Arunachal Pradesh, HP, Nagaland and Uttarakhand. But in 2011, only HP and Nagaland had more number of female agricultural workers than the male agricultural workers. While in many states the ratio declined in 2011, but some states like TN, Odisha, Nagaland, Jharkhand, Sikkim, Andhra Pradesh, Kerala registered an increase in the ratio indicating proportionately more addition to female agricultural work force. Some states that witnessed significant decline in the ratio (i. e. number of female agric. workers per unit male agricultural worker) are Haryana, Gujarat, Maharashtra, Mizoram and Punjab.

Project 21 : Gender Knowledge System in Agriculture

H. K. Dash, Jyoti Nayak, Ananta Sarkar, Shivaji Dadabhau Argade, Shaji A.

During the year district level data on literacy rate of male and female for census 2001 and 2011 were compiled and analyzed to understand changing scenario if literacy across the districts. Gender gap in

literacy rate was found out to identify districts with high gender disparity if literacy. Study showed that In 1991 Meghalaya had the lowest gender gap in literacy rate at district level followed by Mizoram (2.16 percent points) and Kerala (3.27 percent points). In 2001 Mizoram had the lowest gender gap in literacy rate (0. 5 percent points) followed by Kerala (2.98 percent points) and Meghalaya (-3.59 percent points) and the trend continued in 2011. Negative value of gender gap indicates higher female literacy rate than male literacy rate.

Similarly in 1991 the highest gender gap in literacy rate at district level was observed in Uttarakhand (45.78 percent points) followed by Rajasthan (44.25 percent points). But in 2001 Rajasthan had highest gender gap in literacy rate and in 2011 Haryana had the dubious distinction. Looking at the states, Rajasthan had 28 districts with a gender gap in literacy rate of more than 25 percent points in 2011, followed by MP with 8 districts and Haryana with five districts. Looking at changes in gender gap in literacy rate across states, in 2001 eleven states had gender gap in literacy rate less than 15 percent. But in 2011, the number of states went up to 22. District level literacy data can be useful for targeting interventions for women in agriculture.

The following studies were undertaken by collaborative centre: ICAR-RC for NEH Region, Umiam, Meghalaya

- Status, role and knowledge level of Khasi women farmers in Meghalaya (land tenure system, women's rights, changes taking place, participation of Khasi women in agriculture etc.)
- Gender analysis of potato cultivation in Garo Hills of Meghalaya
- A study on Assessment of biodiversity conservation and traditional knowledge of using medicinal herbs/plants by tribal women in Meghalaya
- Study on role of women in pig farming and household livelihood

The following studies were undertaken by collaborative centre: ICAR-Central Institute for Cotton Research

- Study on Gender friendliness of cotton extension programs (e-Kapas and Front Line Demonstration)
- Study on various issues faced by women in general in cotton and particularly in distressed families

22. All India Coordinated Research Project on Home Science

The All India Coordinated Research Project (AICRP) on Home Science is in operation at eleven Centres/ SAUs viz. CCSHAU, Hisar; PAU, Ludhiana; UAS, Dharwad; UAS, Bengaluru; MPUAT, Udaipur; PJTSAU, Hyderabad; GBPUAT, Pantnagar; VNMKV, Parbhani; AAU, Jorhat; CSKHPKV, Palampur and TNAU, Madurai. The All India Coordinated Research Project on Home Science covers five disciplines of Home science-Home Science Extension & Communication Management, Family Resource Management, Foods and Nutrition, Human Development & Family Studies and Textile & Apparel Designing. The main focus of the project is empowerment of women in agriculture for their improved livelihood, nutritional security and drudgery reduction for quality life. The salient achievements of the project according to its thrust areas during the year 2016 & 2017 have been summarized below:

1. Techno-socio economic-dimensions of women empowerment

Under the project on Techno-socio economic-dimensions of women empowerment, emphasis was laid on improving the quality of life of rural families through transfer of technologies and income generation. Several extension strategies were tested for improving knowledge and skill of rural women. To achieve the objectives of the project the following activities were carried out:

Technologies/practices tested and applied in field

Technologies/ practices for as income generation through different enterprises viz, preparation of washing powder for clothes, dish wash liquid, liquid soap, phenyl, floor cleaner, herbal shampoo, pain relief balm, candle making, neem cake powder as fertilizer and pesticide, multigrain attah-nutritious roti, healthy living, banana fibre based micro enterprise, soy paneer (Tofu), use of neem for storage of clothes, herbal plants, processing and packaging of pulses, fruits & vegetables cultivation floriculture, improved animal husbandry practices, value added products from moringa, amla and millets were tested and applied in the field. Seven hundred twenty two farm families adopted these technologies and practices in the states of Telangana, Assam, Himachal Pradesh, Rajasthan, Punjab and Uttarakhand AICRP centres.

Entrepreneurship established

Twenty-three enterprises viz. liquid dish wash, phenyl, floor cleaner, herbal shampoo, pain balm (viz.zendu balm/mentho plus etc), jams, ketchup, pickles, washing powder, phenyl, floor cleaner, herbal shampoo, pain

balm, oil, saree petty coats, jute bags, beads bags, handmade fancy thread bangles, earrings, artificial jewellery making, weaving, soya processing unit, flour milling, vermicelli preparation, processing of pulses and value addition units, bakery/food products, vermin-composting, bee keeping, swasam naturals and pannai mahazir kulu were established for income generation of the farm families. During 2009, Ganapathi SHG, Puttapaka village of Nalgonda district of Telangana established a weaving unit for income generation activity. They have taken loan of Rs.2,00,000/- from nationalised bank to strengthen their group activities to a profitable entrepreneurship from which each member earned Rs.1500/- per month. This activity inspired them to work jointly to weave traditional sarees and dress material through natural dye for export purpose.



Linkages developed

SHGs were linked with different government and non-government organisations through training, lectures, demonstration, exhibition for development of vermicomposting units awareness on swachhata, SHGs formation, plantation & distribution of saplings of fruits utilization of waste plastic bottles etc. for wider dissemination of value added products. Collaboration with institutions viz., DRDA, ATMA, NABARD, Banks were



initiated for credit facilities and market linkages. The state line departments, national level institutes, schools, NGOs and Mass media shared their inputs for strengthening the knowledge, skill development and awareness creation activities among the rural families for improving the quality of life. SHG members and other women were linked to different schemes particularly for skill development.

Success Story

Success Story 1: Value added products - SWASAM NATURALS (Natural breath)

Through AICRP on Home Science a training programme was organized on Value added products from millets. Mrs. R Sathya, 49 years old women entrepreneur from Kondayampatti village of Madurai district runs a small scale millet based entrepreneurial unit alone. She has completed her primary schoolings from the same village. She got married at the age of 22 with a military man and has 3 daughters. She went through economic crisis after the death of her husband. Then, she attended free training program on "Value added products from millets" of ICAR-AICRP on Home Science at Entrepreneurial Development Centre, Home Science Extension, Home Science College and Research Institute, Madurai during the month of January 2016. During training program she was actively involved in all the activities and established a network among the peer groups. Initially, she prepared small amount of Adai mix, Kali mix and sold to neighbours. She was inspired by the peer groups and started a unit for small scale production. She directly procured raw materials (Black Gram, Millets, Sorghum, Ragi and Maize) from Allanganallur, Pallemadu farmers by paying cash and prepared flour mix following hygienic measures from the powdered, cleaned, soaked and sun dried grains. She created a brand name in the SWASAM NATURALS (Natural breath). Based on the market value she used to fix the rates for the products. The quantity of the products varies from 150g to 300g. She has also developed novel products such as Maize dosa mix which has good demand in local market. She had marketing and promotion strategies for selling the products by distributing pamphlet to the community. She has exhibited her products in KVK fair, Agri-Science fair, Food festival etc.

Success story 2: Soya to 'Tofu': A specialized training on soya processing was organized in collaboration with Agricultural Engineering Department of College of Agriculture, CSKVV, Palampur for members of a group (Om Sai Ram) formed under the project in village Molichack. An exposure visit was also organized for these women to the Soy processing unit running in the Agricultural Engineering Department of the university.

Initial expenditure along with small equipment like weighing balance, mixer and grinder, paneer press, tubs, patilas, measuring cup etc. were provided to the group. The ladies were monitored continuously to prepare quality product. Training was also imparted to them on weighing, packing and marketing techniques. Now, they are selling 'tofu' in the village, university campus, local degree colleges, local colonies as well as in near by shops for regular use as well as for functions at Rs. 150/ kg. Resources provided by the department were withdrawn gradually and they have purchased equipments and utensils from their own resources to sustain their unit. During their first season they earned about Rs.7500/-.



Success Story 3: Conservation of renewal energy through bio gas plant

Campaign was organized in village Talwandi Khurd of Ludhiana district, Punjab in collaboration with Punjab Energy Development Agency with the objective of motivating farm families to adopt bio gas plant for saving conventional fuel sources, appropriate use of farm waste and protecting them from smoke. Awareness and motivation campaign resulted in registration of 11 families for construction of bio gas plant. The facilitation processes for these families was initiated and bio gas plants are in the process of construction.

Success Story 4: ICT user group

An ICT user group of 20 members with the local farmwomen, SHG group members, woman Pradhan, SHG leaders, Progressive farmer, Pro-active youth leaders, AICRP Extension Scientist was established at AICRP-HSc adopted Village Nagireddyguda. Information needs of farm women in Agriculture and Home Science were assessed through participatory need assessment and prioritization of information needs of farm women in agriculture through PRA tools, personal interview and focus group discussions. An ICT Information corner was created in the DWCR building besides the Panchayat office. Computer, Internet and web- browsing facility

through data card was provided with the support of NAARM. The ICT user group of farmwomen and SHG members were imparted computer and internet skills for accessing the related information for their entrepreneurship needs in agriculture and homestead products. A Bank account with the Garmin Bank was opened for sustainability and accountability, at Aziz Nagar, Moinabad Mandal with the user group. This ICT centre is promoting good ICT practices and strategies for future agro-based and household enterprise activities. A hand on reference manual was also developed in collaboration with NAARM. This helped to investigate the existing use and preference of media by the farmwomen for sharing agriculture information and for e-business through entrepreneurial development, and, to develop strategy for information sharing and entrepreneurial development of farmwomen for agribusiness through e-extension, consumer preference analysis and analysis of livelihood capitals.

2. Characterization of drudgery of women in the production environment and assessment of technology packages in mitigating drudgery

Following tools/technologies were developed/refined by different centres during the period under report

Sac for performing manual fertilizer application - VNMKV, Parbhani

The fertilizer application is an important agriculture task carried out by both women and men as observed in Marathwada region. Fertilizer application task is performed continuously for 2 to 5 hours with single hand. It is also drudgery prone like threshing, weeding, winnowing etc. The need to design fertilizer application sack was expressed by the farm women as existing method of carrying fertilizer in a basket. The activity was performed in bending or standing posture in which women experienced pain in hand, back and cervical regions. Considering the problem the Sac was designed to carry solid fertilizer. Work output was measured in terms of unit time/labourer/acre area under fertilizer application. It was found that there was significant reduction (25%) in time required to complete manual broadcasting in one acre area by improved method. Repetitive strain was significantly reduced with the sac as both hands of worker were used for fertilizer application. Musculoskeletal discomfort and perceived exertion of farm women in manual fertilizer application and seed drill method were significantly reduced. Hence sac developed by VNMKV, Parbhani centre was found to be ergonomically useful accessory in manual fertilizer application activity.



Potato Picker – CSKHPKV, Palampur

Potatoes are grown as major crop in hilly area. Potato picking is mainly performed by women and is a frequently performed task. Potatoes are collected and picked one by one by hands in squatting and bending posture, which is a time consuming and tedious activity. An improved potato picker was developed as per anthropometric dimensions of hill farm women. The handle length of the potato picker is 72.5 cm. A metallic wired frame has been attached to the handle which is used for collecting the harvest. The width of the frame is 26 cm and the length is 32 cm. The tool weighs 2 kgs. The use of potato picker helps in picking up bulk of potatoes together. The use of potato picker improves the body posture from squatting to bending thereby enhancing better health of the women worker. The use of improved potato picker has increased the efficiency of the workers in terms of kg of potatoes picked up in a single pick. The results revealed reduction in the calculated Cardiac Strain Index (CSI) while picking of potatoes in the traditional method (25 beats) as compared to the use improved tool (13.33 beats).



Ergonomic evaluation of grain picker

Grain picker developed by G.B. Pant Agricultural University, Pantnagar, Uttarakhand was demonstrated in

the adopted villages of Hissar, Madurai, Prabhani, Ludhiana, Pantnagar and Udaipur. It had been tried out for Rice and Dhal mill workers consisting of 105 respondents from all states.

Physical characteristics of the respondents involved in grain picking activity

N=105

S. No.	Parameters	Parbhani (VMMKV) (20)	Udaipur (MPUA&T) (05)	Pantnagar (GBPUA&T) (30)	Madurai (TNAU) (20)	Hissar (CCSHAU) (30)
		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
1.	Age (Years)	43.55 $\pm$ 12.65	25.4 $\pm$ 4.2	26.6 $\pm$ 9.17	47.65 $\pm$ 8.00	35 $\pm$ 6.3
2.	Height (cm)	151.83 $\pm$ 4.62	157.6 $\pm$ 0.1	163.2 $\pm$ 7.45	154.58 $\pm$ 4.15	152.4 $\pm$ 2.4
3.	Weight (kg.)	48.77 $\pm$ 6.71	48.2 $\pm$ 9.6	53.2 $\pm$ 7.29	53.57 $\pm$ 10.44	48 $\pm$ 4.3
No. of years of working in field						
1	Up to 8 years	12 (60%)		12 (40%)		2(6.7) $\pm$ 0.7
2	10–20 years	7	11.8 $\pm$ 4.1	18 (60%)	19.10 $\pm$ 7.11	21(70.0) $\pm$ 3.1
3	More than 20 years	1	-	-	-	7(23.3) $\pm$ 2.5
4	Working hours/day	8	8	10	9.25 $\pm$ 1.48	
BMI						
1	Under weight (18.5 or less)	5 (25%)	0	10 (33.33%)		4(13.3) $\pm$ 0.2
2	Normal weight (18.5 to 24.99)	15 (75%)	4 (80%)	18 (60%)	100%	24(80.0) $\pm$ 1.2
3	Over weight (25 to 29.99)	-	1 (20%)	-	-	2(6.7) $\pm$ 0.1
4	Obesity (class 1) (30 to 34.99)	-	0	2 (6.66%)	-	-
5	Obesity (class 2) (35 to 39.99)	-	0	-	-	-
6	40 or greater (Morbid Obesity)	-	0	-	-	-

The mean age of the subjects involved in grain picking activity was 47 years in Madurai followed by 43.55 years in Parbhani and 35 years in Hissar. Respondents in Udaipur (25.4 yrs.) and Pantnagar (26.6 yrs.) are in younger age group. (Table-11& fig-1.2) Their average working hours per day was found between 8 to 10 hrs.

Majority of the respondents were having work experience in the range of 10 to 20 years followed by 8 years of work experience as reported by 40 per cent respondents of Pantnagar and 60 per cent respondents of Prabhani respectively. Few of the respondents were having work experience of more than 20 years.

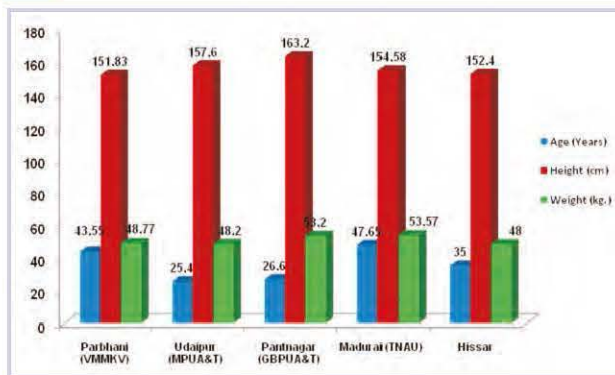


Fig: 1.2 Physical Characteristics of the respondents involved in grain picking activity

So far as the body mass index of the subjects is concerned, table-2 and fig:2 reveals that the respondents in Hissar, Madurai, Udaipur, 75 per cent in

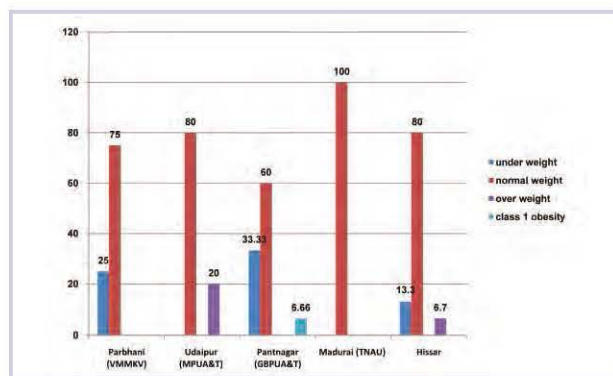


Fig: 1.3

Parbhani and 60 per cent of the respondents in Pantnagar fell in the category of normal BMI whereas few of respondents were having class 1 obesity.

Time and work study

S. No.	Parameters	Parbhani (VMMKV)		Udaipur (MPUA&T)		Pantnagar (GBPUA&T)		Hissar (CCSHAU)		Madurai (TNAU)	
		CM	IM	CM	IM	CM	IM	CM	IM	CM	IM
1.	Weight of grain picked / lift (kgs)	4.34	4.67	4.334	3.34	8.28	7.66	13	5	3.15	5.23
2.	No. lift / min. (kgs)	16	14	12	15.2	57.20	45.96	2	5	25.75	33.75
3.	Picking efficiency (%)	7 %		20.65				19.7%		-66.86%	
4.	Production / hrs (q.)	38.98	40.62	1.45	2.12	7.87	5.51	15.6	15	48.79	105.8
5.	Rating on time load	2.5	2.0	-	-	-	-	-	-	-	-
	a. Very slow-5 b. Slow -4 c. Moderate- 3 d. Fast- 2 e. Very fast -1	-	-	3	2	1.5	1.5	3.5	2.9	-	-

* Conventional Method = CM, Improved Method = IM

The mean weight of grain picked per lift ranges from 3.15 kg to and 13 kg and 3.14 Kg. to 7.66 Kg. for the conventional and improved method respectively. The

rating on time load in all 5 states was found between 1.5 to 2.9 using improved method in comparison to the range of 1.5 to 3.5 in conventional method. (Table-12)

Assessment of postural discomfort

N=20

S. No.		Subject	Conventional Method		Improved Method	
			ODR	BPDS	ODR	BPDS
1.	Parbhani (VMMKV)	Group-I	8	94	7	88
		Group-II	8	99	6	93
		Group-III	7	84	6	77
		Group-IV	8	91	7	83
		Mean $\pm$ SD	7.75 $\pm$ 2.5	92 $\pm$ 6.27	6.5 $\pm$ 0.57	85.25 $\pm$ 6.84
2.	Udaipur (MPUA&T)	Group-I	9	4.5	5	3
		Group-II	10	4.8	4	3.4
		Group-III	8	3.9	5	3.6
		Group-IV	9	4.6	6	3.2
		Group-V	8	5	6	3.1
		Mean $\pm$ SD	8.8 $\pm$ 0.84	4.56 $\pm$ 0.42	5.2 $\pm$ 0.84	3.26 $\pm$ 0.24
3.	Pantnagar (GBPUA&T)	Mean	7.5	22.33	6.5	7.66
		SD	$\pm$ 0.9	$\pm$ 6.62	$\pm$ 0.9	$\pm$ 0.81
4.	Hisar (CCSHAU)	Mean	7	6	5.9	5.5
		SD	$\pm$ 0.9	$\pm$ 0.9	$\pm$ 0.9	$\pm$ 0.9

ODR- Overall Discomfort rating, BPDS- Body part discomfort score

When inquired about the musculoskeletal disorders of the respondents in conventional grain picking activity, symptoms reported were pain and stiffness in upper and lower limb such as shoulder, upper arm, elbow, lower arm, wrist, palm and fingers in all states. All the respondents in Madurai reported that the pain was bearable whereas tolerance of the pain was ignorable at Pantnagar.

Body part discomfort (BPDS) was studied through use of Human Body Map (Corlett & Bishop, 1976) at 5-point scale. The critical points of discomfort as reported by the respondents were shoulders, upper arms, wrist, palm, fingers and lower back, fingers, hands and wrist. Maximum reduction in BPDS was recorded in hands using improved method followed by fingers and palm. Overall discomfort rating as reported by the respondents of 5 states in conventional and improved method had a

ranged from 7 to 8.80 and 5.2 to 6.5 respectively, depicting activity with improved method was less tiring. (Table 13)

Hence, it can be concluded that improved tool was readily accepted by the workers due to their efficiency and reduction in MSDs. The improved method of grain picking activity could be recommended due to improved in the picking efficiency and minimum reduction in grip strength which resulted in reduced physiological cost of work.

Grain Picker was demonstrated in the adopted villages of other centres namely; Hisar, Madurai, Prabhani, Ludhiana, Pantnagar and Udaipur. It was evaluated for 105 Rice and Dhal mill female workers of above cited states.

Assessment of postural discomfort

S. No.	Centre	Subject	Conventional Method		Improved Method	
			Overall Discomfort Rating (ODR)	Body Part Discomfort (BPDS)	Overall Discomfort Rating (ODR)	Body Part Discomfort (BPDS)
1.	VMMKV, Parbhani	Mean $\pm$ SD	-	92 $\pm$ 6.27	6.5 $\pm$ 0.57	85.25 $\pm$ 6.84
2.	MPUA&T, Udaipur	Mean $\pm$ SD	8.8 $\pm$ 0.84	4.56 $\pm$ 0.42	5.2 $\pm$ 0.84	3.26 $\pm$ 0.24
3.	GBPUA&T, Pantnagar	Mean $\pm$ SD	7.5 $\pm$ 0.9	22.33 $\pm$ 6.62	6.5 $\pm$ 0.9	7.66 $\pm$ 0.81
4.	CCSHAU, Hisar	Mean $\pm$ SD	7 $\pm$ 0.9	6 $\pm$ 0.9	5.9 $\pm$ 0.9	5.5 $\pm$ 0.9

Carrot Greens Cutter – CCSHAU, Hisar

Traditionally carrot greens are being harvested by the rural woman with the help of knife and task is done for the whole day which is drudgery prone and tedious, leading to severe pain in hands. Hence, a carrot green cutter was developed and was tested ergonomically. Output was increased by 14 per cent using carrot green cutter than the conventional method. Carrot green cutter was found to be useful in reducing the drudgery of women in terms of body part discomfort score. There was reduction in BPDS in upper arms (17.5%), neck (13.7%), head (12.5%) and shoulder joints (12.3%). Overall acceptability of the tool was 74.5 per cent making it acceptable as perceived by the respondents.



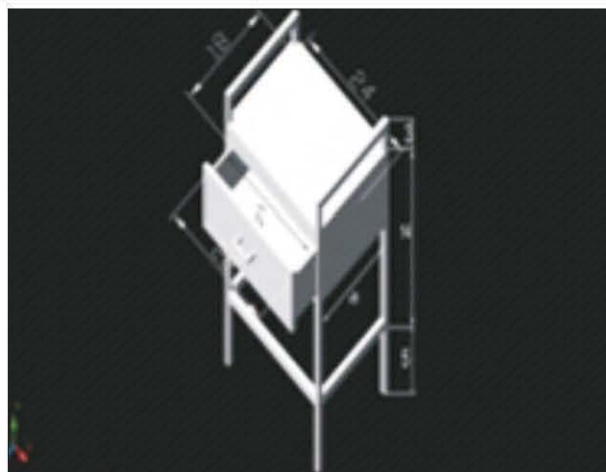
Ergo stool for pruning and harvesting in grape production – CCSHAU, Hisar (PHOTO)

Ergo stool for pruning and harvesting consisted of a platform made up of wood. It is provided with two drawers to store items such as water bottle, secateurs,

blade, scarf, scissor etc. Its legs are made up of steel and are strong. On three sides of stool, steel support was provided at 5" from the floor level which helps to step up on the stool. Handles are also made up of steel that helps to hold it and also to step up on the stool.

Specification of Developed ergo stool for pruning and harvesting

Height – 22"	Length of rack for storing tool accessories – 21"
Width – 24"	Step height – 5"
Length – 18"	Drawers (i) LxWxH = 17x16x6
Handle length – 18"	(ii) LxWxH = 16x4x5



The acceptability of ergo stool for pruning and harvesting was obtained from 10 grape orchard workers. Ranks were computed on the basis of mean score

obtained and has been presented in Fig.40. Good appearance as well as acceptable for use, scored highest rank (I rank, each) followed by comfortable body posture during work and avoids shoulder pain (II rank, each). Good replacement to the existing stool secured 3rd rank.

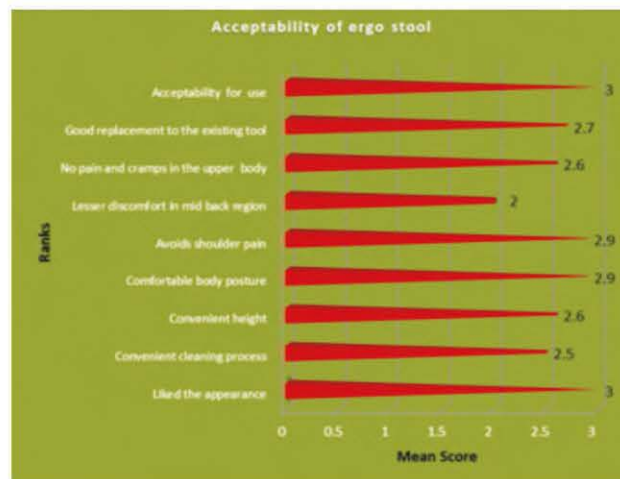


Fig.40 :Acceptability of Ergo stool

Seed Drill -PJTS AU, Hyderabad

Traditional way of sowing seeds in a farm is a tough job and women labor dependent activity whereas manual seed drill is useful for sowing the seeds at equal distances and at proper depth, ensuring that the seeds get covered with soil. In addition to saving labour time and energy, it can also reduce in extreme forward trunk flexions for mitigating drudgery of women. Evaluation at Hyderabad, Telangana revealed that mean time for sowing seeds per acre using seed drill was reduced compared to conventional method. Women felt that the use of seed drill was less physically exhausting, time saving and postural convenient. Therefore, it can be recommended for use by women with hourly pauses while at work for recouping on



Medium Hoe for Bundling and weeding in maize crop – CSKHPKV, Palampur

Intercultural operations like bundling and weeding in maize crop is done with a heavy tool locally known as khutti. For easy operations by women, a small tool was designed called medium hoe consisting of curved blade made up of cast iron and a wooden handle that is fitted into the ring attached to the blade. The front edge of the blade is sharpened and made flat so that the soil can be easily pulled towards the plant. The weeds are also pulled out with the help of this tool. Farm workers were found satisfied with this design of medium hoe and no modifications were suggested by women in the medium hoe as it improved the workers efficiency.



Specification of Medium Hoe	
Handle length (cm)	38
Blade length (cm)	15
Width of Blade (cm)	12
Weight of Tool (kg)	0.42

Twenty-eight technologies were up scaled as per the need and for introduction among SHG groups viz., brinjal mittens (63 pairs), okra mittens (63 pairs), cotton picking apron (1 no.), sulbha bag (fertilizer carrying bag) (4 nos.), maize sheller (1 no.), face protective mask (2 nos.), noise and dust controlling mask (19 nos.), trishul weeder (6 nos.), revolving milking stand & stool (169 sets), soybean mittens (108 pair), modified sapling transplanter (16 nos.), sapling carrier bag (6 nos.), winnowing fan (1 no.), paddy thresher (2 no.), fodder chopper (1 no.), potato picker (1 no.), potato uprooter (1 no.), medium hoe (1 no.), bamboo strip smoothener (1 no.), mat nursery (8 nos.), improved grain spreading tool (30 nos.), improved sickle (20 nos.), improved khurpi (15 nos.), grain picker (20 nos.), dung collector (65 nos.), water bag (83 nos.), face protector (15 nos.), and grain stripper (6 nos.).

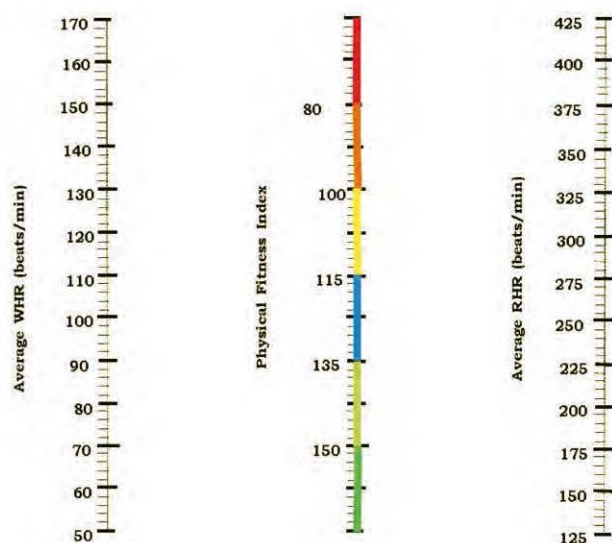
Technologies were evaluated and upscaled as per the need and preferences by farm women are given below:

Preferences for technology by women on field validation

CSKHPKV Palampur	Activity	No. of users	Name of technology field tried	No. of farmer preferring the conventional method only	No. of farmer preferring the improved method	New innovations tried by the farmers	Any suggestions for modifications in improved technology
Women	Bundling in maize	30	Medium Hoe	-	30	30	No suggestion

3. Evolving Nomograms to Predict Acceptable Work load of Women in Farming Systems

Nomogram for the assessment of physical fitness index of the respondent was based on the values of average working heart rate and average recovery heart rate. With step stool method, value of physical fitness index. For this purpose data were collected from 3200 employee's physical fitness and on the basis of that data, nomogram for assessing the physical fitness of respondents was developed.



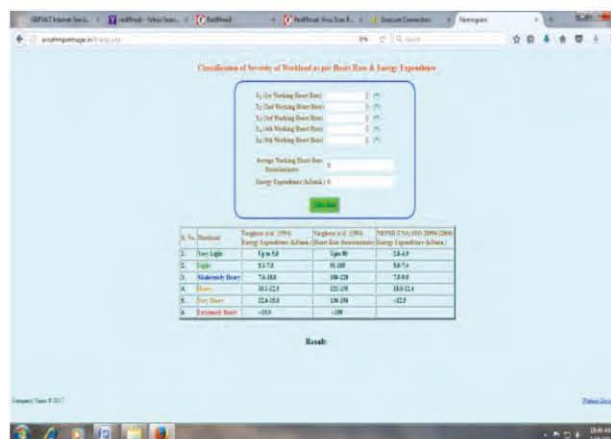
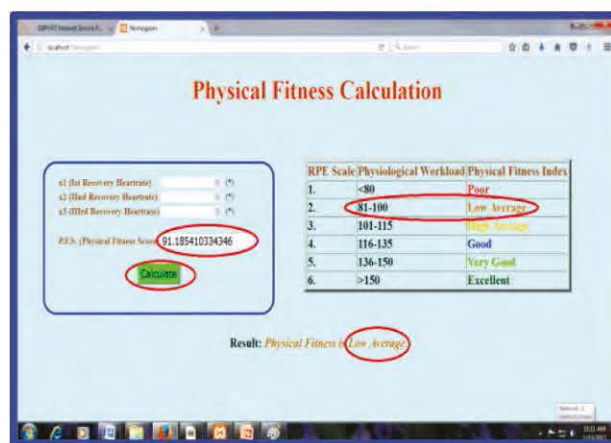
Nomogram for assessing the physical fitness of the respondent

Physical fitness of the respondent

Sl.	Physiological Workload	Physical Fitness Index	Colors
1.	Upto 80	Poor	Red
2.	81-100	Low Average	Orange
3.	101-115	High Average	Yellow
4.	116-135	Good	Blue
5.	136-150	Very Good	Light Green
6.	Beyond 150	Excellent	Dark Green

The category of physical fitness of the respondents with step stool method and the category of physical fitness of the respondents with the nomogram was approximately same but there are 20 – 30 per cent chances of variation because the main purpose of nomogram is to represent the relationship of various variables in graphical form (Table 3).

To overcome the difficulties of nomogram since, there was variation in the values of "pant physical Fitness Software" was developed for testing the physical fitness of the respondents. This software is available in the web address at www.aicrpfmpantnagar.in for easy access.



Food based strategies to combat nutritional problems among farm families

Impact of nutrition education on haemoglobin level of adolescent girls

Intervention programmes were carried out through demonstration, awareness creation and nutrition

education was imparted to overcome anaemia situation among selected girls and data on haemoglobin count was collected before and after nutritional intervention. Before and after nutrition intervention, the mean haemoglobin level (gm/dl) of adolescent girls (n = 150 control + 150 experimental for each centre) are presented below:

Impact of nutrition intervention on mean haemoglobin level (gm/dl) of adolescent girls

Centres	Groups	Before intervention	After intervention	% increase or decrease	S/NS
AAU	Control	9.56 ± 1.41	9.27 ± 1.35	-3.03	NS
	Experimental	10.01 ± 1.08	11.18 ± 0.77	11.68	S
PJ TSAU	Control	10.48 ± 1.60	9.16 ± 1.32	-12.59	S (-)
	Experimental	9.24 ± 1.66	10.42 ± 1.31	12.77	S
CCSHAU	Control	9.86 ± 0.99	9.12 ± 3.16	-1.29	NS
	Experimental	9.80 ± 0.65	10.03 ± 2.36	2.35	NS
CSKHPKV	Control	10.67 ± 0.96	10.43 ± 0.60	-2.25	NS
	Experimental	9.88 ± 0.67	10.04 ± 0.37	1.61	NS
GBPUAT	Control	10.17 ± 1.16	9.62 ± 4.05	-5.40	NS
	Experimental	10.71 ± 1.36	12.00 ± 1.54	12.04	S
MPUAT	Control	10.57 ± 1.36	11.10 ± 1.93	5.01	S
	Experimental	9.49 ± 0.87	10.21 ± 0.71	7.58	S
VNMKV	Control	9.31 ± 0.87	9.32 ± 0.88	0.10	NS
	Experimental	9.78 ± 1.10	10.84 ± 0.59	10.83	S
PAU	Control	10.03 ± 1.09	9.41 ± 0.97	-6.18	NS
	Experimental	9.78 ± 1.10	10.84 ± 0.59	10.83	S
UAS	Control	10.90 ± 1.10	11.48 ± 1.56	5.32	S
	Experimental	10.85 ± 0.95	11.45 ± 1.13	5.53	S
TNAU	Control	9.60 ± 1.10	9.96 ± 1.40	3.75	NS
	Experimental	9.71 ± 1.30	10.77 ± 1.48	10.91	S
Mean of all centres	Control	10.11 ± 0.51	9.89 ± 0.80	-2.17	NS
	Experimental	10.01 ± 0.51	10.77 ± 0.60	7.59	S

S – Significant at 5% level; NS – Not significant

The data of Table 14 revealed that majority of the adolescent girls were found to be anaemic before nutrition intervention with mean ($\pm$ SD) haemoglobin level of 10.11 ± 0.51 gm/dl and 10.01 ± 0.51 gm/dl in control and experimental group respectively, which were below the standard defined by WHO (12 gm/dl). There may be many possible causes of iron deficiency anaemia among the adolescent girls of the targeted population like low intake of iron rich food, low food intake, depleted iron stores/iron loss, low dietary bioavailability etc.

The mean haemoglobin level of adolescent girls in the experimental group increased significantly from 10.01 ± 0.51 to 10.77 ± 0.60 gm/dl with 7.59 per cent increment from baseline haemoglobin level after nutrition intervention while in the control group a non significant decrease was seen from 10.11 ± 0.51 to 9.89 ± 0.80 gm/dl with 2.17 per cent declination from baseline haemoglobin level. The highest increment of the mean haemoglobin level was seen in the PJ TSAU centre from initial mean haemoglobin level of 9.24 ± 1.66 gm/dl to final 10.42 ± 1.31 gm/dl (12.04%) and lowest was found

in the CSKHPKV centre from 9.88 ± 0.67 gm/dl to 10.04 ± 0.37 gm/dl (1.61%). Study revealed that the mean haemoglobin level of the experimental group was comparatively higher than control group after education intervention. This may be due to educational intervention, which improved the dietary habits. Hence, the nutrition education is one of the relevant, effective and sustainable strategies to combat anaemia.

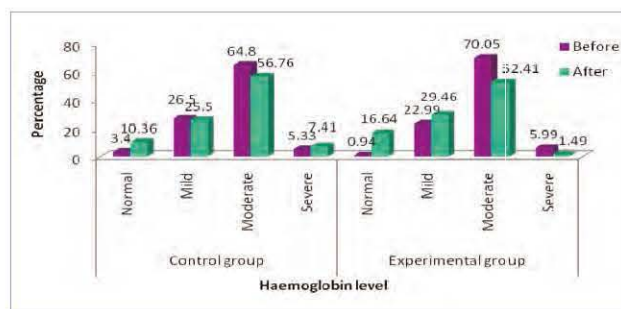


Fig 1.4: Percentage distribution of the adolescent girls on the basis of haemoglobin level

Fig 1.4 shows the distribution of the adolescent girls on the basis of haemoglobin level into different degree of anaemia. The data revealed that before nutrition intervention more than half of the adolescent girls (64.80%) in control group (150 samples each centre) and 70.05 per cent in experimental group (150 samples each centre) were moderately anaemic. About 26.50 per cent and 22.99 per cent were found to be mildly anaemic while 5.33 per cent and 5.99 per cent adolescent girls were severely affected in control and experimental group respectively before nutrition intervention. Only 3.40 per cent in control group and 0.94 per cent in experimental group were found to be normal.

Anthropometric Assessment

Anthropometric indices play a major role in assessing the nutritional status of an individual at various age groups. The mean BMI of the adolescent girls were calculated by using WHO percentile values for adolescents. The mean BMI ranged from 15.58 (CSKHPKV centre) to 21.68 (Uttarakhand centre). Majority of the adolescent girls were underweight (51.06%) followed by normal (45.27%) and overweight and obese samples are very less in all the ten centres (Fig-49).

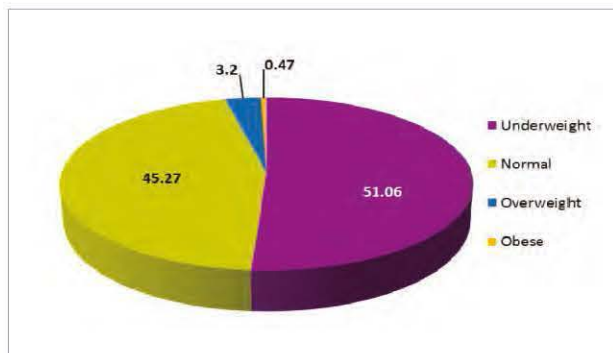
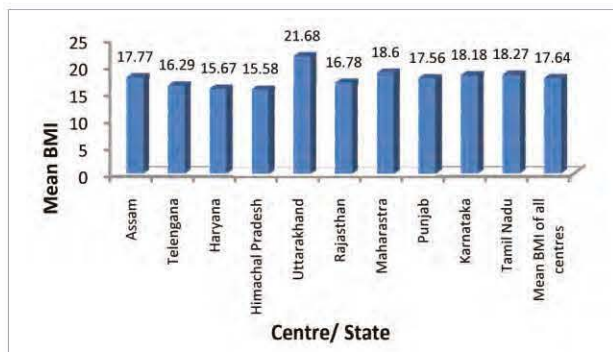


Fig 1.5: BMI of the adolescent girls

Clinical signs and symptoms

Clinical assessment is used in nutritional survey of population groups because it involves assessment of the health of earlier general noticeable symptoms. The overall mean of the clinical signs and symptoms present in adolescent girls of all the centres is presented.

Mean clinical symptoms present among the adolescent girls of all the centres

Clinical symptoms		No.	Percentage
Hair	Lack of luster	620	20.67
	Thinness and sparse	342	11.40
	Straightness	245	8.17
	Dys-pigmentation	328	10.93
	Flag sign	107	3.57
	Easy pluck ability	352	11.73
Eye	Pale conjunctiva	637	21.23
	Bitot's spot	54	1.80
	Conjunctival xerosis	29	0.97
	Corneal xerosis	28	0.93
	Keratomalacia	17	0.57
	Angular palpebritis	11	0.37
Lips	Angular stomatitis	94	3.13
	Angular scars	52	1.73
	Cheilosis	64	2.13

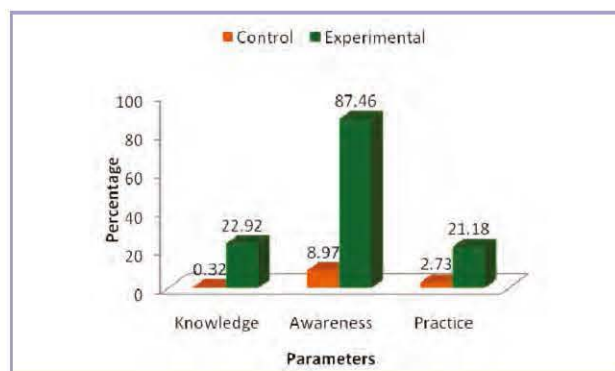
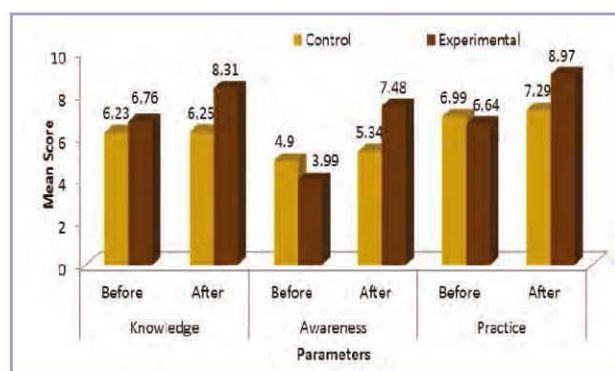
Clinical symptoms		No.	Percentage
Tongue	Oedema	4	0.13
	Scarlet and raw tongue	146	4.87
	Magenta tongue	65	2.17
	Atropic papillae	93	3.10
Teeth	Mottled enamel, cavity	476	15.87
Gums	Spongy, bleeding gums	141	4.70
Glands	Thyroid enlargement	11	0.37
	Paratid enlargement	2	0.07
Skin	Xerosis	40	1.33
	Follicular hyperkerotosis	19	0.63
	Type-1 & type-2 petechiae	21	0.70
	Pellagrous dermatosis	14	0.47
	Flaky paint dermatosis	24	0.80
	Scrotal & vulval dermatosis	3	0.10
Nail	koilonychia	154	5.13

In Punjab centre, all clinical signs and symptoms were present in various degrees among the adolescent girls, whereas no clinical signs and symptoms were seen in adolescent girls of Rajasthan centre. In Assam, Haryana, Himachal Pradesh and Karnataka centre, few signs and symptoms such as pale conjunctiva, mottled enamel and cavity, spongy bleeding gums, lack of luster in hair, skin xerosis and koilonychia were seen. Lack of luster in hair, pale conjunctiva, mottled enamel and cavity are common clinical signs and symptoms among adolescent girls (table 32)



Assessment of Knowledge, Awareness and Practice (KAP) among adolescent girls

The impact study of KAP on nutritional education of adolescent girls of ten centres of AICRP on Home Science were studied in a 10 point scale with both the control and experimental groups. Result revealed that control group had higher rank in awareness and practice parameters (4.9,6.99) compared to the experimental group. But in case of knowledge parameter the experimental group is better (6.76) than the control group. After intervention KAP parameters of the experimental group were increased as compared to control group. That was also reflected in the percentage gain in KAP of adolescent girls i.e., 21.18, 22.92, 87.46 respectively.



Impact of nutrition education on food intake of the adolescent girls

Diet survey provides information about dietary patterns, specific foods consumed and estimated nutrient intake. It constitutes an essential part of complete study of nutritional status of individual or groups. The diet survey was conducted by 24 hours dietary recall method and converted to nutrient intake using software developed at AIIMS, New Delhi. Adequacy was determined comparing with Recommended Dietary Allowances (RDA) by ICMR.



In the present study the mean intake of most of the nutrients was less than the Recommended Dietary Allowances (RDA). Among all the ten centres the mean nutrient intake for control group ranges from 19.96 ± 6.21 in Sugar & Jaggery and 253.84 ± 63.21 in cereal, so in case of experimental group the mean nutrient intake for experimental group ranges from 20.48 ± 6.09 (fat & oil) and 247.19 ± 62.07 in cereal before intervention. The mean nutrient intake for control group ranges from 18.54 ± 5.64 in sugar & jaggery and 256.68 ± 55.30 in cereal and in experimental group the nutrient intake of adolescent girls ranges from 20.24 ± 5.77 in sugar & jaggery and 272.58 ± 59.26 in cereal after intervention (Table-16).

Total Mean food intake by adolescents girls

N=		Food Intake		
Centres	Groups	Before intervention	After intervention	% increase or decrease
		Mean $\pm$ SD	Mean $\pm$ SD	
Cereal	Control	253.84 ± 63.21	256.68 ± 55.30	0.25
	Experimental	247.19 ± 62.07	272.58 ± 59.26	10.27
Pulses and legumes	Control	44.26 ± 14.63	44.79 ± 11.87	1.19
	Experimental	42.46 ± 15.21	47.56 ± 12.46	12.01
Milk & Milk products	Control	189.16 ± 93.71	192.54 ± 110.78	1.78
	Experimental	177.06 ± 117.00	232.73 ± 135.02	31.44
Roots and tuber	Control	59.67 ± 25.43	61.50 ± 18.86	3.06
	Experimental	53.14 ± 23.82	65.04 ± 17.75	22.39
Green Leafy vegetables	Control	34.25 ± 24.23	32.13 ± 27.07	-6.18
	Experimental	34.66 ± 24.82	49.49 ± 26.23	42.78
Other vegetables	Control	55.90 ± 20.02	72.14 ± 36.29	29.05
	Experimental	54.63 ± 21.94	87.76 ± 35.48	60.64
Fruits	Control	34.82 ± 31.39	45.47 ± 32.98	30.58
	Experimental	29.43 ± 28.90	59.79 ± 39.89	71.71
Sugar & Jaggery	Control	19.96 ± 6.21	18.54 ± 5.64	-7.11
	Experimental	21.72 ± 8.06	20.24 ± 5.77	-4.84
Fats & Oil	Control	21.21 ± 5.70	22.77 ± 4.77	7.35
	Experimental	20.48 ± 6.09	22.24 ± 4.36	8.59

Impact of nutrition education on nutrient intake of adolescent girls

The results on impact of nutrition education on intake of major nutrients such as energy, protein, fat, calcium, iron, retinol.

Impact nutrition education on nutrient intake of adolescent girls

Nutrient intake	Groups	Nutrient Intake		
		Before intervention	After intervention	% increase or decrease
		Mean $\pm$ SD	Mean $\pm$ SD	
Energy	Control	1530.36 $\pm$ 384.26	1567.89 $\pm$ 277.67	2.45
	Experimental	1539.81 $\pm$ 448.63	1755.71 $\pm$ 385.48	14.02
Protein	Control	41.87 $\pm$ 7.53	42.51 $\pm$ 5.91	1.53
	Experimental	41.52 $\pm$ 9.96	45.94 $\pm$ 7.25	10.65
Fat	Control	33.97 $\pm$ 8.00	36.74 $\pm$ 10.41	8.15
	Experimental	34.41 $\pm$ 9.58	40.21 $\pm$ 7.49	16.86
Calcium	Control	511.91 $\pm$ 244.57	499.59 $\pm$ 199.36	-2.41
	Experimental	490.11 $\pm$ 304.87	608.85 $\pm$ 289.14	24.23
Iron	Control	12.51 $\pm$ 4.50	13.83 $\pm$ 5.73	10.55
	Experimental	12.94 $\pm$ 5.23	16.25 $\pm$ 7.25	25.58
Retinol	Control	154.50 $\pm$ 73.01	154.05 $\pm$ 80.24	-0.02
	Experimental	161.80 $\pm$ 80.16	167.81 $\pm$ 74.25	3.71

Impact of nutrition education was significantly visible in all experimental groups compared to control groups (2.41 to 10.55%) in were in intake.

4. Mitigating Occupational Hazards

4.1 Functional Clothing to Combat Occupational Health Hazards of Farm Workers

For combating occupational health hazards functional clothing kits viz., Five sets of *kurta-pajama*, Head gear with mask, Protective shirt and Pant, Gloves, Mouth mask, Ear muff, Apron, Protective *kurta* with & without hood, Traingular face mask, Knitted fabric face cover

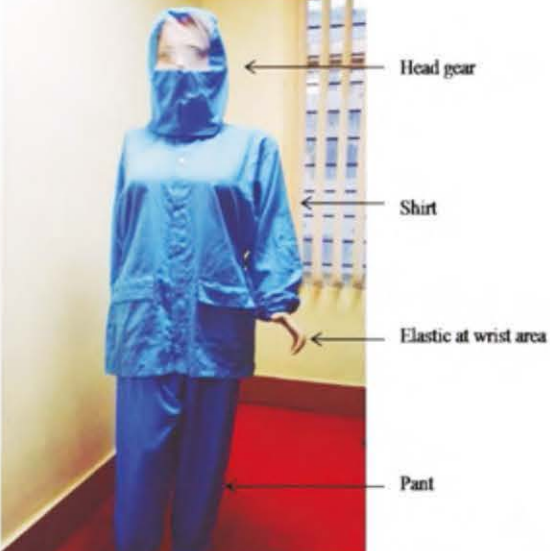
were designed and developed for the workers engaged in different activities in agriculture, agriculture allied sectors & textile sector and assessed for its suitability and acceptability among workers through wear trials

4.1.1.1 Suitability and acceptability

To mitigate health hazards an attempt was carried out at the field level to observe the suitability and acceptability of these protective clothing.

4.1.1.2 Designed and developed protective clothing for agriculture sector

Details of developed protective clothing and their suitability assessment

Developed clothing	Wear trial of designed and developed protective clothing
 Plate 1: Kurta-pyjama developed by P.A.U. Ludhiana	 Plate 2: Picking of <i>ber</i> fruit using protective Kurta Pyjama
Suitability assessment Ludhiana center designed five sets of <i>kurta-pajama</i> using different fabrics namely nonwoven, suiting and canvas fabric. The suitability assessment of <i>kurta pajama</i> (Plate-2) was done on 15 respondents through wear trial using three point scale for the parameters namely ease in putting on and off, ease in working, protection	against thorns, acceptability, durability and overall impact. It was observed during wear trial that <i>kurta-pajama</i> from nonwoven fabric (70 GSM) obtained highest aggregated Weighted Mean Score (WMS) score 2.3, hence found to be the best with regards to suitability for plucking of <i>ber</i> fruit.
 Plate 3: Functional clothing kit developed by AAU, Jorhat	 Plate 4: Wear trial of functional clothing kit among paddy harvesters
Suitability assessment Jorhat center designed functional clothing kit (head gear with mask and protective shirt and pant) for the workers engaged in harvesting of paddy crop. The suitability (Plate-4) and acceptability assessment was	done by wear trial on 30 farm workers using three point scale for the parameter namely protection of body parts, comfort during work and easy to put on and off. It was interred that, the functional clothing kit was found highly suitable by the respondents.

Developed clothing	Wear trial of designed and developed protective clothing
 Plate 5: Gloves for sugarcane harvesters developed by GBPUAT, Pantnagar	 Plate 6: Wear trial of denim gloves among sugarcane harvesters
Suitability assessment Pantnagar center designed and developed denim fabric gloves for the sugarcane harvesters. The suitability assessment (Plate-6) was done on five	workers for consecutive three days. The respondents accepted the features of the gloves i.e. size assortment (length and width) and fit/ grip (wrist and fingers) with W.M.S. of 2.8.

4.1.1.3 Protective clothing for agriculture and allied sector.

Developed clothing	Wear trial of designed and developed protective clothing
 Mouth mask Ear muff Plate 7: Functional accessories developed by PJTSAU, Hyderabad	 Plate 8: Wear trial of mouth mask and ear muff
Suitability assessment Mouth mask and ear muff were developed for workers engaged in <i>masala</i> unit by PJTSAU, Hyderabad. The suitability assessment (Plate-8) of mouth mask and ear	muff was done on 30 farm workers using five point rating scale. On the basis of wear trial the mouth mask and ear muff obtained WMS of 4.0 for protection from inhalance of masala particales and sound pollution in chilli pulverizing unit.

Developed clothing	Wear trial of designed and developed protective clothing
 Plate 9: Functional clothing developed by CSKHPKV, Palampur	 Plate 10: Wear trial of kurta without hood and with hood among aata chakki workers
Suitability assessment Apron, Protective kurta with hood and without hood was developed by the Palampur center. The suitability and acceptability assessment (Plate-10) of apron, protective kurta with hood and without hood was done by wear trial on 15 aatachakki workers. The apron was	found highly suitable in terms of protection of front body parts from flour with WMS of 3.00 whereas the kurta without hood was found comfortable during work with WMS of 2.86 and the kurta with hood provided protection to neck from flour particles with WMS of 2.73.
 Plate 11: Face cover and mask developed by MPUAT, Udaipur	 Plate-12: Wear trial of developed triangular mask and knitted fabric face cover among flour and spice mill workers
Suitability assessment Triangular mask and knitted fabric face cover were developed by Udaipur center for the workers engaged in flour and spice mill. The suitability assessment (Plate-12) was done by wear trial on 10 respondents. Triangular mask and knitted fabric	face cover were found highly suitable. Aspects related to comfort, fabric for the mask and coverage area of the mask during wear trial were found to be highly suitable by the respondents. All the respondents were highly satisfied by the protective features.

4.1.1.4 Designed and developed protective clothing for textile sector

Details of developed protective clothing and their suitability assessment

 Plate 13: Apron developed by GBPUAT, Pantnagar	 Plate 14: Wear trial of developed apron among printing unit workers
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suitability assessment

Apron for workers engaged in textile printing unit was developed. The material used for development of apron was non- woven material which is used for packaging of rice.

The suitability and acceptability assessment (**Plate-14**) of apron was done by wear trial on 15 male respondents using three point rating scale. The apron was found to be suitable and comfortable with WMS of 3 and acceptable with weighted mean score of 2.

1. Utilization of plant sources for textile application

Storage study of gums and starches

Mango kernel starch

Storage study of mango kernel starch for six months revealed that was observed that there was no change in colour, odor and moisture content.

Cassia tora gum

Powder of *cassia tora* gum stored at room temperature and refrigerator was used in different concentrations for preparation of gum and tested for sedimentation volume.

Results revealed that reduction in viscosity, protein, carbohydrate, starch, total ash and moisture was more in

gum stored at room temperature as compared to refrigerated storage. Irrespective of the storage condition and packaging material gum lost its quality like viscosity and other important parameters which in turn hampered hinder its thickening and binding capacity as a printing paste.

St Thomas bean starch

Starch extracted from St. Thomas bean could be stored for three months without any physical changes and microbial growth.

Optimization of printing process with gums and starches

Natural dyes selected for printing of cotton and silk fabrics are given in the table 54:

Natural dyes used for printing with *cassia tora* gum and mango kernel starch

Botanical and Local name	English name	Part of plant	pH of dye extraction liquor	Testing Centre
• <i>Eclipta prostrata</i> (Gunta Galagara/Bhringraj)	Trailing Eclipta	Whole plant	Neutral	PJ TSAU, Hyderabad
• <i>Eucalyptus globulus</i> (Tailapatra)	Eucalyptus	Bark		
• <i>Bauhinia variegata</i> (Kachnar)	Orchid	Bark	Aqueous	HAU, Hisar
• <i>Lawsonia inermis</i> (Mehndi)	Heena	Leaves		
• <i>Eupatorium adenophorum</i> (Kali basuti)	Crofton weed	Leaves	Alkali	CSKHPKV, Palampur
• <i>Tagetes erecta</i> (Genda)	Marigold	Flowers	Acidic	UAS, Dharwad
• <i>Terminalia arjuna</i> (Arjun)	Arjun	Bark	Neutral	PAU, Ludhiana
• <i>Butea monosperma</i> (Tesu/kesula)	Flame of forest	Flowers	Aqueous	MPUAT, Udaipur
• Indigo dye	-	Leaves		
• <i>Acacia catechu</i> (Kattha)	Catechu	By product during production of kattha from <i>Acacia catechu</i>	Aqueous	GBPUAT, Pantnagar
• <i>Rubiacordifolia</i> (Manjistha)	Indian Madder	Bark		
• <i>Ficus religiosa</i>	Peepal sps	Bark	Aqueous	VNMKV, Parbhani

Cassia tora gum and mango kernel starch were used as thickener for preparation of printing paste. Prepared thickeners were used for printing of cotton and silk sample with natural and synthetic dyes.

Synthetic dyes used for printing with gums and starches

Dye name	Fabric	Center name
Rapid fast dye	Cotton	GBPUAT, Pantnagar
Acid	Silk	
Reactive dye	Cotton silk	CSKHPKV, Palampur
Direct dye	Cotton silk	PAU, Ludhiana

Fastness properties of screen and block printed samples against washing, sunlight, rubbing (dry and wet) and perspiration (acidic & alkaline) were tested. Both natural and synthetic dyes exhibited good to very good colourfastness on cotton and silk fabric using mango kernel starch and *cassia tora* gum. Printed products were developed by each centre (Plate 26 to Plate 30).

Optimization of printing processes with *Cassia sericea* gum and *Thomas bean* starch

Cassia sericea gum was extracted from the seeds of the fruit of *cassia sericea* plant. Printing process with *cassia sericea* gum was optimized for cotton and silk fabrics. Printed samples were tested for colourfastness and evaluated visually.

Printing on cotton and silk fabric was done with reactive dye using st. Thomas bean starch. The colourfastness of the samples printed with St. Thomas bean starch was found to be good with respect to washing, rubbing, sunlight and perspiration.

1. Capacity Building of Agrarian Families

Rural youth are the future of the agricultural sector. They play an important role in ensuring food security for future generations but they face many challenges. Recently, as a result of the 2007-2008 food crises there has been renewed attention by the international community not only to the agriculture but also to rural youth and their organizations. There is an urgent need to reflect on agricultural policies to ascertain business ideas and attractiveness of the youth. That's why capacity building of youth engaged in the agriculture is the need of the present scenario. By considering the above cited challenges the capacity building of agrarian families was badly needed. So, the parameters like academic backwardness, vocational interest for the youth to be identified for intervention to maintain quality life.

1.1 Developing competency of rural youth in agriculture through vocational intervention

Results indicated that students had good ability to recover from difficult situations which can be further improved through interventions such as skill development training, counseling, exposure visit etc.

5.1.3 Impact of interventions on external resilience of academically backward children

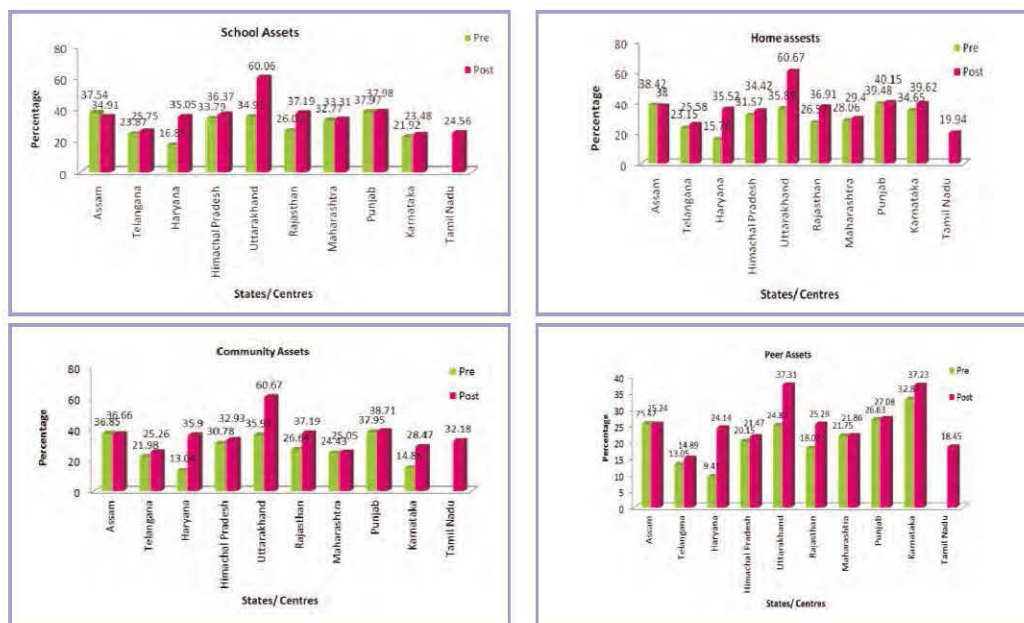


Fig.51 Impact of interventions on external resilience of academically backward children

With the interventions the mean value shows that the external resilience has increased in all the 4 dimensions and statistically significant differences were

also observed. Students from Assam and Ludhiana shows no significant difference between pre and post mean value except school assets (Fig. 51).

5.1.4 Impact of Intervention on Internal Resilience of academically backward children

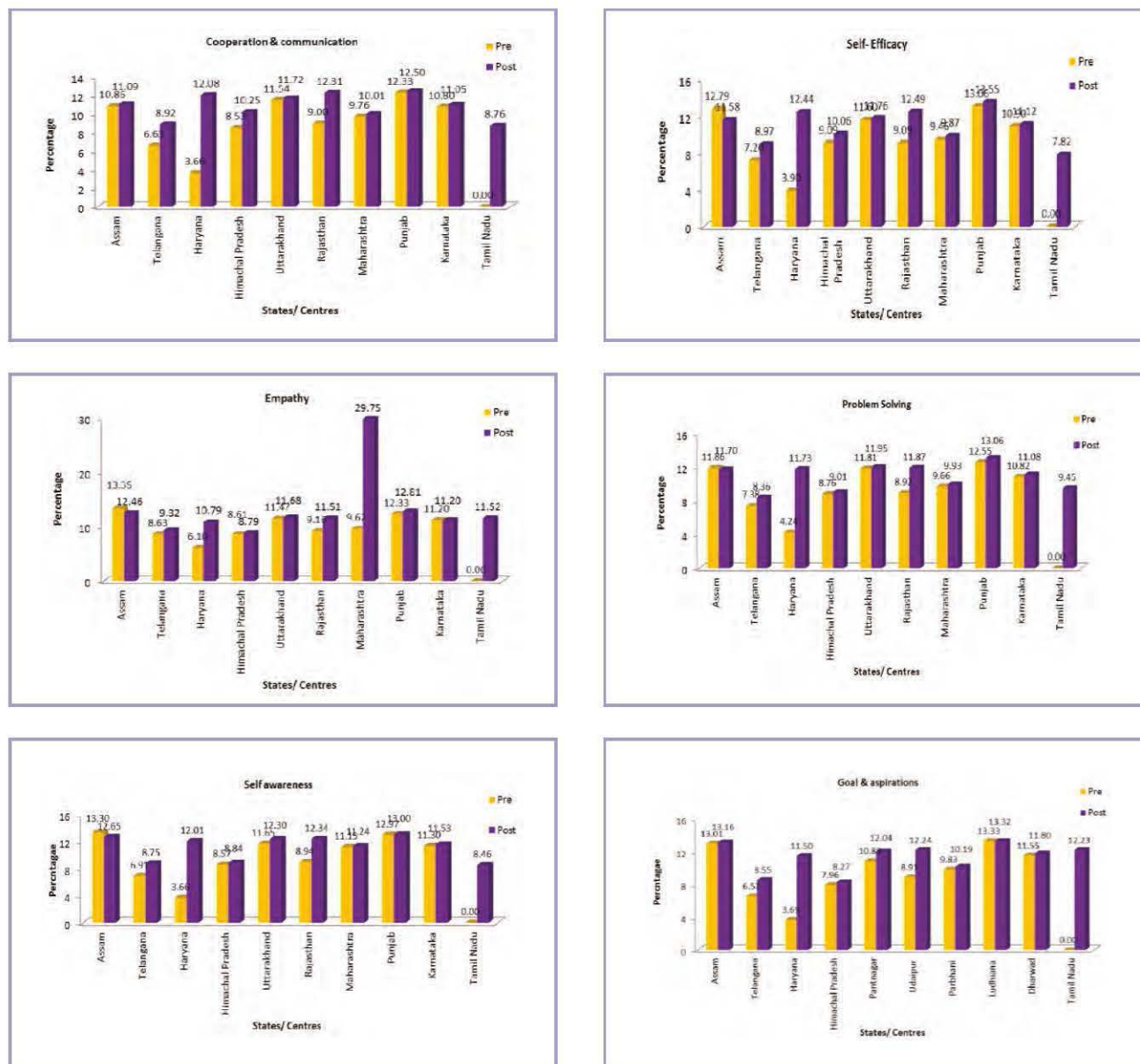


Fig.52: Impact intervention on internal resilience of academically backward children

With the impact of interventions Fig-52 the post-test mean scores envisaged that the Internal Resilience has increased in all the 6 dimensions and also significant differences were observed. A noteworthy result in self-

efficacy, empathy and self-awareness were found among students of Assam whereas no significant difference was seen in the subjects of Ludhiana in relation to all the dimensions.

Impact interventions of Socio-emotional problems of academically backward

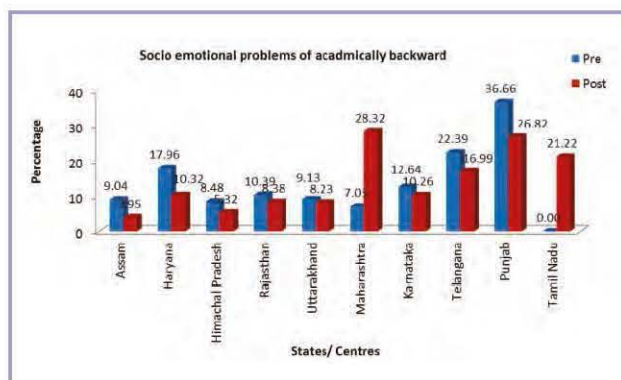


Fig.53 Socio-emotional problems of academically backward children

Result presented in the fig.53 shows that mean socio-emotional problems decreases and impact of intervention was statistically significant. It is clear that family is an important focus for prevention and treatment of emotional and behavioral problems among children. In fact, interventions given through the established counseling centres in operational villages. Since emotional and behavioral problems in early childhood tend to predict problems in later stage in life, so, interventions at early stage are needed to frame the personality development of young children of farm families to cope with the future emerging changing society. Besides, parenting intervention is also as important as for the young generation because they mould the all round development of their children. So counseling as well as interventions were carried out for the parents to increase their ability to nurture their children, who are the future assets of the nation.

Impact of Interventions on Vocational Interest of academically backward children

Sl. no	Areas		AAU, Jorhat (N=150)	CCSHAU, Hilar (N=150)	CSKHPKV, Palampur (N=150)	MPUAT, Udaipur (N=150)	GBPUAT, Pantnagar (N=150)	MAU, Parbhani (N=150)	UAS, Dharwad (N=150)	PJTSAU, Hyderabad (N=150)	PAU, Ludhiana (N=150)	TNAU, Madurai (N=150)
1.	Literary	Pre test	1.29 (1.75)	1.62 1.97	3.17 1.70	3.61 2.84	2.16 2.73	5.34 3.08	6.83 5.89	3.45 2.45	2.43 5.21	-
		Post test	0.62 0.85	2.14 2.23	3.17 1.70	3.35 4.60	1.28 2.26	5.34 3.08	7.52 6.02	2.96 1.95	4.23 5.15	4.52 1.25
		t value	0.32 ^{NS}	1.3 ^{NS}	1.2 ^{NS}	3.1 ^{NS} 1.2	NS	2.2 ^{NS}	1.0 ^{NS}	0.48 ^{NS}	1.32 ^{NS}	0.45 ^{NS}
2.	Scientific	Pre test	2.13 2.34	1.25 1.90	1.37 0.92	5.95 3.66	3.56 3.81	9.14 3.08	6.25 5.34	4.56 3.34	4.63 6.02	-
		Post test	0.98 1.08	1.86 2.17	1.39 0.91	5.49 5.64	2.11 2.31	9.14 3.08	6.81 5.3	2.41 1.24	2.48 5.26	3.15 1.16
		t value	1.0 ^{NS}	1.5 ^{NS}	0.7 ^{NS}	2.5 ^{NS}	1.36 ^{NS}	3.2 ^{NS}	0.91 ^{NS}	1.25 ^{NS}	2.46 ^{NS}	0.45 ^{NS}
3.	Executive	Pre test	1.78 1.95	0.99 1.91	0.61 0.67	4.18 2.59	3.67 4.13	6.93 3.20	6.60 6.4	1.72 0.65	2.45 1.85	-
		Post test	1.40 0.92	1.42 2.00	0.61 0.68	5.95 5.96	2.39 3.16	6.93 3.20	7.16 6.61	2.56 1.45	2.85 3.45	1.72 1.61
		t value	0.85 ^{NS}	1.0 ^{NS}	0.5 ^{NS}	2.8 ^{NS}	2.4 ^{NS}	2.1 ^{NS}	0.73 ^{NS}	0.15 ^{NS}	2.45 ^{NS}	1.0 ^{NS}
4.	Commercial	Pre test	0.94 1.35	0.74 1.24	1.72 1.61	3.79 4.01	1.87 2.57	9.86 3.95	5.25 5.57	4.85 6.34	0.29 2.45	-
		Post test	0.17 0.44	0.71 1.23	1.72 1.61	3.59 4.96	0.99 2.15	10.09 3.92	5.74 5.48	4.25 3.21	4.52 3.62	1.55 (2.33)
		t value	0.7 ^{NS}	0.9 ^{NS}	1.0 ^{NS}	2.3 ^{NS}	1.2 ^{NS}	2.1 ^{NS}	0.76 ^{NS}	1.62 ^{NS}	1.89 ^{NS}	1.3 ^{NS}
5.	Constructive	Pre test	1.24 1.66	2.20 2.17	1.96 1.34	3.64 3.81	1.85 2.29	11.63 (3.60)	4.46 5.05	4.65 3.84	2.85 1.36	-
		Post test	0.35 0.75	2.7 2.34	1.97 1.35	2.98 4.56	1.08 1.76	11.63 3.60	5.23 4.84	5.64 4.21	0.85 1.25	0.12 (0.33)
		t value	0.9 ^{NS}	1.6 ^{NS}	0.9 ^{NS}	2.5 ^{NS}	1.2 ^{NS}	2.2 ^{NS}	1.34 ^{NS}	1.23 ^{NS}	1.45 ^{NS}	0.95 ^{NS}
6.	Artistic	Pre test	1.66 (2.12)	1.53 (2.08)	0.89 (1.29)	2.48 (1.64)	3.03 (3.22)	11.11 (3.86)	6.42 (5.90)	3.77 (2.56)	1.29 (1.75)	-
		Post test	2.14 (1.28)	1.55 (2.33)	0.89 (1.29)	4.94 (5.36)	1.86 (2.51)	11.28 (3.75)	7.19 (5.88)	4.79 (3.07)	0.62 0.85	5.46
		t value	1.1 ^{NS}	1.3 ^{NS}	1.0 ^{NS}	2.5 ^{NS}	1.2 ^{NS}	2.1 ^{NS}	1.12 ^{NS}	1.5 ^{NS}	0.32 ^{NS}	2.56 ^{NS}
7.	Agriculture	Pre test	1.48 (1.82)	0.97 (1.53)	1.87 (1.32)	3.99 (3.43)	1.71 (2.40)	11.83 (3.44)	5.30 (5.98)	3.45 1.25	2.45 2.15	-
		Post test	0.12 (0.33)	1.7 (1.78)	1.87 (1.32)	3.31 (4.76)	1.14 (1.82)	12.05 (3.26)	6.54 (5.78)	4.56 3.45	0.86 4.65	4.23 3.25
		t value	0.95 ^{NS}	0.7 ^{NS}	0.95 ^{NS}	2.2 ^{NS}	1.2 ^{NS}	2.2 ^{NS}	1.82 ^{NS}	1.54	1.86 ^{NS}	1.42 ^{NS}
8.	Persuasive	Pre test	1.11 (1.43)	1.19 (1.64)	0.61 (0.98)	3.20 (3.05)	2.59 (3.16)	7.84 (3.56)	5.29 (5.99)	1.07 (1.79)	1.71 (2.40)	-
		Post test	0.74 (0.82)	1.28 (1.86)	0.61 (0.98)	4.97 (5.53)	1.16 (1.70)	7.84 (3.56)	6.14 (5.6)	1.03 (1.04)	1.14 (1.82)	0.79 (0.65)
		t value	1.0 ^{NS}	0.9 ^{NS}	0.7 ^{NS}	3.4 ^{NS}	2.2 ^{NS}	1.9 ^{NS}	1.26 ^{NS}	1.2 ^{NS}	1.2 ^{NS}	1.2 ^{NS}
9.	Social	Pre test	2.17 (2.14)	1.07 (1.79)	1.05 (0.97)	1.60 (1.13)	2.76 (3.44)	11.21 (3.61)	5.29 (5.99)	7.58 5.24	7.56 4.85	-
		Post test	0.89 (0.85)	1.15 (1.99)	1.05 (0.97)	4.72 (5.53)	1.69 (2.14)	11.49 (3.62)	6.85 (6.25)	2.21 (2.75)	7.60 5.45	1.59 0.91
		t value	1.2 ^{NS}	1.0 ^{NS}	1.0 ^{NS}	1.2 ^{NS}	1.2 ^{NS}	2.3 ^{NS}	1.47 ^{NS}	1.34 ^{NS}	1.85 ^{NS}	0.7 ^{NS}
10.	Household	Pre test	1.44 (1.49)	3.77 (2.99)	1.03 (1.04)	3.83 (2.47)	3.33 (3.30)	12.55 (4.10)	6.0 (6.12)	1.37 0.92	3.03 (3.86)	-
		Post test	1.14 (0.83)	4.79 (3.17)	1.03 (1.04)	4.02 (5.25)	2.21 (2.75)	12.58 (4.08)	7.28 (5.89)	1.39 0.91	1.86 (4.51)	1.40 0.92
		t value	0.9 ^{NS}	1.5 ^{NS}	0.9 ^{NS}	2.6 ^{NS}	1.7 ^{NS}	2.8 ^{NS}	1.84 ^{NS}	0.7 ^{NS}	1.6 ^{NS}	0.85 ^{NS}

Note: * at 5% level of significance

t value shows that in all centers the impact of intervention was not significant in all the dimensions

Each individual is unique in nature. For academically backward children care should be taken to identify proper vocations as per their ability to choose the right vocations, which will be reflected in their future occupation. There is a significant association between educational achievement and vocational interests of students. The family plays a vital role in children decisions to pursue vocational over academic areas of study. Ten areas had considered for intervention on vocational interest of academic backward children. The pre and post test were conducted for impact analysis. It

was revealed from the table 58 that 't' value shows that in all centers the impact of intervention was not significant in all the dimensions, which indicated that interest is related to the personality traits, home environment, parental support, parental aspiration etc of an individual that cannot be changed merely through providing intervention only for six month in case of academic backward children. It requires a long term strategy to establish a positive impact of the above cited areas in relation to educational achievement and vocational interest of the children.

5.2 Sensitizing mothers for management of socio-emotional behaviour of adolescents

Impact of Interventions on vocational response of youth (School dropouts)

Sl. No.	Areas		AAU, Jorhat	CCSHAU, Hisar	CSKHPKV, Palampur	MPUAT, Udaipur	MAU, Parbhani	UAS, Dharwad	PAU, Ludhiana	GBPUAT Pantnagar	ANGRU Hyderabad	TNAU Tamil Nadu
1.	Literary	Pre test	1.46	1.46	2.82	3.15	5.34	2.1	6.75	1.23	4.65	-
		Post test	1.00	3.36	2.86	3.58	5.40	2.1	2.13	2.34	2.59	1.23
		t value	0.54 ^{NS}	2.15*	0.93 ^{NS}	1.00 ^{NS}	0.87 ^{NS}	0.20 ^{NS}	2.51*	1.56 ^{NS}	0.64 ^{NS}	0.45 ^{NS}
2.	Scientific	Pre test	1.06	1.06	1.33	3.45	9.14	1.86	6.32	2.10	3.95	-
		Post test	0.63	3.67	1.51	3.95	9.93	1.90	3.65	2.92	3.95	2.46
		t value	0.58 ^{NS}	2.15*	0.85 ^{NS}	0.84 ^{NS}	0.87 ^{NS}	0.17 ^{NS}	2.54**	0.95 ^{NS}	0.64 ^{NS}	1.02 ^{NS}
3.	Executive	Pre test	2.00	2.00	0.89	1.25	6.93	2.0	9.32	1.43	1.45	-
		Post test	1.80	2.82	0.88	4.53	7.40	2.1	3.00	1.36	4.53	2.15
		t value	1.54*	0.85 ^{NS}	0.54 ^{NS}	2.08*	2.05*	0.39 ^{NS}	5.15**	0.64 ^{NS}	2.68*	1.45 ^{NS}
4.	Commercial	Pre test	1.71	1.71	2.96	2.68	9.86	1.93	6.72	1.29	2.68	-
		Post test	1.03	2.24	3.26	3.68	14.90	2.06	5.44	1.24	3.68	1.21
		t value	0.85 ^{NS}	1.57*	1.54 ^{NS}	1.51 ^{NS}	2.45**	0.84 ^{NS}	2.01*	0.93 ^{NS}	1.21 ^{NS}	0.65 ^{NS}
5.	Constructive	Pre test	1.49	1.49	2.65	3.03	11.63	1.93	4.91	2.73	3.65	-
		Post test	0.9	2.97	2.42	3.38	12.33	1.96	9.44	1.45	2.48	1.86
		t value	0.99 ^{NS}	1.53*	0.54 ^{NS}	0.62 ^{NS}	0.98 ^{NS}	0.24 ^{NS}	4.89*	1.65*	0.67 ^{NS}	0.48 ^{NS}
6.	Artistic	Pre test	1.60	1.60	0.81	2.73	11.11	2.06	8.11	1.5	1.69	-
		Post test	1.17	3.03	1.00	4.28	12.20	2.1	6.20	1.0	3.58	2.56
		t value	0.57 ^{NS}	2.54*	0.54 ^{NS}	2.05*	0.87 ^{NS}	0.60 ^{NS}	2.45**	0.25 ^{NS}	2.65*	1.82 ^{NS}
7.	Agriculture	Pre test	2.54	2.54	1.95	6.53	11.83	1.96	5.20	3.38	2.71	-
		Post test	1.29	2.82	1.86	3.23	14.90	2.03	9.53	3.53	2.58	2.45
		t value	1.06*	0.87 ^{NS}	0.87 ^{NS}	3.08*	2.01**	0.56 ^{NS}	4.24**	1.1 ^{NS}	0.87 ^{NS}	1.89 ^{NS}
8.	Persuasive	Pre test	1.69	1.69	1.19	3.38	7.84	2.03	6.95	5.70	1.57	-
		Post test	1.06	2.48	2.25	3.53	8.20	2.06	5.00	4.06	3.61	2.56
		t value	0.75 ^{NS}	1.25*	1.48*	1.1 ^{NS}	1.21*	0.29 ^{NS}	1.25 ^{NS}	1.25*	2.08**	1.82 ^{NS}
9.	Social	Pre test	2.71	2.71	1.23	5.50	11.21	2.06	6.42	4.55	3.45	-
		Post test	1.34	2.58	1.39	4.07	11.20	2.13	6.25	3.68	2.58	2.45
		t value	1.54*	0.87 ^{NS}	0.54 ^{NS}	1.25*	0.54 ^{NS}	0.85 ^{NS}	0.78 ^{NS}	0.44 ^{NS}	1.00 ^{NS}	1.23 ^{NS}
10.	Household	Pre test	1.57	1.57	1.19	7.55	12.55	1.96	7.69	2.45	2.45	-
		Post test	1.0	6.61	1.54	7.68	12.60	2.26	11.93	2.42	1.85	2.45
		t value	0.87 ^{NS}	5.08**	0.87 ^{NS}	0.54 ^{NS}	0.52 ^{NS}	2.03*	5.89**	0.64 ^{NS}	0.44 ^{NS}	1.24 ^{NS}

Note: * at 5% level of significance ** At 1% level of significance

Results related to impact of interventions is indicated that students from Assam found significant in executive, agriculture and social dimensions of vocation (Table 60). Similar results were also found out students from Hisar. Pre and post values were not significant except persuasive dimension among Palampur students. Artistic, executive, agriculture and social dimensions

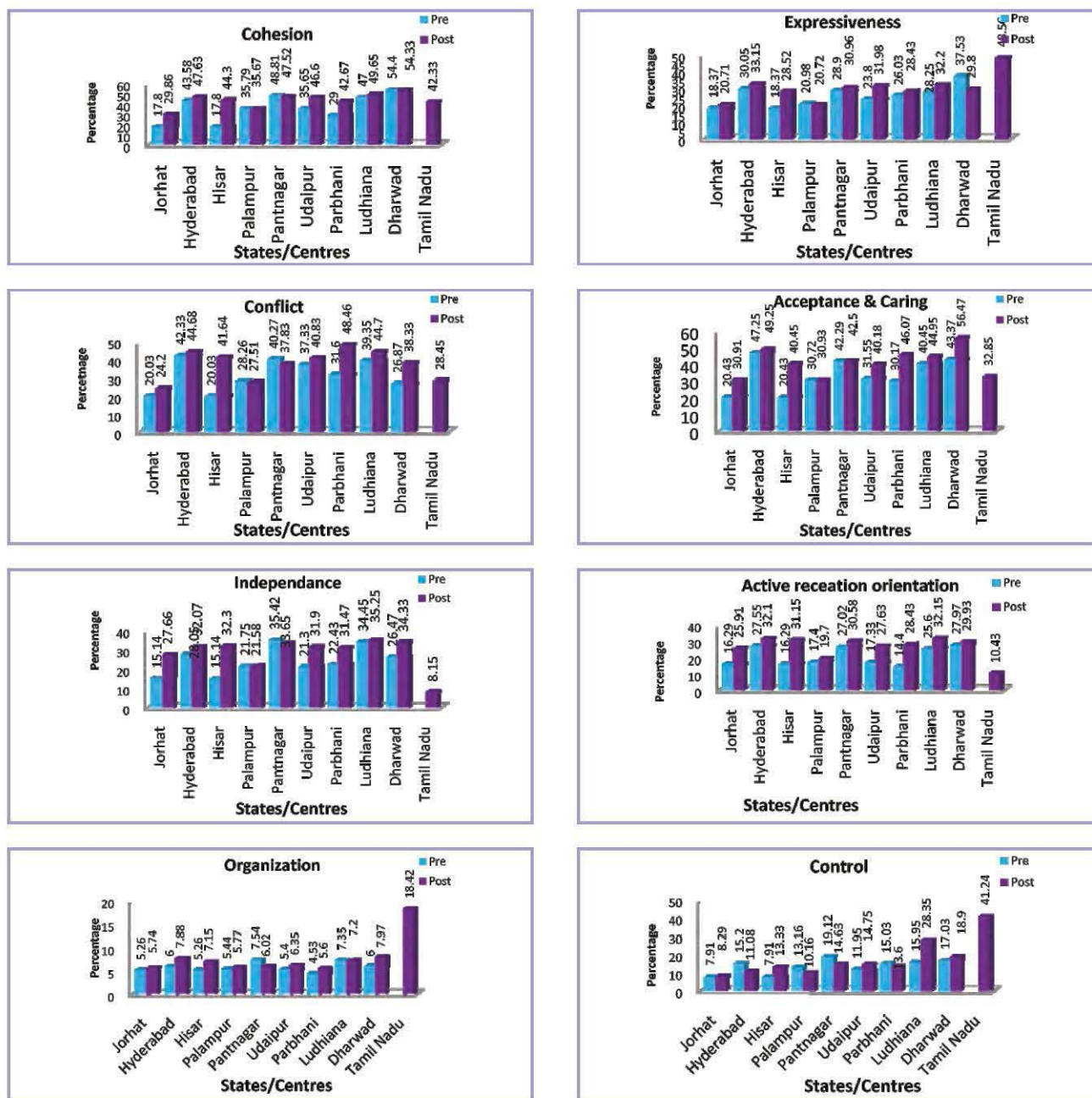
were found significant among Udaipur students. Executive, commercial, agriculture, persuasive dimensions were found significant among Parbhani students. Only household vocation was found significant among Dharwad students. All the dimensions were significant except persuasive and social among Ludhiana students.

c) Family environment of school dropouts

Family of a person plays important role in his/her socialization that has major impact on his/her (agrarian households) adjustment, attitude, values, activities and personality etc. A family environment scale containing

69 statements including three dimensions i.e., relationship, personal growth and system maintenance of family environment was administered to study the family environment of school dropouts.

Fig.55. Impact of Interventions on Family Environment perceived by youth (School dropouts)



After the intervention the impact study was conducted to know the effect of relationship, Personal growth and System maintenance dimensions with the sub areas. It was found that from figures 55 that relationship and personal growth dimensions were increased with the

subareas whereas in case of system maintenance dimensions decreased in one of the sub area i.e., Control, which means that setting limits on the movement of the family members have reduced. Statistically significant differences were also observed.

d) Coping strategies of school dropouts

Facing stress, conflict and other problems are common in every body's life. Coping mechanism of an individual determines how adverse conditions affect one's life. There are many coping strategies which a person uses at some or

the other time in everyday life. A coping Response Inventory developed by Moos (1993) containing 48 statements about different style of coping was used to find out the preferred style of school dropouts. Results of their coping responses are given in table 62.

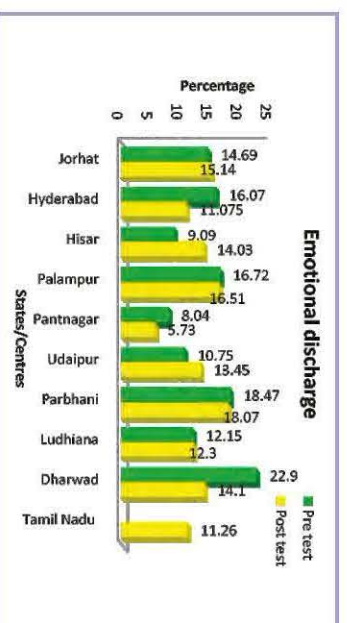
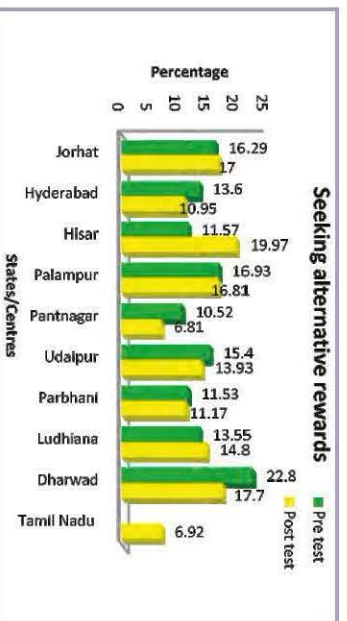
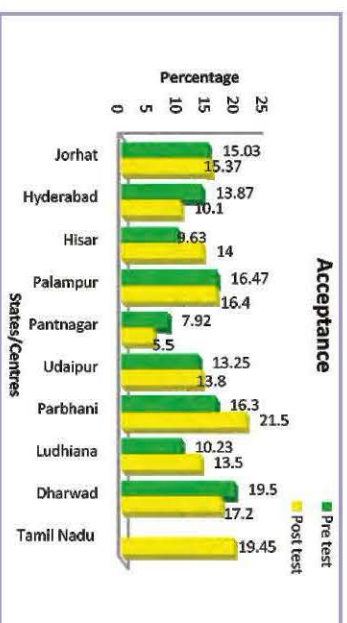
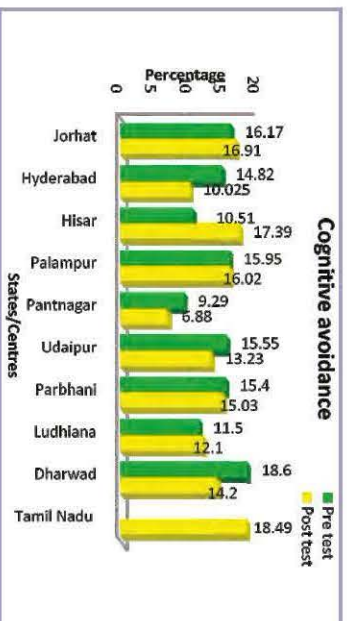
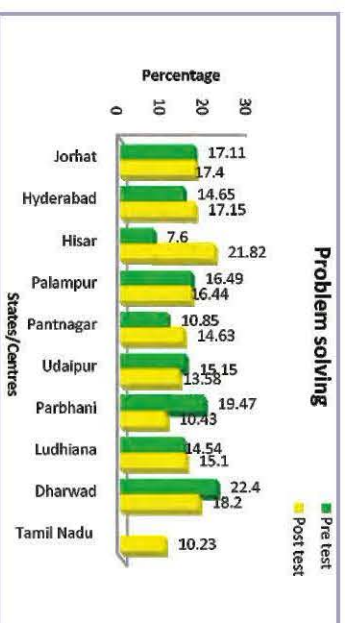
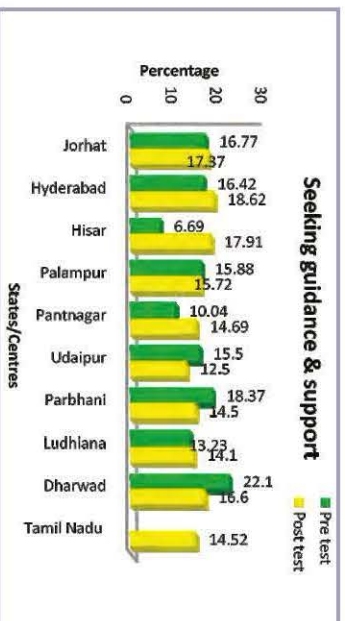
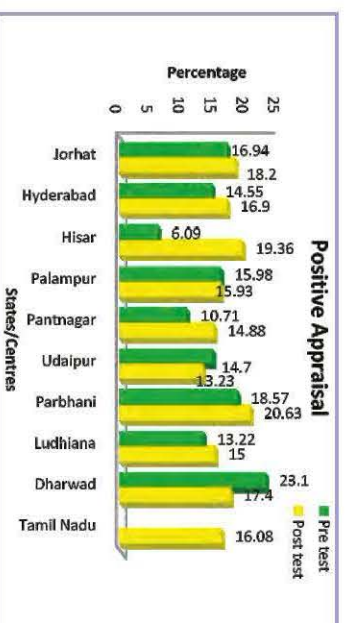
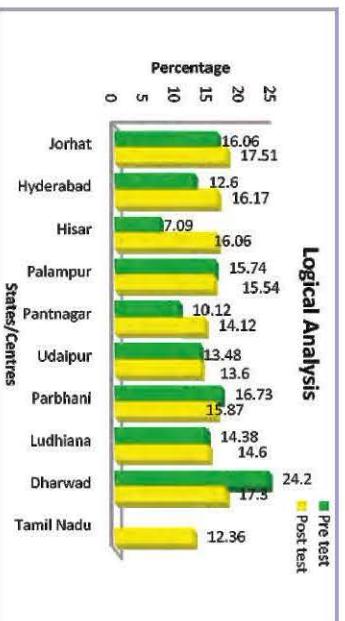
Coping strategies of school dropouts (Moos, 1993)

Sr. No.	Centre	Category	Areas							
			Approach coping of school dropouts				Avoidance coping of school dropouts			
			Logical analysis	Positive appraisal	Seek guidance & support	Problem solving	Cognitive avoidance	Acceptance	Seek alternative rewards	Emotional discharge
1.	Assam	Low	-	-	-	-	-	1 (2.86)	-	-
		Average	18 (51.42)	14 (40.0)	18 (51.42)	15 (42.86)	19 (54.29)	26 (74.29)	15 (42.86)	22 (62.86)
		High	17 (48.57)	21 (60.0)	17 (48.57)	20 (57.14)	16 (45.71)	8 (22.86)	20 (57.14)	13 (37.14)
2.	Telangana	Low	10 (25.0)	2 (5.0)	-	3 (7.5)	3 (7.5)	6 (15.0)	3 (7.5)	1 (2.5)
		Average	30 (75.0)	33 (82.5)	18 (45.0)	24 (60.0)	26 (65.0)	26 (65.0)	8 (20.0)	19 (47.5)
		High	-	5 (12.5)	22 (55.0)	13 (32.5)	11 (27.5)	8 (20.0)	8 (20.0)	20 (50.0)
3.	Haryana	Low	1 (3.0)	-	-	-	1 (3.0)	1 (3.0)	-	1 (3.0)
		Average	11 (33.3)	12 (36.3)	15 (45.5)	5 (15.2)	18 (54.5)	27 (81.8)	9 (27.3)	27 (81.8)
		High	21 (63.7)	21 (63.7)	18 (54.5)	28 (84.8)	14 (42.5)	5 (15.2)	24 (72.7)	5 (15.2)
4.	Himachal Pradesh	Low	3 (5.27)	2 (3.53)	-	-	-	2 (3.5)	-	7 (12.29)
		Average	47 (82.45)	45 (78.94)	50 (87.71)	52 (91.22)	35 (61.43)	55 (96.52)	45 (78.94)	50 (87.71)
		High	7 (12.29)	10 (17.55)	7 (12.29)	5 (8.78)	22 (38.59)	-	12 (21.05)	-
5.	Uttarakhand	Low	5 (9.0)	6 (12.0)	12 (23.0)	11 (21)	17 (33.0)	30 (58.0)	8 (15.0)	31 (60.0)
		Average	47 (90.0)	45 (87.0)	38 (73.0)	39 (75.0)	35 (67.0)	22 (42.0)	43 (83.0)	21 (40.0)
		High	-	1 (2.0)	2 (4.0)	2 (4.0)	-	-	1 (2.0)	-
6.	Rajasthan	Low	-	-	-	-	-	-	-	4 (10.0)
		Average	37 (92.5)	31 (77.5)	29 (72.5)	11 (27.5)	22 (55.0)	40 (100.0)	29 (72.5)	36 (90.0)
		High	3 (7.5)	9 (22.5)	11 (27.5)	10 (25.0)	18 (45.0)	-	11 (27.5)	-
7.	Maharashtra	Low	-	-	-	-	1 (3.3)	-	4 (13.3)	-
		Average	11 (36.7)	7 (23.3)	4 (13.3)	4 (13.3)	13 (43.3)	24 (80.0)	26 (86.7)	4 (13.3)
		High	19 (63.3)	23 (76.7)	26 (86.7)	26 (86.7)	16 (53.3)	6 (20.0)	-	26 (86.7)
8.	Karnataka	Low	-	-	-	-	-	-	-	-
		Average	28 (66.66)	24 (57.14)	34 (80.95)	27 (64.28)	34 (80.95)	28 (66.66)	21 (50)	31 (76.19)
		High	14 (33.33)	18 (42.85)	8 (19.04)	15 (35.71)	8 (19.04)	14 (33.33)	21 (50)	11 (27.5)

Figures in parenthesis indicate percentage

Table 62 depicted that majority of school dropout belonged to average category in all the centers showing that they usually follow the approach coping system. Respondents belongs to Assam (48.57, 60.0, 48.57 & 57.14%), Haryana (63.7, 63.7, 54.5 & 84.8 %), Maharashtra (63.3, 76.7, 86.7 & 86.7 %) respectively reported that they faced the adverse situation to relax

from stress according to their self approach. Results indicated need of proper interventions to enhance their approach coping style for well-being. Similar trend was observed in **avoidance coping of school dropouts**, that majority of the school dropouts belonged to average category followed by high category.



The impact study was conducted after the intervention in coping responses. The data revealed that in the approach coping system, the responses of the respondents increased in 4 sub areas like Logical analysis, Positive appraisal, Seeking guidance & support, Problem solving in all the centers except Himachal Pradesh, Rajasthan, Maharashtra and Karnataka. In the avoidance approach coping system, the responses of the respondents decreased in all the sub areas like cognitive avoidance, acceptance, seeking alternative rewards, emotional discharge in Telangana, Uttarakhand, Rajasthan and Karnataka. Statistically significant differences were also observed (Fig. 56).

e) Socio-emotional problems of school dropouts

During the year under report attempt was made to study socio-emotional problems of school dropouts using a scale prepared by AICRP-CD component (2014), MPUAT, Udaipur centre containing 70 statements.

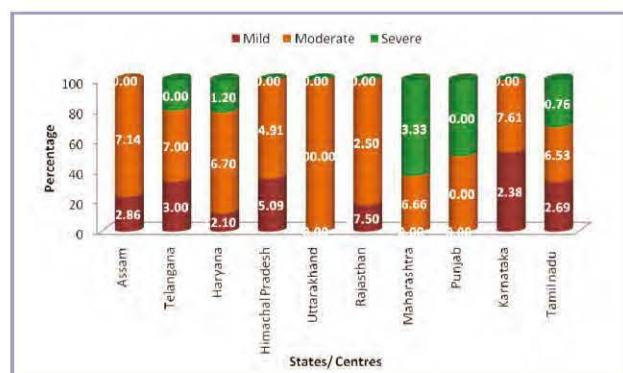


Fig.57 : Socio-emotional problems of school dropouts

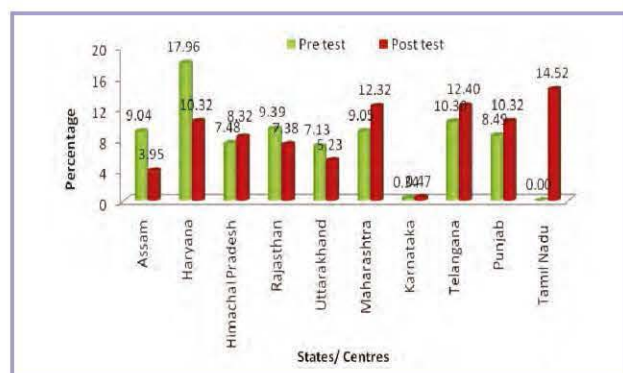


Fig.58: Impact of interventions on Socio-emotional problems of school dropouts

Fig.57 presenting result of socio - emotional problems of school dropouts. Percentage analysis depicted that Himachal Pradesh (35.09%), Telangana (33%), Assam (22.86%), Rajasthan (17.5%), Haryana (12.1%) and 52.38 per cent children from Karnataka had mild socio-emotional problems. It may be because of influence of

their families and school. It seems that efforts are needed to make them socially and emotionally equipped. While more than half (63.33%) of children from Maharashtra and 50 per cent children from Punjab center reported that they had severe emotional problems which needs interventions. Their problem may be mainly because of the family environment and child rearing practices. Their parents have little information about socio-emotional state of their son/daughter to guide them properly. Interventions on parenting are an ominous need of the hour.

Result presented in the fig. 58 shows that mean socio-emotional problems decreased and impact of interventions was statistically significant in all the centers except Karnataka.

6. Livelihood Security of Farm Families

Family and Group Entrepreneurship Development with Market Linkage in the Selected Production Systems

A person's livelihood refers to their "means of securing the necessities of life". Livelihood is defined as a set of economic activities, involving self-employment, and or wage employment by using one's endowments (both human and material) to generate adequate resources for meeting the requirements of the self and household on a sustainable basis with dignity. Rural livelihood include agricultural work and other allied works. In recent years land based livelihood of small and marginal farmers is increasingly becoming unsustainable, since land is not been able to support the family's food requirements and fodder for their cattle. As a result, rural households are forced to look at alternative means for supplementing livelihoods.

By considering the changing faces of rural livelihoods in India the AICRP on Home Science facilitates out the following family and group enterprises with market linkage for sustainability.

Value added products

Three protein rich recipes viz., mix pulse shev, proteinmix powder, peas stick, millet & moringa powder based value added products were developed and transferred to rural entrepreneurs. A product named, Adai mix was produced in bulk and marketed. Technology for moringa powder based value added products was transferred to 3 SHG members and the product is being upscaled for commercialization by Ms. A. Seethalakshmi, of Thanichiyam village, Madurai



Counseling centre

One of the mandates of Human Development & Family Studies component - AICRP on Home Science is to establish a Youth Counseling centre at the village level. Keeping this in mind, a Counseling centre was

established at Hatichungi Komar Gaon, AAU, Jorahat on 18th February, 2016. The centre was set up in the existing Anganwadi centre. Regular counseling is being provided on every Tuesday and Wednesday from 11a.m onwards. Rural adolescent girls, boys as well as married women visit the centre.

Linkages developed

For smooth functioning of the project and also for dissemination of the technology at grass root level, care has been taken to establish linkages with various Government, Non-government and other developmental agencies like, ICAR institutes/ SAUs, Krishi Vigyan Kendras, ICDS, CARE, DRDA, NABARD, **ATMA, State Departments, Dept of Women Development & Child Welfare, Panchayats, Farmer's Welfare Society, Mahila Mandals, Nehru Yuva Kendra, local banks, All India Radio, Doordarshan, NIMSMetc.**

Educational material developed

Thirteen bilingual Leaflets/Folders/ Pamphlets/ Booklets were developed for the benefit of the farming community illustrating the developed technologies of AICRP on Home Science.

INSTITUTE TECHNOLOGY MANAGEMENT UNIT (ITMU) HUMAN RESOURCE DEVELOPMENT (HRD):

Based on the national training policy 2012 of the department of personnel and training, Govt. of India, ICAR has prepared the integrated training policy of ICAR,

2014, which envisages periodical training exposure of all the employees of the ICAR institutes.

Physical Targets and Achievements of Annual Training Plan , 2016-17:

Sl. No.	Category	Total No. of Employees	No. of trainings planned	No. of employees undergone training	% realization of trainings planned during 2016-17
1	Scientist	16	10	9	90.00
2	Technical	12	8	5	62.50
3	Administrative & Finance	6	3	2	66.67
4	SSS	1	NIL	NIL	NIL
Total		35	21	16	76.19

Financial targets and achievements (All employees in Lakhs), 2016-17:

Sl. No.	RE for HRD			Actual Expenditure for HRD			% Utilization of RE for 2016-17
	Plan	Non-plan	Total	Plan	Non-plan	Total	
1	1.50	0	1.50	1.43	0	1.43	95.33

MAJOR INITIATIVES OF THE INSTITUTE

(i) Mera Gaon Mera Gaurav

Four multi disciplinary Scientist's teams were constituted under ICAR-CIWA, Bhubaneswar for Mera Gaon Mera Gaurav program and 20 villages were adopted covering five blocks in two districts (Cuttack and Puri) of Odisha. With the help of key communicators, rapport building was done and new agricultural techniques were disseminated to the farm women like production of oyster mushroom, cultivation of banana, lime, drumstick, papaya, palak and amaranthus in the homestead garden, nursery raising, rearing backyard poultry, pest and disease management in horticultural crops. Farm women were trained for preparation of Jute craft and for nutritional improvement of children, Chhatua (weaning mix) preparation was initiated. Women were exposed to drudgery reducing small garden tools and implements provided by the institute. For partnering women in the institutional programmes different important days like Women in Agriculture Day, World Soil Day, Jai Kishan Jai Vigyan and Agriculture Education Day were celebrated in villages followed by quiz and debate competition among farm women. Awareness was also created among villagers about National Programs.





Fig. Glimpses of MGMG activities

Institute Summary for the activities of under MGMG program

S. No.	Name of the Team	No. of Scientists Involved	No. of villages covered	No. of field activities conducted	No. of messages/ advisory sent	Farmers benefited (No.)
1	01	4	5	40	Nil	3161
2	02	4	5	85	8	3644
3	03	4	5	55	6	1854
4	04	4	5	58	Nil	3660
Total		16	20	238	14	12259

(ii) Swachh Bharat Abhiyan

All the staff members of the institute are participating in the weekly mass cleanliness drives for about two hours on every working Saturday. The 'Swachh Bharat Mission' has been integrated with other programmes of the institute such as field days, technology demonstrations, on and off-farm training programmes in its area of operation. The institute, through its eleven centres of AICRP on Home Science, conducts awareness campaigns through rallies and mass cleanliness in its adopted villages involving farm women, farmers, school children and rural youth.

As part of the ongoing 'National Sanitation Campaign', 'Swachhta Pakhwada 2016' celebration was

observed during 16-31 October, 2016 at ICAR-CIWA, Bhubaneswar. The Swachhta Pledge, an elocution and a poster competition on the theme "Swachh Bharat-Swasth Bharat" were also conducted. Mass cleanliness drives campaigns and human chains, a demonstration on composting were also organized. Off campus activities in form of awareness programme were conducted in village Jhadeswarpur, Haridamada, Khandagar etc.

The Institute had the proud privilege of the participation of Shri. Chhabilendra Roul, Additional Secretary (DARE) and Secretary (ICAR) in the Swachhta Pakhwada activities on 24 October, 2016.



Participation of Shri. Chhabilendra Roul in the Swachhta Pakhwada (24-10-2016)

EVENTS ORGANIZED BY ICAR-CIWA

(i) International yoga day:

ICAR-Central Institute for Women in Agriculture observed the 2nd International Yoga Day on 21st June, 2016 in the campus. The important health benefits of

specific Asanas & Pranayams, need of practising yoga everyday to maintaining calm, stress free and efficient life was emphasised. The staff of the institute practised a number of Asanas & Pranayams from 7:00 am to 8:00 am.



Fig. Glimpses of International yoga day

(ii) Hindi Pakwada



(iii) National Workshop on Mitigating Drudgery of Farm Women: Adoption of Gender Friendly Technologies

A two days National Level Workshop was conducted on "Mitigating Drudgery of Farm Women: Adoption of Gender Friendly Technologies" during 15-16 September, 2016 at ICAR-Central Institute for Women in Agriculture, Bhubaneswar. The workshop comprised of representatives from different fields working towards lessening the drudgery of farm women in India. It was a very enriching event for bringing together and sharing of experiences of different stakeholders in order to understand the issue on the ground and also the strategies to manage it. More than 50 experts, participants, scientists from different parts of India participated in the workshop. Director, ICAR-CIWA, Dr. Jatinder Kishtwaria, Mrs. Sujata R. Karthikeyan, Commissioner cum Director, Watershed Mission,

Director of Soil Conservation, Watershed Development, Govt. of Odisha and Prof. Surendranath Pasupalak, Vice Chancellor, OUAT, Bhubaneswar were among the dignitaries. Eminent scientists and experts from NABARD, NGOs, Women Leaders, IMC Members & Scientists of ICAR-CIWA contributed immensely in putting forth their ideas regarding designing and development of women friendly agricultural tools. They threw light on the intensity of the problem and the extension gap regarding drudgery reduction of farm women. In this workshop the topics covered were improving productivity of farm mechanisation; women friendly farm tools and equipment for drudgery reduction; design, development, refinement and evaluation of women friendly technology and extension strategies to address drudgery of farm women etc. Great synergy was created when all these persons came together to discuss and churn out models for drudgery reduction of farm women.



(iv) Workshop on Gender Responsive Budgeting

Two days National Level Sensitization Workshop was conducted on "Gender Responsive Budgeting" during 5-6 October, 2016 at ICAR-Central Institute for Women in Agriculture, Bhubaneswar in collaboration with Nodal Centre for Women Development & Gender Studies, NIFM, Haryana. It was a capacity building programme for creating awareness among scientists and staffs of ICAR-CIWA for understanding the gender equality concepts and public financial management through gender responsive budgeting. About 50 participants had participated in the program. Gender Budgeting is for



achieving gender mainstreaming. Dr. Shikha Mathur, Dr. Reetu Sharma, Dr. Diksha, Dr. Sudeshna Sen from NIFM, Haryana contributed immensely in putting forth their ideas regarding gender budgeting, need assessment, budget making process and identifying gender issues using GB checklist etc. Adequate interactions and discussions among the participants of the workshop helped in bringing clarity on the subject which will act as a platform for scientists and staff of ICAR-CIWA for further dissemination of the knowledge to other related stake holders. The programme was organised by Dr. Sabita Mishra and her team.



(v) World food day

ICAR-CIWA observed the World Food Day on October 16, 2016. The theme of the day was 'Climate is Changing: Food and Agriculture must too'. The ICAR-CIWA together with other ICAR Institutions participated in a programme organized by Orissa Krushak Samaj in Bhubaneswar. Many Agricultural R&D stakeholders including men and women farmers, participated in the Programme. Among the notable personalities who attended the programme were Dr. A. K. Singh, DDG (Agril. Extn), ICAR, Dr. J. K. Jena DDG (Fisheries Science), Dr. Jatinder Kishtwaria, Director, ICAR-CIWA Bhubaneswar, Dr. H. Pathak, Director, ICAR-NRRI Cuttack, Dr. Khageswar Pradhan, former Vice Chancellor, OUAT, Dr. P. C. Mohanthy, Chairman, Orissa Krushak Samaj, Mr. Guru Prasad



Mohanthy and Scientists of ICAR Institutions. Dr. Jatinder Kishtwaria, Director, ICAR-CIWA in her address highlighted the need to create awareness among women farmers about consequences of Climate Change and make them empowered to adopt new scientific practices to mitigate the adverse impact of Climate Change. On the Occasion, Dr. Jatinder Kishtwaria Director, ICAR-CIWA was conferred 'Krusha Ratna Award-2016' by Orissa Krushak Samaj for her significant contribution to Research on women in agriculture and her consistent efforts to foster women empowerment with new Knowledge and Technology. ICAR-CIWA also put up a stall displaying some of the important achievements of the Institute that are useful for Women Farmers. Dignitaries and farmers who attended the programme also visited the ICAR-CIWA Stall.



(vi) ICAR-CIWA Vigilance Awareness Week

As per the decision of Central Vigilance Commission and directives of Indian Council of Agricultural Research, New Delhi, ICAR-CIWA Bhubaneswar observed Vigilance Awareness Week- 2016 from 31st October to 5th November 2016 on the theme "Public participation in promoting Integrity and eradicating Corruption". Dr.(Mrs.) Jatinder Kishtwaria, Director, ICAR-CIWA administered the pledge to all the staff members and



explained the importance of the event. Further, a talk on Sensitization programs on policies/procedure of organization was delivered by Sh. Jairam Biswal, Administrative Officer, ICAR-CIWA. Dr. S. K. Srivastava, Vigilance Officer, ICAR-CIWA also gave a Sensitization presentation about the 'Vigilance' on that day. Handouts on "preventive vigilance activities/whistle blower mechanism and other anti-corruption measures" have also been distributed among the staffs.



(vii) Training-cum-Workshop on "Trends in Gender Research"

Two Training-cum-Workshops on "Trends in Gender Research" for scientists of ICAR-CIWA, Bhubaneswar and AICRP on Home Science were organised at ICAR-CIWA. The 1st workshop for foods and nutrition component was conducted during 15th-16th November, 2016. With two eminent experts Dr. Vinita Sharma, DST----- Dr. Mushtari Begum (Retd. Prof., Food & Nutrition, UAS, Bengaluru), the second workshop dealing with four components of AICRP on Home Science like HDF5, CT, HSEE, FRM was organised during 26-27 November, 2016 under the chairmanship of Dr Jatinder Kishtwaria, Director, ICAR-CIWA. Twelve scientists from AICRP on Home Science and 17 scientists of ICAR-CIWA attended the above workshop. Dr. Vinita Sharma, Dr. V.V. Sadamate (Ex-Adviser, Agriculture, Planning

commission), Dr. K. Mayuri (Emeritus Scientist, PJTSAU, Hyderabad), Dr. Sharada Devi (Emeritus Scientist, PJTSAU, Hyderabad), Dr. B. N. Sadangi (Head, Social Science, ICAR-NRRI), Dr. Aloknath Roy (Head, ICAR-NIRJAFT), Dr. S. P. Singh (PS, FMP, ICAR-IARI), Dr. S. K. Mohanty (Assoc. Prof., FMP, OUAT) were the experts and gave valuable inputs for finalizing the new project proposals. During the workshop technical co-ordinators of AICRP for all the four components finalised their proposed projects with contribution from the experts. Dr. Shivaji D. Argade, Scientist and Dr A. Sarkar, Sr. Scientist, ICAR-CIWA appraised the participants about gender equity and women empowerment in Agril. Index. Director, ICAR-CIWA insisted on proper coordination and cooperation among the scientists of AICRP and ICAR-CIWA. The workshop was ended with valuable remarks by the experts.



(viii) Women in Agriculture Day:

ICAR-CIWA celebrated the women in agriculture day in 20 adopted villages on 4th December, 2016. On this occasion, deliberations on role of women in agriculture and allied activities were made. At village Balarampur in Athagarh Block of Cuttack district, the programme was organized by the MGMG team comprising Dr. Naresh Babu, Principal Scientist (Horticulture), Dr. Biswanath Sahoo, Principal Scientist (Animal Nutrition), Dr. J. Charles Jeeva, Senior Scientist (Ag. Extension), Ms. Gayatri Moharana, Scientist (FRM) and Shri. Sanjay Kumar Behera, Technical Assistant. In Kadua Village, Satyabadi block, Puri district the programme was attended by 70 farm women and the programme was organized by Dr S.K.Srivastava, Dr Jyoti Nayak, Dr Tanuja.S, Dr Shivaji. D Argade, Mr Atul Chetan Hemrom and Mrs Geeta Saha. At Khandagar Village in Barang Block of Cuttack district, 100 farmers participated in the programme which was organized by the ICAR-CIWA team of Dr. Anil Kumar, Dr L.P.Sahoo, Dr Ananta Sarkar and Dr. Sujit Kumar Nayak. In all the villages awareness was also created among the school children, rural youth and farming communities about the importance of "Agricultural Education Day" and "World Soil Day 2016: 'Soils and pulses, a symbiosis for life'. Quiz competitions, scientist farmer interfaces, expert talks etc were also organized in the above said villages.

(ix) Jai Kisan Jai Vigyan

ICAR-CIWA, Bhubaneswar celebrated 'Jai Kisan Jai Vigyan' programme from 23 - 25 December, 2016 to commemorate birth anniversary of two former Prime Ministers Shri Atal Bihari Vajpayee and Late Shri Chaudhary Charan Singh. As a part of the celebration, one outreach programme for 50 farm women was organized on 23 December, 2016 at ICAR-CIWA campus. Dr. Jatinder Kishtwaria, Director, ICAR-CIWA, Bhubaneswar highlighted the necessity for celebrating 'Jai Kisan Jai Vigyan' days and role of ICAR-CIWA in addressing gender issues in agriculture and allied fields. Dr. H. K. Dash, Principal Scientist, deliberated on gender mainstreaming and women empowerment and emphasized the importance of linkage between farmers and scientists for effective transfer of technologies. A training cum demonstration on Oyster Mushroom Cultivation was imparted to the farm women during the occasion by the outreach Team led by Dr. Sabita Mishra.



(x) XXII Biennial Workshop of All India Coordinated Research Project on Home Science

The XXII Biennial Workshop of All India Coordinated Research Project on Home Science was hosted by the College of Home Science, Assam Agricultural University,

Jorhat Assam from 10th and 11th February, 2017. This workshop was inaugurated by the Chief Guest Hon'ble Deputy Director General (Agricultural Education), Dr. Narendra Singh Rathore. The Hon'ble Vice Chancellor, Dr. K. M. Bujarbaruah chaired the inaugural session and Ms. Zerifa Wahid, Ambassador, Assam Autism Foundation & Special Olympics Bharat (Assam Chapter) was the Guest of Honour for this programme.

The Director of Research, AAU, Jorhat, Dr. G. N. Hazarika delivered welcome address and highlighted the achievements of AAU, Jorhat. The Director, ICAR-Central Institute for Women in Agriculture cum Programme Coordinator of AICRP on Home Science highlighted the major achievements of the ongoing

projects, the future thrust areas and proposed projects for the medium plan under five components of AICRP on Home Science.

Dr. N. S. Rathore, Honourable DDG, Agricultural Education, stressed upon need based research to bridge the gap between present technological demand and supply to empower the rural women.

Dr. K. M. Bujarbaruah, Hon'ble Vice Chancellor emphasized on establishing linkages with different national programmes, local functionaries and farming communities for greater impact of AICRP on Home Science. Dr. Ruplekha Borah, Professor and Head was the organising secretary of this XXII Biennial Workshop.



(xi) National Productivity Week'

ICAR-Central Institute for Women in Agriculture celebrated "National Productivity Week" during 12-18 February, 2017. The theme was 'From Waste to Profits through Reduce, Recycle, Reuse'. Dr. Jatinder Kishtwaria, Director, ICAR-CIWA stressed on improving farm productivity by woman through optimum utilization of available farm resources. The programme was attended by all the scientific, technical and administrative staff members of ICAR-CIWA.

To mark the occasion, the mass awareness and cleaning campaign was organised on the farm of ICAR-CIWA by

collecting all farm waste for recycling it through composting. Further, the community radio programme of ICAR-CIWA on "*Unnati pathare mahila*" was broadcasted through seven channels throughout the State. A poster competition was organised for the staff of ICAR-CIWA. One scientific talk was delivered by Dr. Gagnesh Sharma, Regional Director, Regional Centre of Organic Farming, Bhubaneswar on topic entitled "Agricultural Waste to Profits through Reduce, Recycle, Reuse" during the week. The winners of the poster competition were awarded. The programme was organised by Dr. Biswanath Sahoo and team.



(xii) Foundation Day of ICAR-CIWA:

ICAR- Central Institute for Women in Agriculture (ICAR-CIWA), Bhubaneswar celebrated its 20th Foundation Day on 17 February, 2017. On this occasion, Hon'ble Secretary (DARE) & Director General (ICAR) Dr. Trilochan Mohapatra, New Delhi was the Chief Guest. Dr. N. S. Rathore, Deputy Director General (Agriculture Education), Dr. A. K. Singh, Deputy Director General (Agriculture Extension), Dr. S. Pasupalak, Vice-Chancellor (OUAT, Bhubaneswar), Dr. T. Janakiram, Assistant Director General (Horticulture), Dr. V. V. Sadamate, Former Member of Planning Commission and Dr. Asha Hans, Gender Expert were the Guests of Honour. Directors and In-charge of local ICAR institutes and regional stations also graced the occasion. The programme was attended by more than 300 farm women from 25 adopted villages of ICAR-CIWA and more than 100 delegates from different ICAR institutes, state departments and media personnel. Dr. Trilochan Mohapatra, Chief Guest accompanied by the Guests of Honour lighted the lamp and inaugurated the function. Dr. Jatinder Kishwaria, Director, ICAR-CIWA delivered welcome address, briefed about the achievements of the Institute over two decades and highlighted the potential of the Institute first of its kind in India that is exclusively devoted to gender related research for women in agriculture. Dr. Asha Hans highlighted that

the unpaid work of farm women should be recognised. Dr. V. V. Sadamate stressed upon the extension strategies for gender mainstreaming. Dr. T. Janakiram highlighted the importance of horticulture from nutritional point of view for the farm women. Dr. S. Pasupalak mentioned that women are only the present and future of Indian agriculture. Dr. A. K. Singh stressed upon the women empowerment and nutritional security of farm women for wealthy and healthy India. Dr. N. S. Rathore highlighted the importance of women in all social, economical and agricultural spheres. He also delivered Foundation Day lecture on "Engendering Agricultural Research and Education". Dr. Trilochan Mohapatra, Chief Guest started with congratulating the Institute for celebrating its Foundation Day and wished for the bright future of the Institute. He also suggested that the research and technology development should be women centred and it should reach to the grassroot level. The logo of ICAR-CIWA was launched by the Chief Guest. The newly designed website of ICAR-CIWA was launched by Dr. N. S. Rathore. The ICAR-CIWA publications were released by the dignitaries. Twenty innovative farm women were awarded with small farm tools and equipments on the occasion. All the scientists and staff of ICAR-CIWA under the leadership of Dr. Jatinder Kishwaria & Dr. Sabita Mishra, contributed immensely for celebration of 20th foundation day of the institute.



(xiii) National Science Day

ICAR-Central Institute for Women in Agriculture, Bhubaneswar celebrated "The National Science Day" on 28th February, 2017. Dr. Jatinder Kistwaria, Director ICAR-CIWA, emphasized on the Importance of science used in the daily life of the people and how science has made life easier for us. Smt. Reeta Jena, delivered the science day lecture on the theme "Science and Technology for The Specially Abled Persons. She



stressed on 'barrier free structures' to enable the specially abled persons to access different amenities and facilities in everyday life. She also highlighted few success stories of the specially abled persons who excelled in life and which inspired others to strive towards excellence. The occasion motivated all for rendering quality service to specially abled persons. The program was organized by Dr. Arun Kumar Panda and his team.



(xiv) International Women's Day

ICAR- Central Institute for Women in Agriculture, Bhubaneswar celebrated International Women's Day on 8th March, 2017. The occasion was graced by Ms. Namrata Chadha, renowned social activist and former member State Commission for Women, Odisha, Smt. Sujata Barik, IMC member, Smt. Pratima Mishra, IMC member, Dr. Meena Senapati, and Mrs. Supreety Mishra, Women Entrepreneurs. The programme was attended by farm women, Staff of ICAR- CIWA and media personnel.

Smt. Sujata Barik shared her views on the occasion about the requirement of positive change in the mindset of farming community for betterment of farm women. Smt. Pratima Mishra encouraged the institute and farm women to continue working for the cause of woman. Mrs. Supreety Mishra stressed to follow ones dream in spite of the hindrances of life and thus proved to be a source of inspiration for all the farm women. Dr. Meena Senapati, shared her experience of becoming a entrepreneur inspite of the hardships, in developing a banana tissue culture lab, mushroom farm and vermicompost units.

Ms. Namrata Chadha congratulated the institute for celebrating International Women's day and wished for a

bright future. She emphasized on the importance of the rights of the women. She explained the underlying meaning of the theme "be bold for change" emphasising that if a positive change in the condition of women has to happen, then women should be bold enough to put forth their ideas and views to embrace the opportunities of the life.

Dr. Jatinder Kishtwaria, Director ICAR-CIWA, delivered the presidential talk, summarizing the journey of women through the history, their oppression, uprising and ultimately their fight for equality. She emphasised on the role of women to take up on themselves for transforming their condition instead of depending on an outside factor. She briefed the work done by ICAR-CIWA for drudgery reduction and livelihood enhancement of farm women. An informative question and answers session was conducted between the farm women and the expert guests.

Launching of knowledge services through mobile voice messages and Sampad news paper for women farmers by Reliance Foundation was done by the Director, ICAR-CIWA. The elocution competition winners of the theme "Be bold for change" were awarded on the occasion.

The International Women's Day was organized by Dr. Tanuja Somrajan and her team.



REVIEW MEETINGS

17th Meeting of the Research Advisory Committee (RAC):

The 17th Meeting of the Research Advisory Committee (RAC) of ICAR-CIWA was held during May 11-12, 2016 at the Institute. Dr. Vinita Sharma, Chairperson of RAC, Dr. Prema Ramachandran, Dr. V.V.Sadamate, Dr. R. Rengalakshmi, Dr. Pitam Chandra, Dr. P.S.Pandey, Smt. Pratima Mishra, Smt. Sujata Barick and Dr. Jatinder Kishtwaria, all members of RAC, Dr. H.K.Dash, Member-Secretary and Scientists of ICAR-CIWA attended the meeting. Member-Secretary presented the Action Taken Report (ATR) on the recommendations of 16th RAC, and this was followed by discussion. Dr. Jatinder Kishtwaria, Director, ICAR-CIWA presented the research achievements under various projects of the Institute and future programmes. At the end, the committee suggested recommendations to strengthen the research activities of the Institute.

Quinquennial Review Team Meeting held on 25-26 March 2017:

A meeting of the Quinquennial Review Team (QRT) was held on 25-26 March 2017 to review the achievements of

ICAR-CIWA and AICRP on Home Science. The QRT meeting was chaired by Dr. P Das, Chairperson QRT and Ex-DDG (Ag. Ext.) and attended by members: Dr. Mehtab S. Bamji, Director Grade Scientist, National Institute of Nutrition, Hyderabad, Dr. Vinita Sharma, Ex-Head, SEED Division, DST, New Delhi, Dr. Ratna Tewari, Professor & Head, Department of Extension Education, SNDT Women's University and Dr. V P Chahal, Member Secretary and Assistant Director General (Ag. Ext.), ICAR, New Delhi. The Director ICAR -CIWA Dr. Jatinder Kishtwaria, Scientists of the Institute and Technical Co-ordinators of AICRP (Home Science) also attended the meeting. A detailed presentation on the achievements of the Institute was made by the Director, ICAR-CIWA followed by presentations on individual components of Home Science by the Technical Co-ordinators. The Committee discussed in detail the achievements of the Institute and also reviewed the progress of work made by AICRP centres during XII Plan period. The QRT members also reviewed the projects proposed to be taken up during 2017-2020 and made valuable suggestions. The meeting ended with thanks to the chair and members of QRT and all associated with the meeting.



राजभाषा कार्यान्वयन

OFFICIAL LANGUAGE IMPLEMENTATION 2016-17

राजभाषा कार्यान्वयन संबंधी निर्देश अनुपालन पूर्णतया सुनिश्चित करने हेतु प्रयासों को बढ़ाया गया है। राजभाषा नियमों के अनुसार प्रत्येक तिमाही में राजभाषा कार्यान्वयन समिति की बैठकें एवं हिंदी कार्यशाला नियमित रूप से आयोजित की गई।

हिन्दी पखवाड़ा

हिन्दी पखवाड़ा (१२-२६ सितम्बर २०१६) का शुभारम्भ दिनांक १२.९.२०१६ (सोमवार) पूर्वाह्न ११.३० बजे समिति कक्ष में डा (श्रीमती) जतिन्द्र किशतवाडिया, निर्देशक महोदया के अध्यक्षता में आयोजित किया गया। इस में कुल अधिकारी/कर्मचारियों को मिलाकर ३९ (उनतालीस) लोगों ने भाग लिया। इस अवसर पर अपने वक्तव्य में अध्यक्ष महोदया ने राजभाषा के महत्व व राजभाषा कार्यान्वयन हेतु संवैधानिक जिम्मेदारी से सभी को अवगत कराया एवं हमें किसी भी नए कार्य को करने कि लिए अपने मानसिकता को बदल कर कोशिश करने की आवश्यकता पर जोर दिए। इस अवसर पर कर्मचारियों द्वारा राजभाषा हिन्दी पर अपने-अपने कविता प्रस्तुत की गयी।



दिनांक १४.९.२०१६ संस्थान में हिन्दी दिवस मनाया गया। पूर्वाह्न ११.०० बजे समिति कक्ष में हिन्दी दिवस बैठक के आयोजन में निर्देशक महोदया ने राजभाषा विभाग द्वारा जारी माननीय गृह मंत्री जी का सदेश को पढ़कर सुनाये और राजभाषा को अपने शासकीय कार्य में सरलता पूर्वक कैसे अपनाया जा

सकता है इस विषय पर चर्चा किये। इस में अधिकारी/कर्मचारियों को मिलाकर कुल ३६ (छत्तीस) लोगों ने भाग लिया।

इस अवसर पर विभिन्न प्रतियोगिताएं आयोजित किये गए। इस श्रृंखला में पहला लघुकथा प्रतियोगिता दिनांक १५.०९.२०१६ अपराह्न ०३.३० बजे आयोजित किया गया। इसमें कुल १० (दस) प्रतिभागियों ने भाग लिए।

दिनांक १६.०९.२०१६ पूर्वाह्न ११.३० बजे यूनिकोड में कंप्यूटर पर हिन्दी में टंकण / टाइप राइटिंग प्रतियोगिता का आयोजन किया गया, जिससे ११ (ग्यारह) प्रतिभागियों ने भाग लिए।

सभी के पसंदीदा प्रतियोगिता हिन्दी वर्ग पहली दिनांक १७.०९.२०१६ पूर्वाह्न ११.०० बजे आयोजित कि गयी। इसमें हमेशा की तरह सभी ने बढचढकर भाग लिए। कुल २५ (पच्चीस) प्रतिभागियों ने इस प्रतियोगिता में भाग लिए।

भाषा विषय एवं लेखन का परिचय देनेवाला निबंध प्रतियोगिता दिनांक २०.०९.२०१६ अपराह्न ०३.३० बजे आयोजित की गयी। इसमें कुल ७ (सात) प्रतिभागियों ने भाग लिए। निबंध का विषय “भारत की मौजूदा विदेश नीति” रखा गया था।



दिनांक २१.०९.२०१६ अपराह्न ३.०० बजे राजभाषा तिमाही कार्यशाला का आयोजन किया गया। तिमाही राजभाषा कार्यशालाओं का मुख्य उद्देश्य कर्मचारियों में हिन्दी काम करने की शिक्षक दूर करना होता है। कार्यशाला का विषय राजभाषा कार्यान्वयन एवं महत्वपूर्ण बिन्दु, था। इस में ३० लोगों ने भाग लेकर लाभ उठाए। राजभाषा नीति, विनिर्देश, अधिनियम एवं कार्यान्वयन संबंधी सभी विषयों पर चर्चा की गयी और सदेह

निवारण किया गया। इस कार्यशाला की अध्यक्षता डा संतोष कुमार श्रीवास्तव, प्रभारी-निर्देशांक द्वारा किया गया।

दिनांक २२.०९.२०१६ अपराह्न ०३.३० बजे राजभाषा प्रश्नोत्तरी प्रतियोगिता का आयोजन किया गया जिसमें गत दिवस के कार्यशाला में चर्चा की गयी विषयों पर पूछे गए प्रश्नों को सभी प्रतिभागियों ने टीमों में भटकर उत्तर दिए। कुल २१ (इक्कीस) प्रतिभागी (सात) टीमों में भटकर भाग लिए।

अगले दिन २३.०९.२०१६ अपराह्न ०३.३० बजे “युवा पीढ़ी की कार्य नैतिकता” विषय पर वाद विवाद प्रतियोगिता का आयोजन किया गया। यह कार्यक्रम निर्देशक महोदय के अध्यक्षता में हुआ। इस में कुल ३८ (अड़तीस) श्रोताओं के उपस्थिति में १० (दस) प्रतिभागियों ने अपने विचार व्यक्त किए। निर्णायक मंडली में डा (श्रीमती) सबिता मिश्रा महोदय एवं डा आर के एस बैस महोदय रहे।

दिनांक २४.०९.२०१६ संस्थान परिसर में स्वच्छ भारत अभियान पर हिन्दी में पोस्टर प्रदर्शनी का आयोजन किया गया, जिसमें कई सुन्दर एवं सन्देशपूर्ण प्रस्तुतियां पेश की गयीं।

आर्थिक स्वावलंबन में वैज्ञानिक एवं तकनीकी संस्थानों की भूमिका पर आयोजित संगोष्ठी

भारत के चातुर्दिक विकास में विज्ञान एवं प्रौद्योगिकी का महत्वपूर्ण योगदान रहा है। आज के वैश्विक परिदृश्य तथा भारत सरकार की नीतियों को देखते हुए भौतिकी संस्थान, भुवनेश्वर के नेतृत्व में आर्थिक स्वावलंबन में वैज्ञानिक एवं तकनीकी संस्थानों की भूमिका पर २७ फरवरी, २०१७ को संयुक्त राजभाषा वैज्ञानिक संगोष्ठी आयोजित की गई। इस वैज्ञानिक संगोष्ठी में भौतिकी संस्थान, सीएसआइआर-खनिज एवं पदार्थ प्रौद्योगिकी संस्थान, जीव विज्ञान संस्थान, नाइजर, एम्स, केन्द्रीय कृषिरत महिला संस्थान, मधुर जल मत्स्यपालन संस्थान ने संयुक्त रूप से भाग लिया।

संगोष्ठी के उद्घाटन समारोह में प्रो.बी के मिश्र, निदेशक, आइएमएमटी, प्रो.वी चन्द्रशेखर, निदेशक, नाइजर, डॉ एस के श्रीवास्तव, प्रधान वैज्ञानिक, सीआइडब्ल्यूए, प्रो, अजय परिड़ा, निदेशक, जीव विज्ञान संस्थान, सीफा एवं श्री बी बी मिश्र, रजिस्ट्रार, एम्स ने भी सभा में उपस्थित सभी प्रतिभागियों को सम्बोधित किया तथा अपने बहुमूल्य विचारों से सब को प्रेरित एवं प्रोत्साहित किया।

(उद्घाटन सत्र में मंचासीन अतिथिगण (बाएं से) श्री बी बी मिश्र, रजिस्ट्रार, एम्स, प्रो. अजय परिड़ा, निदेशक, जीव विज्ञान संस्थान, प्रो. बरदा कांत मिश्र, निदेशक, आइएमएमटी, प्रो. सुधाकर पंडा, निदेशक, आईशक, आईओपी, प्रो. वी. चंद्रशेखर, निदेशक, नाइजर, डॉ. एस. के. श्रीवास्तव, प्रधान वैज्ञानिक, सीवा और श्री ऋषि कुमार रथ, रजिस्ट्रार, भौतिकी संस्थान)

इस संगोष्ठी का मुख्य उद्देश्य शोध संस्थानों में किए जा रहे कार्यों को राजभाषा हिन्दी के माध्यम से जन मानस तक पहुँचाने के साथ इन संस्थानों में विकसित की जा रही तकनीकों, प्रौद्योगिकियों एवं प्रक्रियाओं का उपयोग करके किस तरह हम आर्थिक रूप से स्वावलंबी हो सकते हैं इस पर विस्तार से चर्चा करना है। इसके लिए विज्ञान एवं तकनीक के माध्यम से कम लागत में अधिक उत्पादन, निर्यात-मुख्य प्रौद्योगिकियों का विकास करके एवं भारत निर्माण के माध्यम से आयात को घटाकर भारत को आर्थिक स्वावलंबन की दिशा में आगे ले जा सकते हैं। भारत में विज्ञान एवं प्रौद्योगिकी के क्षेत्र में एक लंबी एवं विशिष्ट परम्परा रही है और इसके महत्वपूर्ण शोध परिणामों एवं उपलब्धियों को कृषि, उद्योग, अंतरिक्ष, परमाणु ऊर्जा, दूर संचार, जैव प्रौद्योगिकी, पर्यावरण, खनिज एवं खनन के क्षेत्रों में देखा गया है।

(संगोष्ठी में उपस्थित प्रतिभागियों का एक दृश्य)

इस संगोष्ठी में विज्ञान एवं प्रौद्योगिकी के विभिन्न क्षेत्रों से जुड़े लगभग १०५ प्रतिभागियों ने भाग लिया तथा १० वक्ताओं ने विभिन्न विषयों पर अपना उच्च स्तरीय शोध पत्र प्रस्तुत किया।

कृषिरत महिलाओं के आर्थिक स्वावलंबन में भा.कु.अ.प-केंद्रीय कृषिरत महिला संस्थान की भूमिका पर गायत्री महारणा, केंद्रीय कृषिरत महिला संस्थान ने, वैज्ञानिक विधि में मुर्गी पालन द्वारा ग्रामीण महिलाओं का आर्थिक सशक्तिकरण पर डॉ. अनंत सरकार, केंद्रीय कृषिरत महिला संस्थान ने अपने अपने शोध कार्यों को प्रस्तुत किया।

शोध पत्रों के प्रस्तुतीकरण से सभी प्रतिभागीगण काफी लाभान्वित हुए तथा यह विचार प्रकट किया गया कि इस तरह के आयोजन को एक नियमित अंतराल में अवश्य आयोजित किया जाना चाहिए जिससे लोगों में विज्ञान एवं प्रौद्योगिकी के प्रति अभिरुचि जागृत की जा सके।

AWARDS AND RECOGNITION

Dr. Jatinder Kistwarla

- 'Krushi Ratna' from Orissa Krushak Samaj, Bhubaneswar on the occasion of World Food Day, 2016
- Chairman, Advisory Committee, "Provision of Gender Friendly Farm Tools for Farm Women in Watershed Areas" under livelihood component of PMKSY: Watershed Development

Dr. Santosh Kumar Srivastava

- Coordinator, Organising Committee, संयुक्त राजभाषा वैज्ञानिक संगोष्ठी on आर्थिक स्वावलंबन में वैज्ञानिक एवं तकनीकी संस्थानों की भूमिका on 27 फरवर, 2017
- Chairman, Technical Session-I, during संयुक्त राजभाषा वैज्ञानिक संगोष्ठी on आर्थिक स्वावलंबन में वैज्ञानिक एवं तकनीकी संस्थानों की on 27 फरवरी, 2017
- Chairman, Technical Session-I, Agriculture and Allied Sector, National Workshop on Empowering Communities through Community Radio on 14 February, 2017
- Chairperson, Technical Session-I, National level workshop on Mitigating Drudgery of Farm Women : Adoption of Gender Friendly Technologies on 15 September, 2016
- Member, Advisory Committee, National Level Workshop on Mitigating Drudgery of Farm Women : Adoption of Gender Friendly Technologies during 15-16 September, 2016
- Member, Editorial Advisory Board, Amity Journal of Agribusiness

Dr. Naresh Babu

- Mentor of +2 vocational pass out Sri Samir Kumar Sa and Sri Binay Kumar Meher apprentices for Apprenticeship training in the Horticulture for period of one year.
- External Member, selection of JRF under "Development of National Database on Mango" Central Horticultural Experiment Station, Bhubaneswar, 16 November, 2016
- External Member, selection of SRF and Skilled Worker under "Investigation on sooty blotch fly speck complex in mango and pathological status of *Pyricularia species* in banana and devising management strategies", Central Horticultural Experiment Station, Bhubaneswar, 27 January, 2017

Dr. Sabita Mishra

- Member, Editorial Board, Indian Society of Extension Education, IARI, New Delhi.
- Member, Editorial Board, Odisha Society of Extension Education, OUAT, Bhubaneswar.
- Member, Editorial Board, *Amity Journal of Agribusiness* (AJAB), AMITY Business School, New Delhi
- Reviewer, Karnataka Journal of Agricultural Sciences.
- External Examiner, M.Sc. thesis, "Effect of trainings conducted for rural women by district agricultural training centre", UAS, Dharwad
- Resource Person, IMAGE, Bhubaneswar, 8-11 November, 2016
- Member, Institute Management Committee by ICAR, New Delhi for 6th IMC meeting of ICAR-ATARI, Zone VII, Jabalpur, MP, 1 December, 2016
- Resource Person, Minor Irrigation and Water Use, Bhubaneswar December, 21-23, 2016.
- Chief Guest, Annual Function, Angel Play School, Bhubaneswar, January 29, 2017
- Member- Expert, DPC, Probation clearance of ARS Scientist in the Discipline of Agriculture Extension, ICAR-CIFA, 23 February, 2017

Dr. Arun Kumar Panda

- Best Paper, X Biennial Animal Nutrition Association Conference, SVVU, Tirupati, 9-11 November, 2016.
- Certificate of Excellence, International Journal of Livestock Research, 2016-17.
- Member, International Advisory Board, The Journal of Poultry Science Japan
- Section Editor, Brazilian Journal of Animal Sciences
- Editor, Indian Journal of Poultry Sciences
- Co-Chairman, Session, "Feed Additives In Poultry Health and Production Disease Resistance and Immunomodulation", III AAHP Convention & National Symposium, Poultry Health and Welfare, 20-21, October, ICAR-CCARI, Goa.
- Resource Person, Presentation, "Poultry Scenario and Management for the training programme on Poultry and Small Animal Production", Veterinary Officers Training Institute, Laxmisagar, Bhubaneswar on 6 December, 2016 & 10 January 2017

- Resource Person, Presentation, "Poultry Farm Management", Induction Training Programme, Frozen Semen Bank, Cuttack on 9 November, 2016
- Resource Person, Presentation "Human Health Hazards from Poultry Farming", World Veterinary Day, Directorate of Animal Husbandry and Veterinary Services Cuttack, 30 April, 2016
- Resource Person, Presentation, "Control of Avian Influenza", Assistance to State for control of Animal Diseases, (ASCAD), Veterinary Officers Training Institute, Laxmisagar, Bhubaneswar, 17 October, 2017

Dr Biswanath Sahoo

- Reviewer Indian Journal of Animal Sciences, Animal Nutrition and Feed Technology, International Journal of applied animal research
- Rapporteure, X Biennial conference of Animal Nutrition Association, Tirupati, 09-11 November, 2016.
- Evaluator, P.G Thesis & Viva-voce(4), M.V.Sc II, Animal Nutrition, College of Veterinary Science and Animal Husbandry, O.U.A & T, Odisha, Bhubaneswar, 12 July, 2016
- External Examiner, Course No. ANN-111, ANN-121 and ANN-211, College of Veterinary Science and Animal Husbandry, O.U.A & T, Odisha, Bhubaneswar 17 September, 2016

Dr Jyoti Nayak

- Resource Person, Lecture, "Farm mechanization in agriculture and allied sectors" Office of the Agronomist, M.I&W.U, Baramunda, Bhubaneswar, 13 May, 2016
- Member Secretary, Advisory Committee, " Provision of Gender Friendly Farm Tools for Farm Women in Watershed Areas" under livelihood component of PMKSY : Watershed Development
- External Examiner, B.Sc (Home Science), College of Home Science, OUAT, Bhubaneswar 18-19 July, 2016 and 27 January, 2017
- Faculty Counsellor, (Home Science) in the Executive body of Orissa Society of Extension Education, 2016-17

Dr.J.C Jeeva

- Editor, Journal titled "Fishery Technology"

Dr. Ananta Sarkar

- Member, Governing Body, Society for Application of Statistics in Agriculture and Allied Sciences (SASAA), BCKV, Mohanpur, Nadia, West Bengal
- Member, Editorial Board, RASHI: Journal of the Society for Application of Statistics in Agriculture and Allied Sciences (SASAA), BCKV, Mohanpur, Nadia, West Bengal
- External Examiner, "Non-Parametric Statistics", College of Post-Graduate Studies, Central Agricultural University (CAU), Meghalaya
- Best poster titled "Nitrogen Nutrition and Salicylic Acid Induced Defense Responses against Bacterial Blight Disease in Pomegranate", 7th Indian Horticulture Congress-2016: An International Meet on Doubling Farmers Income through Horticulture, IARI, New Delhi, 15-18 November, 2016

Dr Tanuja S

- External examiner "Navigation and Seamanship, PHT 313" College of Fisheries, Rangailunda, Berhampur, OUAT, Bhubaneswar 19 January, 2017
- Reviewer, Journal of Food Biochemistry, Journal of food processing and preservation

Ms Gayatri Moharana

- Resource Person, Lecture, " Drudgery of Farm Women and Women Friendly Farm Implements" Office of the Agronomist, M.I&W.U, Baramunda, Bhubaneswar, 26 October, 2016
- Chairman, Core Committee, " Provision of Gender Friendly Farm Tools for Farm Women in Watershed Areas" under livelihood component of PMKSY : Watershed Development
- Question Setter, "Consumer Ergonomics, FRM-502, M.Sc. (Home Science)", Department of Family Resource Management, College of Home Science, OUAT, Bhubaneswar, 2015-2016.
- External Examiner & Question Setter " Scale and Perspective drawing, HRM-429", B.Sc (Home Science), College of Home Science, G. B. Pant University of Agriculture and Technology, 2015-16.

Er. Chaitrali Mhatre

- Member, Core Committee, " Provision of Gender Friendly Farm Tools for Farm Women in Watershed Areas" under livelihood component of PMKSY : Watershed Development

Mass Media Programs/ Radio talk

1. B. Sahoo. Gramanchal mahilanka adhika aya pain Chheli o mendha palan. Broadcasted on 25.01.2017.

TV Radio

ICAR- CIWA

Dr. Arun Kumar Panda

- Delivered radio talk on "Mukta aganare kukuda palana madhyamare mahila sasakti karan" in Krushi sansar programme (Broadcast 7.30 PM on 28.12.16) of All India Radio on 22.12.16. (*transfer to radio talks*)

Gayatri Moharana

- **Delivered a** Radio talk on on Krushijibi mahilanka shramajanita samasya o ehara samadhan in krushi sansar recorded on 2.3.2017 and telecasted on 8.3.17 by All India Radio, Cuttack

Dr. L.P Sahoo

- 1) Seed Treatment for kharif crops In Krishi sikshya programme- 30.06.2017 (Date of recording)
- 2) Seed production of pulses for enhancing income of farmwomen In Krushi Sansar programme- 02.03.2017 (Date of recording)

Dr. Sabita Mishra

- Dr. Sabita Mishra delivered a talk on "Bhumihina Krushi Jibi Mahilanka Pain Krushi Udyoga on 19.01.2017 at AIR, Cuttack.

- Dr. Sabita Mishra delivered a talk on Capacity Building and Income Generation of Farm Women on 01.02.2017 with IIEC and Radio Surabhi.

AICRP on Home Science

- Dr. A. Mrunalini participated as a resource person in a live program "Annapurna" telecasted on 7th March 2016 by TV5 – News Channel on Awareness of AICRP Home Science technologies.
- A. Padma delivered radio talk on "Women in Agriculture" in TV-5 on 16th April, 2016.
- Dr. Gaytri Tiwari delivered talk on 'Psychosocial problem of youth' at MY FM, Udaipur on 10th July, 2016.
- Dr. Jayshree Zend interviewed on Gramin Mahilasathi Pushpa Sajawat-Ek Uttam Vyavasay at AIR Parbhani. The programme was broadcasted in Amacha Ghar – Amacha Shivar on 16th August, 2016 at 7.30 pm.
- Dr. Gaytri Tiwari delivered talk on 'Mahilao me kohsal vikasat', Aakashwani, Udaipur on 15th November, 2016.
- Dr. Jayshree Zend Interviewed on 'Mahila shetakaryanche sharirik ajar wa dhoke' at AIR Parbhani. The programme was broadcasted in Amacha Ghar–Amacha Shivar on 17th November, 2016 at 7.30 pm.

PUBLICATIONS

Publications (ICAR-CIWA)

A. Research Papers

1. Anil Kumar, Behera, Binita and Jeeva, J. C. 2017. Gender indices as influenced by different levels of female literacy in Odisha. *Int. J. Dev. Res.*, 7(1): 10924-10928.
2. Jeyanthi, P., Balasubramaniam, S. and Charles Jeeva, J. 2016. Socio-economic status of fishermen operating FRP boats in Nagapattinam District, Tamil Nadu: a special focus on poverty and income inequality. *Indian Journal of Fisheries*, 63(2): 151-153.
3. Kushagra, J., Gayatri, M. and Jeeva, J. C. 2016. Assessment of Nutritional Status of Tribal Children: A Case of Bhumija Munda tribe of Mayurbhanj. *Journal of Agroecology and Natural Resource Management*, 3(3): 329-332.
4. Maity, A., Sharma, J., Sarkar, A., More, Amarja K. and Pal, R. K. 2016. Nutrient imbalance indices are closely related with susceptibility of pomegranate to bacterial blight disease. *Scientia Horticulturae*, 211: 79-86.
5. Nayak, J., Moharana, G. and Rout, P. K. 2016. Impact of Training programme on Farmer's skill, knowledge and adoption of technology. *Journal of Extension Education*, XXI(1): 104-107.
6. Panda Sasmita, Babu Laxman Kumar, Panda Arun Kumar, Tanuja S., Mohanty Anurag, Panigrahy Kuldeep Kumar and Samal Pinaki. 2017. Effect of dietary supplementation of fermented fish silage on serum-biochemical parameters of broiler Japanese quails (*Coturnix coturnix japonica*). *Veterinary World*, 10(4): 380-385.
7. Panda, A. K. and Cherian Gita. 2017. Tissue tocopherol status, meat lipid stability, and serum lipids in broiler chickens fed *Artemisia annua*. *European Journal of Lipid Science and Technology*, 119(2): DOI: 10.1002/ejlt.201500438.
8. Panda, A. K., Sridhar, K., Lavanya, G., Prakash, B., Rama Rao S. V. and Raju, M. V. L. N. 2016. Effect of dietary incorporation of fish oil on performance, carcass characteristics, meat fatty acid profile and sensory attributes of meat in broiler chickens. *Animal Nutrition and Feed Technology*, 16: 417-425.
9. Panda, A. K., Sridhar, K., Prakash, B., Rama Rao, S. V. and Raju, M. V. L. N. 2016. Acidulated Sunflower Soapstock as an Energy Source in the Diet of Broiler Chickens. *Animal Nutrition and Feed Technology*, 16: 337-344.
10. Patra, C., Sahoo, L.P. and Saroj Kumar Mohanty. 2017. Dormancy behaviour of developing seeds in different Genotypes of chilli (*Capsicum Annuum* L.). *International Journal of Science, Environment and Technology*, 6(1): 40-49.
11. Patra, C., Sahoo, L.P., Mohanty S.K. and Dash, S. 2016. Effect of Bio fertilizer and micro nutrients on growth and seed yield in Tomato (*Lycopersicon esculentum* mill.). *The Bio scan*, 11(4): 2349-2353.
12. Patra, C., Sahoo, L.P., Sasamala, A. C. and Mohanty S.K. 2016. Studying the effect of different fruit and seed drying methods on seed quality of two different genotypes of chilli (*Capsicum annuum* L.). *International Journal of Science, Environment and Technology*, 5(5): 3262-3270.
13. Prakash, B., Rama Rao, S. V., Raju, M. V. L. N. Reddy, K. K. and Panda A. K. and Reddy P. V. Mallikarjuna 2016. Effect of supplementing encapsulated microbial enzymes to corn-soybean meal based pelleted diets on performance and carcass variables in coloured broiler chicken. *Indian Journal of Animal Sciences*, 86(7): 840-842.
14. Raju M. V. L. N., Prakash B., Nagarjuna B. V. R., Nischala T., Rama Rao S. V., Reddy, M. R. and Panda A. K. 2016. inclusion of solvent extracted karanj (*Pongamia glabra*) cake in the diet and production performance of layer chicken. *Indian Journal of Animal Nutrition*, 33: 81-85.
15. Raju, M. V. L. N., Chakrabarti, P. P., Sujatha, V., Reddy, J. R. C., Rama Rao, S. V., Rao, B. V. S. K., Panda, A. K., Prabhavathi Devi B. L. A., Shyam Sunder, G. and Prasad R. B. N. 2017. Comparative evaluation of lysolecithin from rice bran oil *vis-à-vis* lipotropic agents in broiler chicken diet. *Indian Journal of Animal Sciences*, 87(2): 241-244.
16. Rama Rao, S. V., Naga Raja Kumari, K., Raju, M. V. L. N. and Panda, A. K. 2016. Utilization of decorticated, low gossypol cotton seed meal in WL layer diets. *Indian Journal of Poultry Science*, 51(1): 65-69.
17. Rama Rao, S. V., Prakash, B., Raju, M. V. L. N., Panda, A. K., Kumari R. K. and Reddy, E. Pradeep Kumar. 2016. Effect of supplementing organic form of zinc, selenium and chromium on performance, anti-oxidant and immune responses in broiler chicken

- reared in tropical summer. *Biological Trace Element Research*, 172: 511-520.
18. Ray, S., Mohapatra, I.; Rout, R. N., Nayak, J. and Panda, M. 2017. Skin diseases among farmers in rural areas of a coastal block, eastern India. *International Journal of Current Research*, 9 (1): 45082-45086.
 19. Rayala Reddy, V., Ravinder Reddy, V., Panda, A. K., Chinni Preetam, V. and Baswa Reddy, P. 2016. Influence of dietary supplementation of synbiotics as an alternative to antibiotic growth promoters on performance, ultrastructure and histomorphology of gut integrity in broilers. *International Journal of Livestock Research*, 6(11): 37-45.
 20. Sahoo, B., A. K. Garg, R. K. Mohanta, R. Bhar, P. Thirumurgan, A. K. Sharma and A. B. Pandey. 2016. Nutritional value and tannin profile of forest foliages in temperate sub-Himalayas. *Range Mgmt. & Agroforestry*, 37(2): 228-232.
 21. Sahoo, L. P., Argade, S. D. and Sasamala, A. C. 2016. Farm Women and Seeds: Strengthening Relation for Sustaining Agricultural Productivity. *Current Science*, 110(8): 1389-1390.
 22. Sandip Shil, Kishor K. Das and Sarkar, A. 2016. Normalization of gene expression data using support vector machine approach. *Electronic Journal of Applied Statistical Analysis*, 9(1): 95-110.
 23. Sarangi, N. R., Babu, L. K., Kumar, A., Pradhan, C. R., Pati, P. K. and Mishra, J. P. 2016. Effect of dietary supplementation of prebiotic, probiotic, and synbiotic on growth performance and carcass characteristics of broiler chickens. *Veterinary World*, 9(3): 313-319.
 24. T. B. Bagchi, P. Sanghamitra, J. Berliner, K. Chattopadhyay, A. Sarkar, A. Kumar, S. Ray and S. G. Sharma. 2016. Assessment of physico-chemical, functional and nutritional properties of raw and traditional popped rice. *Indian Journal of Traditional Knowledge*, 15(4): 659-668.
 25. Tanuja, S., Anil Kumar and S. K. Nayak. 2016. Effect of dietary intake of acid ensiled fish waste on the growth, feed utilization, hematology and serum biochemistry of rohu (*Labeo rohita*, (Hamilton, 1822)) fingerlings. *Indian Journal of Animal Research*, 51(3): 501-505.
 26. Tanuja, S., Anil Kumar, Nayak S. K. and Sarkar, A. 2016. Effect of dietary supplementation of acid ensiled fish waste on the growth carcass quality and serum biochemistry in Vanraja chicken. *Indian Veterinary Journal*, 93(10): 45-47.
 27. Tanuja, S., Anil Kumar, Sarkar, A. and Nayak, S. K. 2016. Biochemical and microbiological quality of fermented silage prepared from dressing waste of Indian major carps using different concentrations of jaggery. *Indian Journal of Fisheries*, 63(3): 94-98.
 28. Wadkar, S. K., Mohammad, A., Argade, S. D., Prabrugouda, K. and Kale, R. B. 2016. End-users Attitude Towards the aAQUA e-Agriservice: Dairy Farmers Perspective in Maharashtra. *International Journal of Basic and Applied Agricultural Research*, 14(3): 313-317.
 29. Wadkar, S. K., Singh, K., Chakravarty, R. and Argade, S. D. 2016. Assessing the Reliability of Attitude Scale by Cronbach's Alpha. *Journal of Global Communication*, 9(2): 113-117.
 30. Wadkar, S. K., Singh, K., Kadian, K. S., Chakravarty, R. and Argade, S. D. 2016. Development of a Knowledge Test to Assess Knowledge Level about Improved Dairy Farming Practices among Users and Non-users of e-Agriservice in Maharashtra. *Journal of Agricultural Extension Management*, XVII(2): 81-89.
- B. Popular Articles**
1. Argade, S. D., Sarkar, A. and Wadkar, S. K. 2016. Krushirat Mahila: Badhati Jimmedariyan Aur Chunnotiyan. *Grameen Vikas Samiksha*, 57: 152-155.
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- D. Abstracts/ Presentation in conferences/ seminars/ workshop**
1. अनंत सरकार, सबिता मशिरा, अनलि कुमार, बी. सी. बेहेरा और सुब्रत कुमार दास. 2017. वैज्ञानिक बर्धन से मुरगी पालन द्वारा ग्रामीण महिलाओं का आर्थिक सशक्तिकरण. हर्षि संगोष्ठी on आर्थिक स्वालंबन में वैज्ञानिक तथा तकनीक संस्थानों की भूमिका. भौतिकी संस्थान, भुवनेश्वर. फरवरी 27, 2017. (मौखिक प्रस्तुति-अनंत सरकार)
 2. Anil Kumar, Sahoo, B., Tanuja, S., Shivaji, D. A. and S. K. Nayak. 2017. Abstract on Prioritizing districts for fodder production in Odisha for the National

- Symposium on New Directions in managing forage resources and livestock productivity in 21st century: challenges and opportunities. 3-4 March, 2017, Range Management Society of India, Jhansi and Rajmata Vijayaraje Sindhia Krishi Vishwa Vidyalaya, Gwalior.
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 4. आयत्री महारणा, जतदिर कश्तिवारया, ज्योतनायक, आभा सहि एवं मोना कुमारी. 2017. कृषरित महललओ के आर्थकि स्वावलंबन में भा.कृ.अनु.प.-केंद्रीय कृषरित महलल संस्थान की भूमकि. हर्दी संगोष्ठी on आर्थकि स्वावलंबन में बैज्ञानकि तथा तकनीक संस्थानों की भूमकि. भौतकि संस्थान, भुवनेश्वर. फरवरी 27, 2017. (मौखकि प्रस्तुत-गायत्री महारणा)
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 6. Lakshmi G., Kumari N. N., Panda A. K., Raghunandan T. and Sridhar K. 2016. Effect of dietary inclusion of Distillers Dried Grains with Solubles (DDGS) with enzyme supplementation on growth performance, Carcass characteristics, bone strength and serum biochemical parameters of broiler chicken. ANACON-2016, 9-11 November, 2016, Tirupati. pp: 84.
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 14. Srivastava, S. K. and Babu, N. 2016. Protected cultivation of vegetable crops: A step towards farm women prosperity (Invited Paper). Souvenir: Horticultural Diversity for Prosperity. The Orissa Horticultural Society, Bhubaneswar and OUAT, Bhubaneswar: 76-82.
 15. Srivastava, S. K. and Babu, N. 2016. Behavioral study of brinjal shoot and fruit borer (*Leucinodes orbonalis* Guenee) in Coastal Agro Eco- System of Odisha. 4th National Symposium of SPEE on New Horizons Pest Management for Sustainable Developmental Goals. 23-24 December, 2016. OUAT, Bhubaneswar.

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13. Deepika, J. and Mrunalini, A. 2016. Assessment of plant nursery enterprises in Hyderabad and Secunderabad. *International Journal of Environmental Science, Ecology, Family and Urban Studies* 6(5): 75-80.
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19. Gahlot, M., Singh, J. and Joshi, J. 2016. Efficacy of cotton printed fabric of cutch dye (*Acacia Catechu*) Using *Cassia Tora* Gum. *Man-Made Textiles in India*, 64(10): 351-354.
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PUBLICATIONS (AICRP on Home Science)

a) Research Papers

1. Aggarwal, S. and Singla, N. 2016. Obesity in relation to risk factors of cardiovascular disease among women from low, middle and high income group. *Indian Journal of Nutrition and Dietetics*, 53(4): 447-58.
2. Aneja, A., Duhan, K., and Sangwan, S. 2016. Rationale of scholastic backwardness in rural children. *American International Journal of Research in Humanities, Arts and Social Sciences*, 59-62.
3. Antwal P N. and C. M. Bellurkar. 2016. Gender Perspectives in Use of Extension Services in Maharashtra. *Agriculture Update*.
4. Antwal P. N., C. M. Bellurkar and Rathod S. M. 2016. Empowerment of Women Self Help Groups in Maharashtra *Journal of Multilogic Science*.
5. Babel, S. and Gupta, R. 2016. Silk printing with natural thickening agent and evaluation of colour fastness properties. *Manmade Textiles in India*. 64(3): 99-103.
6. Babel, S. and Gupta, R. 2016. Screen printing on silk fabric using natural dyes and natural thickening agent. *J. Textile Sci. Engg.*, 6(1): 230.
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26. Kamalaja, T., Prashanti, M. and Mrunalini, A. 2016. Assessment of physical fitness in female adults using treadmill tests in relation to Haemoglobin levels. *International Journal of Advanced Research*, 4 (7): 318-321.
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35. Meghwal, J. and Singh, V. 2016. Food consumption pattern and dietary intake of Kathodi Tribe of Udaipur District, Rajasthan. *Indian Journal of Social Research*, 57 (2): 271-282.
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37. Mrunalini, A. and Deepika, J. 2016. Physiological stress of women working in paddy transplantation activity. *International Journal of Agricultural Science and Research*, 6 (2): 263-268.
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52. Renuka, S. S., Geeta, C., Ashwini, M. and Shreedevi, B. M. 2016. Assessment of drudgery reducing tool-Harvest bag (cot bag) used by the farm women for harvesting chilli. *International Journal of Farm Sciences*, 6 (4): 1-10.
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72. Yadav, S. and Gaba, G. 2016. Market potential of value added khadi products. *PARIPEX- Indian Journal of Research*, 5 (9): 291-294.
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Abstracts in Conference/Workshop

1. Chawla, A. and Krushnapriya. 2016. Readiness for marriage (Physiological, Social, Psychological, Economical and other factors). In *Textbook of Dynamics of Marriage and Family*. Agrotech Publishing Academy, Udaipur. pp: 33-38.
2. Chikkangoudar, R. N. and Hunshal, C, H. 2016. Emotional intelligence and family environment of school children. *Souvenir: Home Science Association of India*, RHSc, UAS, Dharwad. January 28-30, 2016, College of Rural Home Science, University of Agricultural Sciences, Dharwad. pp. 149.
3. Das, M. D., Deka, M. B., Islam, S. S. and Saikia, P. 2016. Socio-economic empowerment of rural women through self help group. In *Self Help Groups Problems, Opportunities and Challenges ahead*, pp: 33-44.
4. Deka, M. B., Saikia, R. M., Saikia, P. and Das, M. D. 2016. SHG: A key step towards gender equality. In *Self Help Groups Problems, Opportunities and Challenges Ahead*, pp: 85-97.
5. Gautam, S. and Sharma, A. 2016. Natural silk printing with *Eupatorium adenophorum* leaves – A step towards eco-friendly products. *Proceedings of the International Conference on Redefining Textiles: Cutting Edge Technology of the Future*, 8-10 April, 2016 at Jalandhar, Punjab. pp: 889-899.
6. Hunshal, S. C., Pujar, L. L. and Bhat, P. 2016. Concept development among pre-school children: An intervention study. 31st Biennial National Conference of HSAI on *Science & Technology for Reaching the Unreached*, College of RHSc., UAS, Dharwad, January 28-30, 2016. pp: 149.
7. Khan, T. N., Magar, M. A., Nerlekar, J. P. and Bhoyar, A. M. 2016. Evaluation of nutritional status of rural adolescent girls. 48th Annual National Conference of Nutrition Society of India, Bangaluru, 4 to 5 November, 2016.
8. Pujar, L. L. and Patil, S. S, 2016. Educational empowerment of rural adolescent girls on life skills, Sovenior, of 31st Biennial National Conference of HSAI on "Science & Technology for Reaching the Unreached" at College of RHSc, UAS, Dharwad, 225, 28 to 30 January 2016.
9. Pujar, L. L. and Patil, S. S. 2016. Educational empowerment of rural adolescent girls on life skills. 31st Biennial National Conference of HSAI on *Science & Technology for Reaching the Unreached*, College of RHSc., UAS, Dharwad, January 28 to 30, 2016. Pp: 225.

10. Singh, P., Tewari, P. and Rani, S. 2016. Community mobilization through Self Help Groups. National Conference on *Hill Agriculture in Perspective*, Directorate of Research, G. B. P. U. A. T., Pantnagar, February 26-28.
11. Vasan, A., Boora, P. and Mani, M. 2016. Nutritional evaluation of pasta blended with barley flour: Demand driven value addition. International Conference on *New Approaches in Biotechnology & Biosciences*, Post Graduate Department of Biotechnology, Raja Balwant Singh Engineering Technical Campus, Bichpuri, (Agra), February 18-20, 2016. Pp: 43.

Popular Articles

1. Aggarwal, S., Singla, N. and Singla, P. 2016. Obesity- A risk to life. *Social Welfare*, 37.
2. Antwal, P., Bellurkar, C. and Rathod, S. 2016. Ghod daud maharashtraatil mahila bachat gatanchi. *Shetibhati*, 33-34.
3. Gogoi, M. 2016. Brashartra Udyogot Bhindi aahar Bhumika, *Dainik Janambhumi, Local Daily news paper*, 23rd June.
4. Khan, T. N. and Nerlekar, J. 2016. Nyahari. *Sheti bhati*, March.
5. Khan, T. N., Bhoyar, A. and Nalwade, V. 2016. Janun gheu annabhesalivishayi. *Sheti bhati Mahila Visheshank*, January 2016.
6. Rana, A., Vyas, N. and Kishtwaria, J. 2016 (January - June). Karya Sarlikaran dwara mahila sashktikaran. *Parvatiya Khetibari*, 1-2 (36): 10.
7. Singh, P. 2016. Self Help Groups and their sustainability. *Indian Farmer Digest*, 49 (1): 36-38.
8. Zend, J. and Revanwar, M. 2016. Rop lavanisathi surakshitsanch. *Sheti- Bhati*, 19-20.

Leaflets/Folders/Pamphlets/Booklets

9. Chawla, A., Kanwar, V. and Mahal, R. 2016. Role of parents and teachers in enhancing academic performance of children.
10. Chawla, A., Kanwar, V. and Mahal, R. 2016. Behaviour problems of adolescents.
11. Chawla, A., Kanwar, V. and Mahal, R. 2016. Reproductive health and hygiene of adolescents.
12. Chawla, A., Kanwar, V. and Mahal, R. 2016. Developing the habit of reading among children.

13. Chawla, A. Kanwar V., Princy, 2015. Importance of girl's education.
14. Chawla, A., Kanwar, V., Mahal, R. 2016. Selecting vocation for career development.
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TRAINING AND CAPACITY BUILDING

(i) Brainstorming Workshop on "Bridging the Gaps in Gender Research"

A two-day Brainstorming Workshop on 'Bridging the Gaps in Gender Research' was conducted during 1-2 June, 2016 at ICAR-Central Institute for Women in Agriculture, Bhubaneswar. More than 50 Scientists of ICAR-CIWA and AICRP (Home Science) representing 11 states of India and 14 guest experts from fields of gender, nutrition, extension, and ergonomics participated in the workshop. Among the experts who made presentations on the topics related to above mentioned areas were Dr. Vinita Sharma, Dr. V. V. Sadamate, Dr. Aasha Kapur Mehta, Dr. R. Rengalakshmi, Dr. B. N. Sadangi, Dr. Kinkini Dasgupta Mishra, Dr. P. K. Nag, Dr. L. P. Gite, Dr. Jatinder Kaur Arora and Dr. B. Sesikeran.

In second day, guest experts and scientists formed five groups (Drudgery reduction, Textiles, Food and Nutrition, Extension, Human development) according to the given thematic areas and deliberated upon concepts to finalize the projects.

Some of the salient recommendations of the workshop are:

- In total 32 project proposals were discussed.
- Scientists should focus on "Solution Science" i.e. giving solutions to the problems of society through appropriate projects,
- Projects may also keep in view the Sustainable Development Goals (SDGs) of the UN and the National goals,
- Projects should be interdisciplinary, focused and women centric.
- ICAR-CIWA should be partner with other organizations to address issues like unequal access of women to extension and other services, drudgery of women,
- Collaboration with development departments is essential to understand and address gender issues in programmes and policies of the government,

- Outputs from research projects should be of high quality for uptake by government departments, NGOs and other relevant agencies.



(ii) Training on gender mainstreaming and women empowerment

ICAR - Central Institute for Women in Agriculture imparted training on gender mainstreaming and women empowerment to Scientists of Bihar Agriculture University, Sabour during 23-25 August, 2016. Lectures were delivered on drudgery of farm women in agriculture and techniques for assessment of drudgery, gender issues in agriculture, role of women in livestock management etc. Twenty five nos. of scientists and Subject Matter Specialists of BAU, Sabour were sensitized for developing gender inclusive research activities.

iii) The Women Leadership for Impact Course (21-27 October, 2016)

A Training Programme was organized on "Women Leadership for Impact" during 21-27 October, 2016 by International Rice Research Institute, Philippines at ICAR-Central Institute for Women in Agriculture, Bhubaneswar.

Representatives from different NGOs working towards agriculture and livelihood in Odisha participated in the programme. It was a very educative event in which 20 participants participated and shared their varied experiences for building the women leadership.

Dr. Myriam Morgenstein, IRRI, initiated the programme. Eminent scientists and experts from different institutes such as Dr. Ahmad Salahuddin of Access Agriculture, Dr. Poornima Shankar, IRRI (India Office), Dr. Jatinder Kishitwaria, Dr. Sabita Mishra and Dr. Jyoti Nayak of ICAR-CIWA, Dr. Tushar Nayak, MSSRF, Mr. Suryakanta Khandei and Ms. Bharti, IRRI, Ms. Ronali Pradhan, Digital Green and Mr. Dibyakanta, Reliance Foundation contributed immensely in putting forth their ideas regarding empowerment and leadership issues of women in agriculture, women friendly technology, business principles and models for agriculture, nature of leadership, the art of listening, finance and accountancy, SWOT analysis, positive deviants, extension methods for scaling up impact, self awareness and priorities of rural women and men in agriculture etc.

There was a great synergy created when all these persons came together to talk about and churn out skills for leadership to ensure that the benefits of development to reach women as much as men.



Dr. Jatinder Kishitwaria during her session on leadership



Resource persons from IRRI sharing about usage of rice transplanter in the Technology Fair



PRA in full swing at Padasahi village



PRA in full swing at Padasahi village Myriam, IRRI during her session on emotional intelligence

(iii) Training on 'Manufacture of Jute Handicrafts'

Six days training program on 'Manufacture of Jute Handicrafts' was conducted in collaboration with ICAR-NIRJAFT, Kolkata from 17 – 22 Oct., 2016 at ICAR – CIWA, Bhubaneswar. Fifteen women attended this training program. In the inaugural session on 17 Oct., 2016.

Dr. Jatinder Kishtwaria, ICAR - CIWA emphasized on group dynamic, establishment of entrepreneurship and market linkages through this training program. Dr. A. N. Roy, Director, ICAR - NIRJAFT, Kolkata highlighted the importance of jute in the present scenario and advised the trainees to make handicraft products in a group.

All the prepared jute items like bags, dolls, wall hangings, mats etc made by trainees during the training program were exhibited and highly appreciated by all.

This program was coordinated by Dr. Sabita Mishra, Dr. Jyoti Nayak, Dr. Laxmikanta Nayak.



(iv) Model Training Course on 'Promoting Occupational Safety and Drudgery Reduction among Farm Women'

To improve the professional competence and upgrade the knowledge and develop technical skills of subject matter specialists/ extension workers and to improve an opportunity of experience sharing, problem solving and interaction between experts and subject matter specialists a Model Training Course entitled 'Promoting occupational safety and drudgery reduction among farm women' was conducted for 8 days during 3-10 November, 2016, which was sponsored by Department of Agriculture and Cooperation, Directorate of Extension, New Delhi, Govt of India.

Total 13 numbers of participants from 2 states attended the training programme. The lectures were planned on different issues related to occupational health hazard, safety and drudgery reduction of farm women.

The training programme was conducted through lectures, demonstrations, video shows, field visits etc. Pre as well as post evaluation of the training programme was conducted. Overall grading by the participants was 3.6 on the scale of 1-4.

The MTC was coordinated by Dr Jyoti Nayak, Dr Abha Singh and Miss Gayatri Moharana.





(v) ICAR Sponsored Short Course on "Empowerment of Farm Women through Livestock and Poultry Interventions Organized at ICAR-CIWA, Bhubaneswar"

The ICAR Sponsored Short Course on "Empowerment of Farm Women through Livestock and Poultry Interventions" was organized during 21-30 November, 2016 at ICAR-CIWA Bhubaneswar. The programme was graced by the Chief guest Dr. Jatinder Kishtwaria, Director, ICAR-CIWA, guest of honour Dr. R. C. Patra, Dean, CVSc &AH, OUAT, Bhubaneswar. Eighteen participants from across the country participated in the short course. A total of 32 theory and practical classes were covered on various aspects like "Gender Issues in Livestock and Poultry Sector, Food and Nutritional Security Through Animal Agriculture, Livelihood Improvement of Farm Women Through Livestock Farming, Women Empowerment and Livelihood Security Through Small Ruminant Production, Extension Strategies for Socio Economic Empowerment of Women Through Livestock Farming, Family Poultry for Poverty Alleviation and Gender Equity in India, Drudgery and Ergonomics in Animal Farming : Implications for Women, Entrepreneurship Development Through Livestock and Poultry Farming and Climate Resilient Livestock Production. The participants also made exposure visit to local ICAR institutes in Bhubaneswar and field visit to ICAR-CIWA adopted village. The course was organized by Dr. A. K. Panda, Dr. Anil Kumar, Dr. B. Sahoo and Dr. Tanuja, S.



(vi) ICAR-CIWA Organizes Short Course on "Integrated Farming System: An Approach towards Livelihood Improvement of Farm Women and Natural Resource Conservation"

The ICAR Sponsored Short Course on "Integrated Farming System: An Approach towards Livelihood Improvement of Farm Women and Natural Resource Conservation" was organised for the agricultural research and development personnel during December 14 - 23, 2016 at ICAR-CIWA, Bhubaneswar. Dr. Jatinder Kishtwaria, highlighted the role of IFS in present agricultural scenario as well as role of women in natural resource conservation. Twelve participants from 5 States and 9 Disciplines participated in the short course. Totally 25 Experts delivered talk on different aspects of Integrated Farming Systems and Natural Resource Conservation. During the course, 33 (theory- 25 and practical- 8) classes were conducted on various aspects like IFS and natural resource conservation: Importance and concept, gender issues in agriculture especially in IFS

and natural resource conservation, role of women in IFS and natural resource conservation, food and nutritional security through IFS, optimizing water productivity through IFS and natural resource conservation, livelihood enhancement of farm families through integration of different farm enterprises and natural resource conservation practices, impact assessment of IFS models through participatory approach, integrated farming systems for different agro-ecosystems and drudgery and ergonomics in different farming systems.

The practical exposure visits to ICAR-NRRI (Cuttack), ICAR-CHES (Bhubaneswar) and OUAT (Bhubaneswar) were organised for the trainees. Trainees also visited an adopted village of ICAR-CIWA under IFS project.

The course was organized by Dr. Naresh Babu, Dr. B. Sahoo, and Dr. Shivaji Dadabhau Argade, Dr. J. Charles Jeeva, and Dr. Laxmi Priya Sahoo.



(vii) Brainstorming workshop on “Promoting Agricultural Education among Rural Women for Entrepreneurship Development”

A brainstorming workshop on the theme “Promoting Agricultural Education among Rural Women for Entrepreneurship Development” was conducted on 18 March, 2017 at ICAR-Central Institute for Women in Agriculture, Bhubaneswar. Dr. A.K.Panda, gave a brief overview about the workshop's objective. Dr B.N. Sarangi put forth the important human development variables to be considered for developing agriculture entrepreneurship among rural women. Dr. J. Kishtwaria aptly set the tone of the workshop with regard to the curriculum gearing up to prepare future cadres of agriculture and extension personnel for meeting the challenge of reaching out to farm women especially for agri entrepreneurship. Dr. A.K. Panda gave a presentation on the progress of the project followed by group discussion on Agricultural Education for entrepreneurship development for bringing roadmap to gear up the existing curriculum to equip the students to enable the rural women and develop entrepreneurs among them through innovative methods of education. About 40 participants comprising of scientists, agri-educationists, RA, SRFs and post graduate students has participated in the workshop.



Trainings organized under project:

Name of the Project	Programme	Venue	Date	No of Stakeholders
Multi-sectoral Package of Practices for Nutrition and Livelihood Enhancement of Tribal Families	Scientists-Tribal Farm Families Interface and capacity building programme on sunflower as intercrops for additional income generation (TSP)	Village K.M. Bhaliasahi in R. Udayagiri block of Gajapati district	12 January, 2017	60 tribal farm families
	Scientists-Tribal Farm Families Interface and Nutrition education programme (TSP)	Village Tarajodi in Shamakhunta block of Mayurbhanj district	25 January, 2017	50 tribal farm families
	Scientists-Tribal Farm Families Interface and Awareness Programme on Commercial Horticulture (TSP)	Village Tarajodi in Shamakhunta block of Mayurbhanj district	18 February, 2017	50 tribal farm families
Development and testing of institutional innovations for empowering women in agriculture	Celebration of "Jay Kissan Jay Vigyan Days"	ICAR-CIWA, Bhubaneswar	23-25 December, 2016	40 Farm women
	Training-Cum-Demonstration on Oyster mushroom cultivation	ICAR-CIWA, Bhubaneswar	23 December, 2016 and 10 and 20 January, 2017	183 farm women
	Demonstration on garden tools and equipments	20 adopted villages under MGMG program	February, 2017	480 farm women
Empowerment of farm women through livestock technologies	Animal Health Camp and Farmers meet	Alapur Village, Gop Block, Puri District	31 August, 2016	68
	Animal Health Camp	Chamrapada Village, Cuttack Sadar Block	9 December, 2016	73
Promoting gender equity through family poultry production	Awareness on Family Poultry Farming	Alipingala	7 January, 2017	40 farmwomen
	Family poultry for livelihood and nutrition security	Tarajodi	25, January 2017	54 tribal women
	Workshop on Family Poultry Farming	Parichanarpada	4 February, 2017	45 farmwomen
	Workshop on Family Poultry Farming	Badala	25 February, 2017	58 farmwomen
Enhancing income of rural women through improved goat rearing	Stake holder meeting and awareness programme on goat farming	Jirabadi, Bhanjanagar, Ganjam District	15 March, 2017	60
Identification of gender issues in IPM and suitable intervention with women perspective	Bio-intensive IPM model demonstration	Harekrushnapur, Koelpungi, Motari and Talagutha, of Dhenkanal district	October 2016 - March 2017	10
	Scientists Farmers Interface	Luhaba Maliput village, Semiliguda block of Koraput district of Odisha	29 June, 2016	74 farmers/farmwomen
	Scientist -Farmers Interface	Dungri guda village under Bhawani patna block of Kalahandi dist. Odisha	10 August, 2016	60 farmers/ farm women
	Scientist -Farmers Interface	MV-3 village under Malkangiri block of Malkangiri dist. Odisha	27 August, 2016	70 farmers/farmwomen
	Scientist -Farmers Interface	Nalichuan village (Sansad Adarsh Gram) of Bhatli block under Bargarh dist.	29 September, 2016	90 farmers/farmwomen
	Scientist -Farmers Interface	Khatangakudar village of Bisra block under Sundargarh dist	1 October, 2016	70 farmers/farmwomen
	Scientist -Farmers Interface	Katadaganda village under block G. Udaygiri of Kandhamal dist. Odisha	29 November, 2016	60 farmwomen/ farmers

Collaborative project on Integrated farming system for improvement of nutrition and livelihood of farm women under different agro-ecosystems	Capacity development / Skill development programme for the vaccination of chicks with Lassota	Sankharidiha and Dakhinisasan village of Dharamsala block of Jajpur district in Odisha	16 May, 2016	50 farmwomen/ farmers
	Capacity development / Skill development programme for the vaccination of chicks with IBD (Infectious Bursal Disease)	Sankharidiha and Dakhinisasan village of Dharamsala block of Jajpur district in Odisha	27 May, 2016	50 farmwomen/ farmers
	FLD on Improved Retting Techniques of Jute with CRUIAF Sona	Sankharidiha and Dakhinisasan village of Dharamsala block of Jajpur district in Odisha	4 October 2016	50 farmers/farm women
	Demonstration on Installation of Terafill Water Filter	Sankharidiha village of Jajpur district	27 March, 2017	20 farm families
	Demonstration of Smokeless Chulha	Sankharidiha village of Jajpur district	29 March, 2017	50 farmers/farm women/ children and adolescent girls
Exploratory study on nutritional status of Nabarangpur district Odisha	Scientist -Farmers Interface	Sukhigan village under Umerikot block of Nabarangpur dist. of Odisha	12 August, 2016	Eighty five farmers and forty farmwomen
	Scientist -Farmers Interface	Birigodou village under Umerikot block of Nabarangpur dist. of Odisha	12 August, 2016	Fifty farmers and twenty farmwomen
	Scientist -Farmers Interface	Pandara pakhana village under Raighar block of Nabarangpur dist. of Odisha	12 August, 2016	Thirty four farmers and twelve farmwomen
Collaborative Project Livelihood and Nutritional Improvement of Tribal Farmwomen through Horticulture	Scientist Farmers interface	Kamaninga and Majishai of Dhenkanal	8 June, 2016	30 tribal farm families
	Scientist Farmers interface	Kamaninga and Majishai of Dhenkanal district	23 June, 2016	30 tribal farm families
	Review Workshop	ICAR CIWA, Bhubaneswar	24 September, 2016	
	Seed Production of vegetables	Village Kamaninga of Dhenkanal District	29 September, 2016	25 farm women
Promoting Agricultural Education among Rural Women for Entrepreneurship Development	Entrepreneurship development among rural women through agriculture	Alipingala	07 January 2017	105
	Entrepreneurship development among rural women through agriculture	Parichanrapada	04 February 2017	69
	Family poultry for livelihood and nutrition security	Tarajodi	25 January 2017	54
	Promoting agricultural education among rural women for entrepreneurship development	ICAR-CIWA, Bhubaneswar	15 March 2017	40
Assessment of integrated farming models for improved food security and livelihood in rural household	Swachh Bharat Abhiyan	Bhadrapur	20 October, 2016	35
	Scientists - farmer's Interface	Jhadeswarpur	18 March, 2017	50
Ergonomic evaluation of selected manually operated farm equipments in mango and cashew nut	Use of improved harvester for drudgery reduction farm women in the orchards	Art of Organic and Chandak Nursery, Biradia, Dhenkanal	6 June, 2016	35 Farm women & men

Trainings / workshops organized

SI No	Programme	Venue	Date	Organizers	No of Stakeholders
1.	Brainstorming workshop on Bridging the gaps in Gender Research	ICAR-CIWA, Bhubaneswar	1-2 June, 2016	J. Kishtwaria	64
2.	Training on Gender sensitization for engendering agricultural research and extension	BAU, Sabour, Bihar	23-25 August, 2016	J. Kishtwaria Sabita Mishra H.K. Dasj A.K.Panda Jyoti Nayak G. Moharana	40 KVK SMS, Home Science
3.	National Workshop on Mitigating Drudgery of Farmwomen in collaboration with Watershed Mission, Odisha	ICAR-CIWA, Bhubaneswar	15-16 September, 2016	Jyoti Nayak, G. Moharana, Chaitrali S. Mhatre	50/36
4.	Review Workshop of the Collaborative Project Livelihood and Nutritional Improvement of Tribal Farmwomen through Horticulture	ICAR CIWA, Bhubaneswar.	24 September, 2016	Naresh Babu, J. C. Jeeva L. P. Sahoo	10
5.	Workshop on "Gender Responsive Budgeting" with collaboration of NIFM, Haryana	ICAR-CIWA, Bhubaneswar	5-6 October, 2016	Sabita Mishra A. Sarkar L.P. Sahoo G. Moharana Shivaji D. Argade	45 participants from ICAR-CIWA
6.	Model Training Course on "Promoting Occupational Safety and Drudgery Reduction among Farm Women"	ICAR-CIWA, Bhubaneswar	3-10, November, 2016	Jyoti Nayak Abha Singh G. Moharana	13
7.	Training-cum-Workshop of Scientists of ICAR-CIWA and AICRP on Home Science	ICAR-CIWA, Bhubaneswar	15-16, November, 2016	Jyoti Nayak Abha Singh G. Moharana	22
8.	Workshop on review of collaborative project: "Empowerment of farm women through livestock technologies"	ICAR-CIWA, Bhubaneswar	17 November, 2016	Anil Kumar, B. Sahoo, Tanuja, S.	15

9.	Short Course on "Empowerment of Farm Women through Livestock and Poultry Interventions	ICAR-CIWA Bhubaneswar	21-30 November, 2016	A.K. Panda Anil Kumar, B. Sahoo, Tanuja, S.	18 scientists of ICAR/SAUs
10.	Training-cum-Workshop of Scientists of ICAR-CIWA and AICRP on Home Science	ICAR-CIWA Bhubaneswar	26-27 November, 2016	Jyoti Nayak Abha Singh G. Moharana	25
11.	Short Course on "Integrated Farming System: An Approach towards Livelihood Improvement of Farm Women and Natural Resource Conservation"	ICAR-CIWA Bhubaneswar	14-23 December, 2016	Naresh Babu B. Sahoo Shivaji D. Argade L.P. Sahoo Charles Jeeva	12 scientists of ICAR/SAUs
12.	Organized a Media Meet Workshop on Reaching Farm Women through Media	ICAR-CIWA Bhubaneswar	4 January, 2017	Sabita Mishra A. Sarkar L.P. Sahoo G. Moharana Shivaji D. Argade	17 media Personnels
13.	Workshop cum Training of Training (ToT) on Provision of Gender Friendly farm tools for Farm Women in Watershed Areas	ICAR-CIWA Bhubaneswar	9-10, January, 2017	Jyoti Nayak, G. Moharana, Chaitrali S. Mhatre	22
14.	Model Training on "Strengthening Farm Women Perspective in Quality Seed Production"	ICAR- CIWA, Bhubaneswar	11-18 January, 2017	L. P. Sahoo Tanuja S. Shivaji D. Argade	21
15.	Joint Seminar of Scientist in Hindi on " The role of scientific and technical institutes in economic independence", in joint collaboration with Seven Institution of different Ministries of Govt of India	Insitute of Physics Bhubaneswar	27 February, 2017	S.K.Srivastava,	105
16.	Bainstorming workshop on "Promoting Agricultural Education among Rural Women for Entrepreneurship Development	ICAR-CIWA Bhubaneswar.	18 March, 2017	A. K. Panda	40 Participants scientists, Agri-educationists, RA, SRFs, P.G. Students

Exhibition organized during different occasions

Sl no	Title	Venue	Date	Organizers
1.	Exhibition stall during 70 th Foundation Day of ICAR-NRRI.	ICAR-NRRI, Cuttak, Odisha	23 April, 2016	S. K. Srivastava, Chaitrali S. Mhatre and Sujit Kumar Nayak
2.	Exhibition stall during Akshaya Tritiya and Farmers Fair	ICAR-NRRI, Cuttak, Odisha	09 May, 2016	Anil Kumar, Geeta Saha and Pragati Kishore Rout
3.	Exhibition during Brainstorming Workshop	ICAR-CIWA, Bhubaneswar, Odisha	1-2 June, 2016	Sabita Mishra
4.	Exhibition stall during 23 rd Zonal Workshop of KVKs	ICAR-CIFA, Odisha	03 Sept, 2016	Naresh Babu, Manoranjan Prusty and Sujit Kumar Nayak,
5.	Exhibition during Drudgery Workshop	ICAR-CIWA, Bhubaneswar, Odisha	15-16 September, 2016	Sabita Mishra
6.	Exhibition Stall during celebration of WORLD FOOD DAY function organized by Orissa Krushak Samaj	Institute of Engineers, Bhubaneswar, Odisha	16 October, 2016	H. K. Dash, B. C. Sahu and Sujit Kumar Nayak
7.	Exhibition stall during National Seminar on "Aquaculture diversification: the way towards blue revolution" organised by ICAR-CIFA	ICAR-CIFA, Odisha	1- 3 December, 2016	Tanuja S., B. C. Behera and P.K.Rout
8.	Exhibition stall during Media Meet Workshop	ICAR-CIWA, Bhubaneswar, Odisha	04 January, 2017	Sabita Mishra
9.	Exhibition stall during National Seminar on "Priorities in Fisheries and Aquaculture" organised by ICAR-CIFRI, Barrackpore	College of Fisheries, Rangeilunda, Odisha	11- 12 March, 2017	Tanuja S., P.K.Rout and S.K.Behera
10.	Exhibition stall at <i>Krishi Unnati Mela</i> , 2017	ICAR-IARI, New Delhi	15-17 March, 2017	Laxmipriya Sahoo, Manoranjan Prusty and Subrat Kumar Das
11.	Exhibition stall during State Level Krushi Mahotasav	Biju Pattnaik Play Ground, Bhubaneswar, Odisha	28-31 March, 2017	J. Charles Jeeva, B. C. Behera and B. C. Sahoo

11. Training / Workshop/ Exhibition organized under AICRP on Home Science

Sl. No.	Title	Venue	Date	No. of beneficiaries
1.	Extension for farm women empowerment through sharing agriculture information and entrepreneurial development	Nagireddyguda	April- October,2016	20 farm women
2.	Innovative incomes through integrated farming systems and sustainable agriculture	Nagireddyguda Tholkatta,Bakaram,E aithbarpally	April- October,2016	158 SHG members, farm women, youth
3.	User friendly storage practices & importance of vermicompost	Jyolicot & Bhilwara, Udaipur	15 April,2016	42 NGOs members, farmwomen
4.	Iron rich foods	Karanga Girls' H.S. School, Jorhat Subarnaprabha Bordoloi Girls' H. S. School	5-6 April, 2016	310 adolescent girls
5.	Value added amla products	HSC&RI, Madurai	April 27,2016 September 29, 2016	43 SHG members, farm women
6.	Health and hygiene to prevent diseases	Karanga Girls' H.S. School, Jorhat Subarnaprabha Bordoloi Girls' H. S. School, Dhekiajuli	7 & 8 April, 2016	308 adolescent girls
7.	Five food groups and balance diet	Karanga Girls' H.S. School & Subarnaprabha Bordoloi Girls' H. S. School, Jorhat	18 & 19 April, 2016	220 adolescent girls
8.	Soft toy making	Perumalpatti, Kondayampatti and Ottupatti	4-6 April, 2016 14-15 October,2016	55 farm women
9.	How to overcome stress	Devan	6 April,2016	22 dropout girls
10.	Capacity Building of SHG members for upscaling of Green Manure for promotion of entrepreneurship for SHGs	Tholkatta & Nagireddyguda village	10-25 April, 2016	15 SHG members
11.	Importance of agriculture technology management Agency in entrepreneurial development for youth	Dharmapuri & Takli	13 April, 2016	70 youths
12.	Behavioural changes in adolescents & Preschool management	KVK Sagroli, Nanded	22 April, 2016	80 school hostels Rectors and preschool teachers

Sl. No.	Title	Venue	Date	No. of beneficiaries
13.	Technology transfer for empowerment of rural women	Vikas Bhavan, Udham Singh Nagar	27 April, 2016	30 Extension staff
14.	Value added products from moringa	EDP Centre, HSC&RI, Madurai	28 April, 2016	17 SHG members
15.	Oral hygiene	Bhilwara	30 April, 2016	21 Farm Women
16.	Beauty care	Counseling Center, Vandvihar village & Anganwadi centre Ghuggar, Palampur	2 May – 1 Aug, 2016 27 June -26 July, 2016	30 adolescent girls and young women
17.	Ready to eat products from moringa leaves powder	HSC&RI	3 May, 2016	5 farm women
18.	Making envelopes from old invitation cards and newspaper	Buksora	13 May, 2016	8 adolescent girls (school dropouts)
19.	Motivating SHG members to take up entrepreneurial activities	Dharwad	17 May, 2016	23 Anganwadi teachers
20.	Embroidery	Melachinnapatti	17-19 May, 2016	25
21.	Use of solar cooker at household level	Talwandi Khurd	20 May, 2016	16 farm women
22.	Training programme on Preparation of Mat Nursery	Na-Nai Khongia Gaon.	25 May, 2016	15 farm women
23.	Preparation of paper bags	Talwandi Khurd	26 May, 2016	16 farm women
24.	Different recipes made on solar cooker and Preparation of paper bags	Talwandi-Khurd & Lakhawal	27 May, 2016 10 June, 2016 1 July, 2016	86 farm women
25.	Role of home environment in personality development	Devan	28 May, 2016	25 mothers of school dropout girls
26.	How to overcome exam fear	Bharrowal	31 May, 2016	34 farm women
27.	Nutritious foods for small children	Challi	June, 2016	25 Rural women
28.	Personal and environmental hygiene	Devan	13 June, 2016	25 dropout girls
29.	Benefits of Neem	Talwandi	1 June, 2016	50 Farm women
30.	Formation of self help groups	Talwandi	1 June, 2016	50 Farm women
31.	Livelihood interventions and Income generating activities – Non-farm enterprises	Nagireddiguda, Bakaram, Tholkatta, Eaithbarpally, operational villages of Moinabad Block	2 June, 2016 4-5 & 27-28 June, 2016 2 August, 2016 2 September, 2016	85 Farm women
32.	Effective functioning of Self Help Group	Maulichack, Panchrukhi block, Distt. Kangra	3 June, 2016	18 Farm women
33.	Fuel conservation by the use of solar cooker	Talwandi Khurd	3 June, 2016	12 farm women

Sl. No.	Title	Venue	Date	No. of beneficiaries
34.	Sapling transplanter and other drudgery reducing technologies	PJTSAU, Hyderabad	4 June, 2016	13 farm women
35.	Safe drinking water for good health	Devargudihal	8 June, 2016	25 Rural women and girls
36.	Method of drying chillies, haldi and garlic in solar dryer	Talwandi-Khurd	9 June, 2016	21 farm women
37.	Personal hygiene in school children	Dumwad	11 June, 2016	250 Students
38.	Effective functioning of Self Help Groups and Vermicompost – its importance & uses	G Basavankoppa	13 June, 2016	Farm women 30
39.	Utilization of underutilized textile material for bag making	Devan	13-15 June, 2016	22 farm women
40.	Intervention Programme on Mat nursery	Handique Gaon	15 June, 2016	20 farm women
41.	Preservation of seasonal fruits and vegetables	Talwandi Khurd	15 June, 2016	12 farm women
42.	Value addition of millets and fruits and vegetables	Sampakkulam and Ottupatti	14-15, June 2016	30 farm women
43.	Value addition to soybean at home scale	Maulichack, Panchrukhi block, Kangra	16-17 June, 2016	5 Women of SHG
44.	Empowerment of value added product through eco-friendly technology		20-25 June, 2016	28 farm women
45.	Machinery for skill based training program on customized clothing	Tolukatta	24 June, 2016	18 farm women
46.	Preparation of nutritious snacks	PAU, Ludhiana	26 & 27 June, 2016 5 November, 2015	103 farm women
47.	Effective functioning of Self Help Groups and Importance of Minor Millets	Devragudihal	30 June, 2016	Farm women 35
48.	Gender concerns in agriculture and allied sectors	EEl	30 June, 2016	25 Extension Personnel of Line Departments viz. DRDA, Agriculture, Animal Husbandry, Fisheries
49.	Formulation and preparation of green manure through micro enterprise green enterprise 'Orientation and Introduction on Green Manure for promotion of entrepreneurship'	Tholkatta	June – October, 2016	45 SHG members & farm women.

Sl. No.	Title	Venue	Date	No. of beneficiaries
50.	Milk processing	Kondayampatti	1-3 July, 2016	10 farm women
51.	Establishing resource centre for customized clothing	Tolukatta	July 5, 2016	45 farm women
52.	Entrepreneurship through beauty culture	Manpura	12 July, 2016	35 women
53.	Capacity building on livelihood Security of farm women		13 & 23 July, 2016	25 farm women
54.	Value added products from mango	HSC&RI	15 June, 2016	7 farm women
55.	Vermicompost training	Sembukudi patti, Paniyali and Sarialtal	11-13 July, 2016 7,9, 14, 16 & 21 September, 2016 and 26 October ,2016	62 rural women and adolescent girls
56.	Mental preparation for new academic year courses and adjustment with higher class	Daithana	14 July, 2016 16 July, 2016	100 academically backward school students
57.	Use and maintenance of drudgery reducing technologies	Dogda	14 & 17 June, 2016	35 farm women
58.	Vermiculture	Manpura	12 July, 2016	20 Farm Women
59.	Embroidery stitches under Skill India programme	Shri. Sarang Swami Vidyalaya Parbhani	15-16 July, 2016	68 Students
60.	Tie and Dye	Students of Govt. High School, CCSHAU, Hisar	15-16 July, 2016	48 farm women
61.	Importance of various free of cost vocational training	Daithana	16 July, 2016	50 rural youth and their parents
62.	Screening of the participants for customized clothing training programme.	Tolukatta	16 July	15 farm women
63.	Value added products from Papaya	HSC&RI	16 July	7 farm women
64.	Orientation training of financial assistances	Maanpura	18 July, 2016	19 Rural women
65.	Management of ailments	Karion Kisan Ghar	19 July, 2016	5 farm women
66.	Capacity building and livelihood security for farm and i.g. activity on soap powder making		19 July, 2016	16 farm women
67.	Drudgery reduction in dairy enterprise	Dogda	20 & 22 July, 2016	30 farm women
68.	Orientation for skill based training program on customized clothing	Tolukatta	20 July, 2016	35 farm women
69.	Balanced diet	Tholkatta, Bakaram,	21 July, 2016	187 adolescent girls

Sl. No.	Title	Venue	Date	No. of beneficiaries
		Nagireddyguda, Hyderabad		
70.	Marketing strategies for Tofu to women of 'Om Sai Ram' Self Help Group and motivation camp to upscaled Self Help Group 'Ujala' – to start an income generating activity	Maulichack, of Panchrukhi block, Kangra	21 July, 2016	10 Women of 'Om Sai Ram' & Ujala' Self Help Group
71.	Care and maintenance of machine parts, hand stitching techniques (skill based training program on customized clothing)	Tolukatta	22 July, 2016	25 Farm women
72.	Drudgery reducing technologies i.e., ring cutters, plier cutters, finger guards	Tholkatta village	22 & 26 July, 2016	35 farm women
73.	Jewellery making	Bhilwara & Manpura	25-26 July, 2016 27-30 July, 2016 27- 8 July & August, 2016	49 Rural women
74.	Machine peddling, handling of machine, practicing basic hand stitches (skill based training program on customized clothing)	Tolukatta	26 July, 2016	25 farm women
75.	Stitching on fabric	Tolukatta	27 July, 2016	25 farm women
76.	Basic tailoring	Kondayampatti	28-30 July, 2016	10-15
77.	Preparation of complementary foods using locally available ingredients, importance of breast feeding and importance of five food groups and balance diet	Sonari, Karangakhat, Buruk Baruah, Na-Noi Khangia, Handique	1-5 August, 2016	187 Rural women
78.	Gender mainstreaming	Sameti, EEI	03 August, 2016 16 August, 2016 27 August, 2016	90 Agriculture officers of Telangana States
79.	Women empowerment	SAMETI	03 August, 2016	25 Agriculture officers
80.	Drafting of Jhangia pattern making and sample preparation with hand sewing (skill based training program on customized clothing)	Tolukatta	03 August, 2016	25 farm women
81.	Drudgery reducing technologies	Tholkatta	05, 17 & 26 August, 2016	114 farm women
82.	Rakhi making	Nora & Lakhawali	5 August, 2015	35 women

Sl. No.	Title	Venue	Date	No. of beneficiaries
		Udaipur	9-11 August, 2016	
83.	Ideas for developing successful SHG's	Bgudihal	6 August, 2016	35 SHG members
84.	Leadership building & group dynamics : Healthy families and healthy communities- Role of government personnel	DRDA office, Nalgonda	9 August, 2016	20 APMs, CCS of DRDA & Extension officers.
85.	Counseling on free of cost vocational training	Daithana	10 August, 2016	50 rural youth and parents
86.	Leadership building & group dynamics group dynamics – Pancha Soothralu for strengthening SHGs	Nagireddypalli	10 August, 2016	15 SHG leaders
87.	Jhangia stitching with machine and drafting of saree petticoat	Tolukatta	10 August, 2016	22 farm women
88.	Cutting and stitching of actual size saree petticoat	Tolukatta	11 August, 2016	20 farm women
89.	Importance of certificate trainings for entrepreneur development and procedure for enrollment for various vocational training	Daithana	12 August, 2016	Rural youth & their parents and all Gram Panchayat
90.	Drafting of basic bodice and developing shimmy from basic bodice	Tolukatta	17 August, 2016	40 farm women
91.	Glass painting	Talwandi-Khurd	18 August, 2016	16 farm women
92.	Candle making	Lakhowal	19 August, 2016	23 farm women
93.	Entrepreneurship development	Takli (K)village, Dist. Parbhani	19-20 August, 2016	40 Farm women
94.	Hand embroidery stitches and construction of functional clothing	Netajinagar, U.S.Nagar	19- 21 August, 2016	8 farm women
95.	Improved animal husbandry practices	Paniyali	19 & 24 August, 2016	26, rural men women and youth
96.	Role of home environment in improving behavior problems	Devan	20 August, 2016	30 parents of school dropout girls
97.	Drudgery reducing technologies	Takli (K)village, Parbhani	20 August, 2016	22 Farm women
98.	Health and sanitation campaign	Devan	24 August, 2016	16 farm women
99.	Making cotton picking apron and soybean mitten	Shahapur Tq. Degalur, KVK Sagaroli, Nanded	25- 26 August, 2016	30 female entrepreneurs

Sl. No.	Title	Venue	Date	No. of beneficiaries
100.	Drudgery reducing farm implements	Talwandi-Khurd	26 August, 2016	21 farm women
101.	Value added products from Banana	HSC&RI	30 August, 2016	4 farm women
102.	Mushroom training	Melacinnampatti	30-31 August, 2016	25 farm women
103.	Habit formation in adolescents	Talwandi-Khurd	31 August, 2016	26 farm women
104.	Health and hygiene	Bandvihar, Hisar Bhilwara, Udaipur Anganwadi, Ghuggar	6 July, 2016	85 farm women
105.	How to overcome academic anxiety	Raawal	1 September, 2016	23 farm women
106.	Videography	College of Home Science VNMKV, Parbhani	1-3 September, 2016	18 students
107.	Importance of SHG & its activities and nashamukti	Manpura	6 September, 2016	11 Farm Women
108.	Drudgery reducing technologies i.e., seed drill	Tholkatta	8 September, 2016	20 farm women
109.	Drafting of chudidhar and pyjama	Tolukatta	8 September, 2016	20 farm women
110.	Capacity building of SHG	AAU, Jorhat	8-9 September, 2016	25 SHG functionaries
111.	Use of hand held sapling transplanter	Malerkotla	8-9 September, 2016	40 farm women
112.	Integrated farming methods for sustainable agriculture	Bakaram	10 September, 2016	15 farm women
113.	Embroidery training	Melacinnampatti and Ayyanakavundampatti	12-14 September, 2016	30 farm women
114.	Soft toy making and Construction of functional clothing	Anganbadi centre, Village Buksaura U.S.Nagar distt.	12-14 September, 2016	17 farm women
115.	Diet and nutrition for adolescent girls	GGIC Gadarpur	14 September, 2016	15 School teachers
116.	Technological empowerment of farm women	AAU, Jorhat	14-15 September, 2016	30 Farm women
117.	Pearl mala making	Manpura	15 September, 2016	12 farm women, girls
118.	Preparation of apple chutney and mixed fruit jam	Talwandi Khurd	15 September, 2016	13 farm women
119.	Drudgery reducing technologies i.e., brush cutter	Tholkatta village	16 September, 2016 3 October, 2016	40 farm women
120.	Iron deficiency among adolescent girls and its cure	GGIC, Kicha	16 September, 2016	16 School teachers
121.	Saree blouse	Tolukatta	16 September, 2016	20 farm women

Sl. No.	Title	Venue	Date	No. of beneficiaries
122.	Enhancing health, development and contribution of rural women and children	College of Home Science, VNMKV, Parbhani	20 to 22 September, 2016	27-KVK Home Scientist and Programme Coordinator
123.	Preparation of various recipes on seasonal fruits and vegetables	Tanda	26-30 September, 2016	17 farm women
124.	Development of protective okra, brinjal and soybean harvesting mittens	KVK Kharpudi, Jalna	27 September, 2016	10 female entrepreneurs
125.	SHG- inter loaning process	Bhilwara and lakhawali	27 September, 2016 18 October, 2016	26 Farm Women
126.	Piping and patch making for necklines and design details	Tolukatta	29September, 2016	15 farm women
127.	Preservation	Sonari, Karangakhat, Buruk Baruah, Na-Noi Khangia, Handique Gaon	3-7 October, 2016	122 Rural women
128.	Drudgery reducing tools and techniques	Handique Gaon	4-5 October, 2016	35nos. farm women
129.	Snacks suitable during fasting	Manpura	5-6 October, 2016	44 Rural women
130.	Health, hygiene and sanitation	Kondayampatti Bhilwara, Rajasthan	6 October, 2016	31 farm women
131.	Menstruation hygiene	Bhilwada	6 October, 2016	25 Adolescent girls and rural ladies
132.	Orientation and introduction : Green manure for promotion of organic farming	Nagireddyguda	6 October, 2016	25 SHG leaders and farmers
133.	Sanitation and health	Dogda	7 & 14 October, 2016	50 farm women
134.	Block printing with Cassia Tora Seed Gum	AICRP – Lab	14-17 October, 2016	20 farm women
135.	Dry flower arrangement	HSC&RI, Madurai	17 & 18 October, 2016	20 farm women
136.	Life skills	Lakhawali	17 October, 2016	17 adolescents girls and rural ladies
137.	<i>Self awareness</i>	<i>Dangio ka Guda Lakhawali, Udaipur</i>	<i>18 October, 2016</i>	<i>57 Adolescents girls and rural ladies</i>
138.	Basic sleeve drafting and developing cap sleeve pattern from basic pattern	Tolukatta	18 October, 2016	16 girls
139.	Entrepreneurship development for SHGs.	Narsingh	19 October, 2016	40 SHG members
140.	Decision making	Lakhawali	19 October, 2016	15 adolescent girls and rural ladies
141.	Communication skills	Lakhawali	20 October, 2016	12 Adolescent girls and rural ladies
142.	Ergonomic method of household cleaning	Malerkotla	21 October, 2016	20 farm women

Sl. No.	Title	Venue	Date	No. of beneficiaries
143.	Screen printing with Cassia Tora Seed Gum	AICRP - Lab	21-22 October, 2016	20 farm women
144.	Value addition to mushrooms	Village Raowal	24-25 October, 2016	30 farm women
145.	Dengu – Symptoms, prevention and control	Dogra	26 October, 2016	28, rural men women and youth
146.	Tips for cleanliness of kitchen appliances	Talwandi Khurd	26 October, 2016	22 farm women
147.	Floriculture	Dogra & Paniyali	26-27 October, 2016	40, rural men women and youth
148.	Harmful effect of using plastic	Dogra	27 October, 2016	32 rural men women and youth
149.	Effective vegetable cultivation	Dogra & Paniyali	26 October, 2016 & 8 November, 2016	42 rural men, women and youth
150.	Livelihoods and rural enterprise : Nonfarm enterprises-marketing linkages	Tholkatta Bakaram	3 November, 2016; 7 November, 2016	50 SHG leaders and book keepers
151.	Umbrella and bell cut for frocks, anarkali dresses and sleeves patterns	Tolukatta	3 November, 2016	20 farm women
152.	Block printing with Mango kernel starch	AICRP – Lab	4-5 November, 2016	20 farm women
153.	Imparting knowledge on use of mobiles and computer	Paiyali	9 November, 2016	20, rural women and adolescent girls
154.	Fabric embellishment through tie and dye, block and stencil printing and embellishment materials	Students of Govt. High School, CCSHAU, Hisar	9-11 November, 2016	56 farm women
155.	Bee keeping	Dogra, Paniyali	9 & 11 November, 2016	90 rural men women and youth
156.	Screen printing with Mango kernel starch	AICRP - Lab	15-16 November, 2016	20 farm women
157.	Drudgery reducing technologies i.e., brush cutter	Tholkatta, Moinabad mandal	17 November, 2016	16 farm women
158.	Different puff sleeve variations	Tolukatta	17 November, 2016	10 farm women
159.	Income generating activities	Bains	30 November, 2016	50 farm women

EDUCATIONAL MATERIAL DEVELOPED

I. Technical Bulletins/ Manuals

Padma, A. And Shaik, K. S. 2016. Module on Designer Blouses. Ramdigi Press, Hyderabad.

Singh, R. and Agrawal, N. 2016. Educational package on vocational education.

Singh, R. and Agrawal, N. 2016. Training module on Child care.

STRENGTHENING, MONITORING & EVALUATION OF ALL INDIA COORDINATED RESEARCH PROJECT (AICRP) ON HOME SCIENCE

1. Participated in Review Meeting of AICRP on Home Science & discussed ongoing projects of AICRP along with Unit & Technical Coordinator of five components, ICAR, New Delhi, 19-20 February, 2016.
2. Conducted & participated in Review Meeting of AICRP on Home Science, PAU, Ludhiana, 21-22 March, 2016.
3. **Organized Unit meeting of AICRP on Home Science at NASC Complex, New Delhi, ICAR, New Delhi, 28th -29th April, 2016 for two components of AICRP on Home Science.**
4. Participated in Unit meeting of Food and Nutrition Component of AICRP on Home Science and scientists from ten centres were attended and discussed planning of Biennial Conference, AAU, Jorhat, 20th May, 2016.
5. Organized Brainstorming workshop of AICRP on Home Science at ICAR-CIWA, Bhubaneswar from 2-3 June, 2016 to discuss the ongoing projects and plan of future projects.
6. Participated in Unit meeting of Human Development & Family Studies component of AICRP on Home Science at ICAR, New Delhi, 2nd – 3rd August, 2016 and scientists were called to finalize the proposed projects for 2017 onwards.
7. Conducted Workshop on Mitigating drudgery of farmwomen adoption of gender friendly technologies from 15th – 16th September, 2016 at ICAR-CIWA. The scientists from AICRP on Home Science were invited as experts and also finalized proposed projects of AICRP.
8. Organized Sub-committee Meeting for formulation of new project proposals for 2017-2020 of Foods & Nutrition component from 3-5 October, 2016 at UAS, Bengaluru. Experts in concerned field at national level attended to give their suggestions in formulation of the future projects.
9. Organized Sub-committee Meeting for formulation of new project proposals for 2017-2020 of Human Development & Family Studies component & Family Resource management component on 13th & 14th October, 2016 at PJTSAU, Hyderabad. Experts in concerned field at national level attended to give their suggestions in formulation of the future projects.
10. Organized Sub-committee Meeting for formulation of new project proposals for 2017-2020 of Clothing & Textile component on 13th & 14th October, 2016 at GBPUA&T, Pantnagar. Experts in concerned field at national level attended to give their suggestions in formulation of the future projects.
11. Organized Sub-committee Meeting for formulation of new project proposals for 2017-2020 of Home Science Extension & Communication Management component on 2nd & 3rd November, 2016 at NASC Complex, ICAR, New Delhi. Experts in concerned field at national level attended to give their suggestions in formulation of the future projects.
12. Conducted Training-cum-Workshop of Food & Nutrition component of AICRP on Home Science at ICAR-CIWA, Bhubaneswar, 15-16 November, 2016 and scientists from ten centres attended. Experts in concerned field at national level attended to give their inputs for the future project venture.
13. Conducted Training-cum-Workshop on Gender Concern in Agriculture of AICRP on Home Science of at ICAR-CIWA, Bhubaneswar on 26th & 27th November, 2016 and scientists of four components from ten centres attended. Experts in concerned field at national level attended to give their inputs for the future project venture.
14. Reports/ information pertaining to AICRP on Home Science research work and achievements submitted to Headquarters time-to-time.

Participation in Training / Workshop / Conferences etc.

Sl no.	Title	Venue	Date	Attended by
1.	Orientation training	ICAR-CIWA, Bhubaneswar	8 April - 19 May, 2016	Ankita Sahoo
2.	Protection and Registration on GI of goods (workshop)	Odisha Bigyan Academy, Bhubaneswar	23 April, 2016	A.K. Panda
3.	Institute Joint Council Meeting	ICAR-CIWA	26 April, 2016	L.P Sahoo
4.	Interaction meeting with Research Organizations on Agriculture Technology Development	IMAGE, Bhubaneswar	29 April, 2016	A.K. Panda
5.	2nd Executive committee meeting of Odisha Horticulture development society	Rajib Bhawan	30 April, 2016	L.P Sahoo
6.	Professional attachment training	ICAR-IIHR Central Horticulture Experiment Station, Bhubaneswar	20 May - 19 August 2016	Ankita Sahoo
7.	Rural Advisory Committee (RAC) Meeting	Door Darshan Kendra, Bhubaneswar	25 May, 2016	Dr. Sabita Mishra
8.	Brainstorming Workshop on bridging the gaps in Gender Research	ICAR-CIWA, Bhubaneswar	1-2 June, 2106	All Scientist
9.	Rural Program Subject Committee (RPSC) Meeting	All India Radio, Cuttack	13 June, 2016	Dr. Sabita Mishra
10.	Institute Research Committee (IRC) Meeting	ICAR-CIWA, Bhubaneswar	22-23 July, 2016	Dr. Sabita Mishra
11.	Interaction meeting with Research Organizations on Agriculture Technology Development	IMAGE, Bhubaneswar	29 th July, 2016	Tanuja S
12.	Seminar on 'Recent trends in Agricultural Research Capacity, Investment and Outputs in India' organized by IFPRI and ICAR-NAARM (International)	NASC Complex, New Delhi	17 August, 2016	Dr. Ananta Sarkar
13.	Attended the capacity building programme for scientist of KVKs & different colleges for women empowerment and gender mainstreaming	SAU, Sabour	23-25 August, 2016	Jyoti Nayak
14.	Coconut World Day held	KIIT University, Bhubaneswar	2 September, 2016	Naresh Babu
15.	23rd zonal workshop of KVK	CIFA, Bhubaneswar	3 September, 2016	Naresh Babu
16.	A Newton - Bhabha Fund Workshop for "Female leaders in science"	Clare college, Cambridge, U.K.	4 - 10 September, 2016	Abha Singh
17.	<i>Hindi Pakhawada</i>	ICAR-CIWA, Bhubaneswar	12 - 26 September, 2016	All staff of ICAR-CIWA
18.	Workshop on "Mitigating Drudgery of Farm Women: Adoption of Gender Friendly Technologies"	ICAR-CIWA, Bhubaneswar	15-16 September, 2016	All Scientist

19.	Rural Programme Subject Matter Training of All India Radio, Cuttack	AIR, Cuttack	16 September, 2016	L.P Sahoo
20.	Training programme on Developing Winning Research Proposals in Agricultural Research	ICAR-NAARM, Hyderabad	20 to 24 September, 2016	Biswanath sahu
21.	Workshop on Gender Responsive Budgeting conducted by National Institute of Financial Management, Faridabad	ICAR-CIWA	5-6 October, 2016	All scientists
22.	National Meet of Entomologists – 2016	Karnataka Veterinary Council Bengaluru	7-8 October, 2016	S.K.Srivastava
23.	III AAHP Convention and National Symposium on "Poultry Health and Welfare: Riding the wave to the future at	ICCAR, Goa	20-21 October, 2016	A.K. Panda
24.	Attended the training course on Women's Leadership for Impact organized by International Rice Research Institute.	ICAR-CIWA, Bhubaneswar	21-27 October, 2016	Jyoti Nayak
25.	Review meeting of RKVY projects	Conference hall of IMAGE, Bhubaneswar	22 October, 2016	Gayatri Moharana
26.	Training on Seed Programme on Access to seeds-Building capacities, Discussing policies.	ISID, New Delhi	24-28 October, 2016	L.P Sahoo
27.	Vigilance Awareness Week Theme on "Public Participation in Promoting Integrity and eradicating Corruption		31 October - 5 November, 2016	All scientist
28.	State Level Project Screening Committee meeting under RKVY	Conference Hall, Rajiv Bhawan, Bhubaneswar	2 November, 2016	Gayatri Moharana
29.	XXXIII Annual Conference of Indian Poultry Science Association and National Symposium	AAU, Khanapara	3-5 November, 2016	A.K. Panda
30.	Workshop on 'Geo Tagging' (RKVY)	IMAGE, Bhubaneswar	08 November, 2016	Ananta Sarkar Shaji, A.
31.	Workshop cum training on "Trends in Gender Research"	ICAR-CIWA	15-16 November 2016	All scientists
32.	70 th ISAS Annual International Conference on "Statistics & Big Data Bioinformatics in Agricultural Research" organized by International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	ICRISAT, Patancheru	21-23 November, 2016	Ananta Sarkar
33.	ICAR Sponsored Short Course on "Empowering Farm Women Through Livestock and Poultry Interventions"	ICAR-CIWA, Bhubaneswar	21-30 November, 2016	Chaitrali Mhatre, Shivaji Argade
34.	3 rd Executive Committee meeting of MIDH (NHM)	Agriculture Department at Rajiv Bhawan	24 November, 2016	Naresh Babu

35.	3rd Consultative Meet of Regional Advisory Group meeting (RAG) for Farms, Farmers and Rural areas of NABARD	NABARD office Bhubaneswar	25 November, 2016	L.P Sahoo
36.	Interaction meeting with Research Organizations working closely for Agriculture Technology Development for the month of November 2016	IMAGE, Bhubaneswar	25 November, 2016	L.P Sahoo
37.	Workshop cum training on "Trends in Gender Research"	ICAR-CIWA	26-27 November 2016	All scientists
38.	Workshop on " Grafting in solanaceous and cucurbitaceous vegetables for mitigation of edaphic constraints" organized in commemoration of Golden Jubilee Year of ICAR-IIHR, Bangalore.	CHES, Bhubaneswar	30 November, 2016	L.P Sahoo
39.	National Seminar on "Aquaculture diversification: the way towards blue revolution"	ICAR-CIFA	1- 3 December, 2016	Tanuja S.
40.	Attended 6 th International Science Congress (ISC-2016) being organized by International Science Community Association and presented paper	Hutatma Rajguru Mahavidyalaya, Rajgurunagar, Pune, Maharashtra, India	8- 9 December, 2016	L.P Sahoo
41.	ICAR sponsored Short Course on "Integrated Farming System: An Approach towards Livelihood Improvement of Farm Women and Natural Resource Conservation"	ICAR-CIWA	14- 23 December, 2016	Gayatri Moharana, Ananta Sarkar
42.	Rural Program Subject Committee (RPSC) Meeting	All India Radio, Cuttack	16 December, 2016	Sabita Mishra
43.	Brainstorming Session on Disease Management Strategies Under Changing Scenario in Horticultural Crops	CHES, Bhubaneswar	20 December, 2016	Naresh Babu
44.	VII Workshop of All India Co-ordinated Research Project on Ergonomics and Safety in Agriculture	NAS Complex, New Delhi	21-22 December, 2016	Chaitrali Mhatre
45.	<u>Workshop on "Reaching Farm Women through Media"</u>	<u>ICAR-CIWA</u>	<u>4 January, 2017</u>	<u>Tanuja S., L.P Sahoo, Jyoti Nayak</u>
46.	Stakeholders' Meeting	NABARD, Bhubaneswar	13 January, 2017	J. Charles Jeeva
47.	Second Workshop of Nodal Officers of ICAR Research Data Repository for Knowledge Management Initiative	NASC, New Delhi	24-25 January, 2017	Ananta Sarkar
48.	Workshop on "KrishiKosh Repository: A tool for strengthening Agricultural Knowledge" jointly organized by OUAT and AKMU, ICAR	OUAT, Bhubaneswar	27 January, 2017	L.P Sahoo
49.	RKVY meeting on finalization of new projects proposed for Midterm plan	Committee Room of State Secretariat	27 January, 2017	Gayatri Moharana

50.	Brainstorming Session on management of Sweet Potato Weevil: Present Status and Future Directions,	Regional Centre of ICAR- CTCRI , Bhubaneswar	4 February, 2017	S.K.Srivastava
51.	Forging Partnerships in Research for Societal Development	Institute of Life Sciences, Bhubaneswar	10 February, 2017	A.K. Panda
52.	AICRP on Home Science, XXII Biennial Workshop	Assam Agriculture University, Jorahat	10-11 February, 2017	Jatinder Kistwaria, Jyoti Nayak, Abha Singh Gayatri Moharana
53.	Competency Enhancement Programme for Effective Implementation of Training Functions by HRD Nodal Officers of ICAR	HRM Unit, ICAR and ICAR-NAARM, Hyderabad	23-25 February, 2017	J. Charles Jeeva
54.	हिंदी संगोष्ठी on अधिक सवाल-जवाब मंडिजानिक तथा तकनीक संस्थान की भूमिका	Institute of Physics, Bhubaneswar	27 February, 2017.	Staff, ICAR-CIWA
55.	Meeting on State level Agriculture Fair (Krushi Mahostav) - 2016-17	Rajiv Bhawan, Dept. of Agriculture and Farmers Empowerment, Odisha	02 March, 2017	Sabita Mishra
56.	Eastern Zone Sports Meet	NRRI, Cuttack	06-09 March, 2017	Staff, ICAR-CIWA
57.	Workshop on "Innovation in Food Safety and Security" organized by OUAT in collaboration with Planning and Convergence Department, Government of Odisha	OUAT, Bhubaneswar	09-10 March, 2017	L.P Sahoo
58.	National Seminar on "Priorities in Fisheries and Aquaculture"	College of Fisheries, Rangeilunda, Odisha	11- 12 March, 2017	Tanuja S.
59.	Rural Programme Subject Matter Training of All India Radio	AIR, Cuttack	14 March, 2017	L.P Sahoo
60.	Krishi Unnati Mela 2017	ICAR-IARI	15-17 March, 2017	L. P. Sahoo
61.	Workshop on Smallholder poultry for Improving Productivity	SMILE, Bhubaneswar	16 March, 2017	A.K. Panda
62.	Workshop on Promoting Agricultural Education among Rural Women for Entrepreneurship Development	ICAR-CIWA, Bhubaneswar	18 March, 2017	Sabita Mishra
63.	State Level seminar on Plant Architecture and Flower Regulation in Mango	CHES Bhubaneswar.	18 March, 2017	Naresh Babu
64.	Workshop on Protecting and Exploiting Inventions Through Intellectual Property Rights	Odisha Bigyan Academy, Bhubaneswar	29 March, 2017	A.K. Panda
65.	Meeting of Advisory Committee of Ph.D student at Dept of Seed Science & Technology	College of Agriculture OUAT, Bhubaneswar		L.P Sahoo

DISTINGUISHED VISITORS

Sl. No	Name	Date
1.	Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR)	24 April, 2016
2.	Dr. Jeet Singh Sandhu DDG Crop Science, ICAR	15 June, 2016
3.	Sujata R.Karthikeyan, Commissioner-cum-Director, Odisha Watershed Development Mission, Govt. of Odisha	1-2 June, 2016
4.	Shri Manoj Ahuja, Principal Secretary, Department of Agriculture & Farmers Empowerment, Govt. of Odisha	1-2 June, 2016
5.	Dr. N. S. Rathore, DDG, Education,	28 July, 2016
6.	Sujata R.Karthikeyan, Commissioner-cum-Director, Odisha Watershed Development Mission, Govt. of Odisha	15 - 16 September, 2016
7.	Dr. S. Pasupalak, Vice- Chancellor (OUAT, Bhubaneswar),	15 - 16 September, 2016
8.	Dr. S K Sharma, Ex Vice-Chancellor, HPKV	22 October, 2016
9.	Shri. Chhabilendra Roul, Addl. Secretary (DARE) and Secretary (ICAR)	24 October, 2016
10.	Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR)	17 February, 2017
11.	Dr. N. S. Rathore, Deputy Director General (Agriculture Education),	17 February, 2017
12.	Dr. A. K. Singh, Deputy Director General (Agriculture Extension),	17 February, 2017
13.	Dr. S. Pasupalak, Vice- Chancellor (OUAT, Bhubaneswar),	17 February, 2017
14.	Dr. T. Janakiram, Assistant Director General (Horticulture),	17 February, 2017
15.	Dr. V. V. Sadamate, Former Member of Planning Commission	17 February, 2017
16.	Dr. Asha Hans, Gender Expert	17 February, 2017

DIRECTOR'S VISIT

Date	Place	Purpose
18-20 February, 2016	New Delhi	Attended the review meeting of AICRP on Home Science and Discussed EFC approved projects at NASC Complex, New Delhi.
26 February, 2016	CIFA,BBSR	Interaction & presentation with Shri Chhabilendra Roul, Addl. Secretary(DARE) & Secretary (ICAR).
15 March, 2016	OUAT, BBSR	Attended the Annual Function as a Chief Speaker
18 March, 2016	New Delhi	Discussed at SMD, ICAR-KAB-II, PUSA.
19 March, 2016	New Delhi.	Attended the Krishi Unnati Mela, at IARI
21-22 March, 2016	Ludhiana	Attended the review meeting of AICRP on Home Science at PAU, Ludhiana.
28 -29 April, 2016	New Delhi	Met and discussed with SMD Attended the Unit meeting of AICRP on Home Science at NASC Complex, New Delhi
3 May, 2016	Patna	Attended the Second Green Revolution meeting at Patna.
6 May, 2016	New Delhi	Nominated to attend the meeting on "National Consultation for addressing Nutrition Challenges at Conference Hall No.301, 2 nd Floor, ICMR, New Delhi
18 May, 2016	New Delhi	Attended the meeting for Bringing Green Revolution in Eastern India on at 10.00 a.m. in Krishi Bhavan, New Delhi.
20 May, 2016	Jorhat, Assam	Attended the Unit meeting for Food and Nutrition Component of AICRP on Home Science at Jorhat, Assam & discussed planning of Biennial Conference.
24 -25 June, 2016	Hyderabad	Attended the XXIII meeting of ICAR Regional Committee-II at ICAR-National Academy of Agricultural Research Management (NAARM), Hyderabad.
01 August, 2016	New Delhi	Attended a Unit meeting AICRP on Home Science at New Delhi.
09 August, 2016	Chennai	Attend the meeting Regional Consultation on "Enhancing productivity and profitability of pulses for addressing food and nutrition security" at Chennai.
10 August, 2016	New Delhi	Attended meeting with Prasarbharati, New Delhi
23 August, 2016	Sabour, Bihar	Conducted KVK training programme on "Gender mainstreaming and women empowerment to Scientists" at BAU Sabour, Bihar
26 August, 2016	New Delhi	Participated in talk show Vad-Samvad programme on "Women in Agriculture" at DD Kisan, New Delhi.
27 August, 2016 - 01 September, 2016	Hyderabad	Participated in the "Executive Development Programme (EDP) on Leadership Development "at Hyderabad
20-21 September, 2016	Parabani	Attended the State Level Workshop for KVK Home Science and Programme Coordinators on the theme of Enhancing Health, Development and Contribution of Rural Women & Children at Parabani.
13 -14 October, 2016	New Delhi	Met and discussed with SMD at New Delhi.
7 November, 2016	New Delhi	Attended an inter-divisional meeting with SMD at New Delhi.
9 November, 2016	Patna	Attended final Viva-Voce examination at Rajendra Prasad Agricultural University, Bihar, Patna.
19 December, 2016	New Delhi	Attended meeting with Prasarbharati at New Delhi and discussion at SMD.
20 December 2016	New Delhi	Attended the Jury Convention-Phase II for MSIAA at New Delhi.
28 -29 December, 2016	Khagarpur.	Attended the International Conference on emerging technologies in Agricultural and Food Engineering at Khagarpur.
30 January 2017	New Delhi	Attended Assessment Committee CAS constituted by the Chairman ASRB, New Delhi
2 Feb., 2017	New Delhi	Attended Mahindra Samridhi India Agri Awards 2017 at New Delhi
10-11 February, 2017	Jorhat	Attended "Biennial workshop" AICRP on Home Science on 10-11 February, 2017 at Assam Agricultural University, Jorhat.
14 February, 2017	New Delhi	Attended the ICAR-AICRP Review Committee Meeting to be held at NBPGR, New Delhi on 14.2.2017 at 10.00 a.m.
14-15 February, 2017	New Delhi	Participation in the Annual VCs Conference of AUs and Director's of ICAR Institute to be held at New Delhi on 14-15 February, 2017
22-23 February, 2017	Chandigarh	Meeting & site visit with Executive Director, Punjab State Council for Science & Technology, Chandigarh for collaborative prospects of value chain based entrepreneurship development.
27 February	New Delhi	Discussed on Draft EFC for 2017-20 with DDG(Ag.Edn) on 27 th February at New Delhi.

RESEARCH PROJECTS 2016-17

Institute Projects

Sl. No	Name of the Project	Duration	PI & Co-PIs
1	Development of resource efficient horticulture model for livelihood improvement of rural women	2013-2017	Dr. Naresh Babu Dr. S. K. Srivastava Dr. Abha Singh
2	Identification of gender issues in IPM and suitable intervention with women perspective	2013-2017	Dr. S. K. Srivastava Dr. Naresh Babu Dr. Sabita Mishra
3	Assessment of integrated farming models for improved food security and livelihood in rural household	2013- 2017	Dr. Jyoti Nayak Dr. Abha Singh Mrs. Tanuja, S.
4	Study on gender related indices in agriculture	2013-2017	Dr. Ananta Sarkar Dr. H. K. Dash
5	Gender work Participation Scenario in Agriculture	2013-2017	Dr. H. K Dash Dr. Ananta Sarkar
6	Ergonomic evaluation of selected manually operated farm equipments in mango and cashew nut	2013- 2017	Ms. Gayatri Moharana Dr. Naresh Babu Ms. Chaitrali Mhatre
7	Multi-sectoral Package of Practices for Nutrition and Livelihood Enhancement of Tribal Families (Tribal Sub Plan)	2014-2017	Dr. J. Charles Jeeva Ms. Gayatri Moharana
8	Engendering finger millet based Value Chain for Improving Livelihood Opportunities of farm Women	2014-2017	Dr. J. Charles Jeeva Dr. Abha Singh
9	Promoting gender equity through family poultry production	2016-2019	Dr. A. K. Panda Dr. H. K. Dash Dr. B. Sahoo Dr. Abha Singh
10	Enhancing income of rural women through improved goat rearing	2016-2019	Dr. Biswanath Sahoo Dr. Anil Kumar Dr. A. K. Panda Dr. Sabita Mishra
11	Improving availability of quality pulse seed with participation of women	2016-2019	Dr. L. P. Sahoo Dr. Jatinder Kishtwaria Dr. S. K. Srivastava Ms. Chaitrali Mhatre
12	Exploratory study on nutritional status of Nabarangpur district, Odisha (Inter Institutional Project with Regional Station CTCRI, Bhubaneswar)	2016-2019	Dr. S. K. Srivastava Dr. Ananta Sarkar Ms. Gayatri Moharana Dr. Korada Rajashekara Rao Dr. Archana Mukharjee

Externally funded Research Project

Sl. No	Name of the Project & PI	Duration	PI & Co-PIs
13	Technological interventions for drudgery reduction with increased work efficiency through women friendly/ farm tools/ equipment technologies in the state of Odisha (RKVY Project)	2013-2017	Dr. Jyoti Nayak Dr. Sabita Mishra, Dr. Abha Singh, Ms. Gayatri Moharana Ms. Chaitrali Mhatre

Collaborative & Outreach Projects

Sl. No	Name of the Project	Duration	PI & Co-PIs
10	Integrated farming system for improvement of nutrition and livelihood of farm women under different agro-ecosystems	2015-2017	Dr. S. K Srivastava Dr. Abha Singh Mrs. Tanuja S.
11	Livelihood and nutritional improvement of tribal farm women through horticulture	2015-2017	Dr. Naresh Babu Dr. Charles Jeeva Dr. L. P. Sahoo
12	Empowerment of farm women through livestock technologies	2015-2017	Dr. Anil Kumar Dr. B. Sahoo Mrs. Tanuja S. Dr. Shivaji D. A.
13	Empowerment of farm women for improved quality of life	2015-2017	Dr. Abha Singh Dr. Jyoti Nayak Dr. L. P. Sahoo
14	Outreach project on 'Development and testing of institutional innovations for empowering women in agriculture'	2015-2017	Dr. Sabita Mishra Dr. L. P. Sahoo Ms. Gayatri Moharana Dr. Ananta Sarkar Dr. Argade Shivaji Dadabhau

Flagship Project

15	Gender Knowledge System in Agriculture	2015-2017	Dr. H. K. Dash Dr. Ananta Sarkar Dr. Jyoti Nayak Dr. Argade Shivaji Dadabhau
16	Ergonomic studies for increasing working efficiency and productivity of farm women	2015-2017	Er. Chaitrali Mhatre Dr. Jatinder Kishtwaria Ms. Gayatri Moharana Dr. Jyoti Nayak

Extral CAR-Extramural Research Project

17	Promoting Agricultural Education among Rural Women for Entrepreneurship Development	2016-2017	Dr. A. K. Panda Dr. Jatinder Kishtwaria Dr. Sabita Mishra Dr. H. K. Dash Dr. B. Sahoo Dr. Abha Singh Dr. L. P. Sahoo
	Strategic platform		
	Gender in Agriculture Partnership (GAP)	2015-2017	Dr. H. K. Dash Dr. A.K. Panda Dr. Jyoti Nayak Dr. Ananta Sarkar
	All India Co-ordinated Research Project		
	All India Co-ordinated Research Project on Home Science	2012-2017	Dr. Jatinder Kishtwaria (Project Co-ordinator) Dr. Jyoti Nayak (Scientist in-charge)

PERSONNEL

Sl no	Name	Designation
1	Dr.Jatinder Kishtwaria	Director
2	Dr.S.K.Srivastava	Principal Scientist
3	Dr.Anil Kumar	Principal Scientist
4	Dr.Arun Kumar Panda	Principal Scientist
5	Dr.(Mrs) Sabita Mishra	Principal Scientist
6	Dr.(Mrs) Jyoti Nayak	Sr.Scientist
7	Dr. Charles Jeeva	Sr.Scientist
8	Dr. Ananta Sarker	Sr.Scientist
9	Dr.Biswanath Sahoo	Sr.Scientist
10	Dr.(Mrs) Laxmipriya Sahoo	Scientist(SS)
11	Mrs.Tanuja S.	Scientist
12	Ms.Gayatree Moharana	Scientist
13	Dr.Argade Shivaji Dadabhau	Scientist
14	Er. Chaitrali Shansank Mhatre	Scientist
15	Mrs.Ankita Sahoo	Scientist
16	Sh. Jairam Biswal	Administrative Officer
17	Sh Shaji A.	Technical Officer
18	Sh.Janardan Biswal	AF & AO
19	Mrs.Geeta Saha	Technical Officer
20	Mrs.Parisima Sen	Private Secretary
21	Mrs.Bishnupriya Moharana	Asst.Administrative Officer
22	Sh.Manoranjana Prusty	Sr.Tech.Assistant
23	Sh.Debendra nath Sarangi	Sr.Tech.Assistant
24	Sh.Bhikari Chran Behera	Sr.Tech.Assistant
25	Sh.Bishnu Charan Sahu	Sr.Tech.Assistant
26	Dr. Sujit Kumar Nayak	Sr.Tech.Assistant
27	Er. Pragati Kishore Rout	Technical Assistant
28	Mrs.Tapaswini Sahoo	Technical Assistant
29	Sh.Sanjay Kumar Behera	Technical Assistant
30	Sh.Atul Chetan Hemram	Technical Assistant
31	Sh.Subrat Kumar Das	Technical Assistant
32	Sh.Parikshit Mallick	Stenographer Gr-III
33	Sh. Jyoti Ranjan Das	Senior Clerk
34	Sh.Biswanath Biswal	Supporting Staff Service

Appointment/ Transfer/ Retirement

Sl no	Name	Designation	Date
1	Dr.Naresh Babu	Principal Scientist	22nd March,2017 (Transfer)
2	Dr.H.K.Dash	Principal Scientist	31st March,2017 (Transfer)
3	Dr. Abha Singh	Sr. Scientist	9th March,2017 (Transfer)
4	Sh.V.Ganesh Kumar	Asst. Administrative Officer	19th October,2016 (Promotion)
5	Mrs.Ankita Sahu	Scientist	8th April,2016 (Appointment)

