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Empowering Women in Agriculture

With growing concern and realization on the need for empowering women in agriculture, focus has been on developing core competencies in the area of gender issues in agriculture, capacity building of stakeholders and inclusion of women perspective as an in-built component in agricultural research. In this context, a number of research and outreach programmes in institutional and collaborative mode were undertaken.

Technology application and gender mainstreaming in agriculture: In model village project, gender issues involved in transplanting of rice were studied in association with a local NGO. It was observed that the line planting took 20 per cent more time as compared to random planting. Men were involved mostly in carrying seedlings to the field (80.20%) and stretching rope for line planting (49%) while women were engaged in transplanting (98.80%) and making bundles of seedlings (65.60%). Ergonomical parameters such as musculo-skeletal discomfort (highest in midback and lowest in ankle), physiological stress (heart rate 88.7 to 103 beats/minute) and grip fatigue were within the acceptable range.

The composite analysis of extension needs indicated that out of nine dimensions, there were significant differences (more than 10%) between women and men in eight areas such as type of extension contacts, suitable time of contact, place of extension contact, effectiveness of extension agent, effectiveness of group method, boundary of tour, interval of contact and place of meeting.

Only in one case, i.e. approach for undertaking enterprise, there was no significant difference (less than 10%) between genders. The reasons being the socio-cultural environment, family responsibility, restricted mobility, less time availability, dual responsibility, lack of self confidence and lack of decision making power with farm women

Storage pest management: Under the project on Refinement of storage pest management techniques in selected cereals, pulses, condiments and spices, data

were collected from 10 states. It was found that farm women prefer to store these items with the use of easily available additives without any standard dose at house hold level. On this aspect, an attempt was made to standardize the doses of easily available additives for the storage of cow pea seeds. Different doses of small and big cardamom, garlic cloves @ 10, 20, 30 number, salt, camphor (*Cinnamomum camphora*) @ 10,20,30 g, asafoetida (*Ferula asafoetida*) @ 2,4,6 g, clove (*Syzygium aromaticum*) @ 5,10,15 number, sand @ 1200 g and neem oil @ 5ml/kg were evaluated for the storage of cow pea seeds in the earthen pots. Use of sand was found very effective to minimize the egg laying and reduction in the multiplication of the insects in terms of number of eggs of cowpea seed weevil (*Callosobruchus*

First Global Conference on Women in Agriculture

The first Global Conference on Women in Agriculture held in New Delhi in March, 2012 deliberated upon a range of issues concerning women in agriculture. Some common areas of action included: Setting up of a platform for Gender in Agriculture Partnership (GAP) with hubs in different countries and its Secretariat in India to empower women for inclusive growth in agriculture; Research on human behaviour to support engendering agriculture; Forming advocacy groups to influence policies to empower women in agriculture; Policy analysis to provide alternatives and choices to farm women and Establishing gender assessment and monitoring units in R & D organizations. Further, the important recommendations of the Conference were: (i) assessment of women's empowerment in agriculture including technological needs, capacity building of researchers on gender issues, development of methodologies, tools and indices for assessment and generation of sufficient data/evidence on empowerment of women and engendering of R&D systems; (ii) development of a framework for generation, refinement and delivery of agricultural innovations for reducing drudgery; (iii) linking women farmers to markets keeping in view impact of policies, technologies and drivers and factors influencing linkages and identification of opportunities for collective group actions; (iv) role of women in household food and nutrition security including development of science and technology based innovations to address nutrition related issues at community level involving women groups; (v) development of indicators to measure access of farm women to assets, resources, knowledge, policies and services; (vi) impact of climate change related risks and uncertainties including assessment of agricultural vulnerability and strategies practiced by different communities to cope with the impact of climate change, enabling policy to support availability of clean energy, water, food, health and hygiene.



Evaluation of different additives against cow pea seed weevil



maculates), number of bored grain and germination percent. Use of big cardamom @ 10 number, asafoetida @ 6 g and small cardamom @ 20 number /kg seed were found effective as standard doses to minimize the egg laying of the insects. Due to juvenomimetic effects, the neem oil was also found effective to save the cowpea seeds from insect damage without any adverse effect on germination up to eight months of storage. These options of storage pest management for cowpea seeds were found gender friendly due to easy applications, availability at village level and their freeness from any type of chemical hazards.

Women in horticulture: To make quality planting materials available to rural women, *in vitro* propagation technique for pointed gourd was optimized using the nodal portion as explants. The best initial micro-shoot response was obtained when the explants were cultured on the MS medium containing Kinetin 8.0 mg/l. The sub-culturing medium with 4.0 mg/litre NAA produced maximum regenerated shoots with good shoot growth. *In-vitro* rooting was optimized with 0.4 NAA mg/litre that gave highest root initiation and also number of roots. Considering the potential of vegetables,



Training on processing and value addition

technologies have also been standardized for protected cultivation of off- season tomato and cucumber; which gives returns of ` 250–400/ m² annually. Farm women were trained to upgrade their skills to earn more returns from the unit area of poly house/ net house. To reduce substantial post-harvest losses of the rainy season guava, lemon and ginger blended guava squash was prepared to enhance economic value of the crop. Guava-lemon-ginger squash was prepared with 22.5% guava juice, 5.0% lemon juice and 1.5% ginger juice. With the addition of 200 ppm potassium metabisulphite, the product can be kept for 80-90 days in refrigeration (4°C). The TSS, acidity, pH and total sugar of the product were 43.5 °Brix, 1.32%, 3.4 and 41.5%. Squash is rich in vitamin C content (212–235 mg/100g) and antioxidants.

Enhancing livelihood of rural women through livestock: Landless women in Giringaput village were motivated to initiate backyard poultry to increase the income and household nutritional security. Capacity building was done for scientific rearing of birds, making balanced diet and disease control. The male birds were

sold at 2.5 to 3 months of age earning them ` 225 per bird. The female birds were retained for egg laying which were consumed in the household. Women were encouraged to make low cost houses for poultry birds using locally available materials like bamboo and polythene sheet to prevent predation by wild cats. In the tribal hamlet of the Giringaput village, the villagers kept cattle mainly for draft purpose. The cattle rearing practices included grazing of the animals in groups during day time and supplementary feeding by offering paddy straw only in the evening. Demonstrations on green fodder production technology were conducted by introducing hybrid napier along the field boundaries of twenty farmers. The farmers reported that the milk yield in cattle was increased by 0.5 litre by supplementary feeding of green fodder. These farmers have also shown interest to take up fodder cultivation on larger plots.

AICRP on home science: The All India Coordinated Research Project (AICRP) on Home Science is in operation in ten State Agricultural Universities. The main thrust of the project is on empowerment of rural women for enhancing the quality of life of farm families. It focused on development of gender specific database and training modules for farm women, technology interventions for drudgery reduction in agriculture, nutritional security and health promotion of farm families, promoting vocational skills among adolescent girls, value addition of under-utilized natural fibre resources, utilization of degradable and non degradable farm waste and empowerment of rural women.

Three technologies were developed and one was modified to mitigate drudgery and occupational problems of women working in different production systems. At AAU, Jorhat a ladle made of iron with wooden handle was designed and fabricated for parboiling of rice. Mittens were developed by MKV, Parbhani for farmwomen involved in harvesting of okra and brinjal. A portable comb type ground nut stripper was developed by MPUA&T, Udaipur. A portable briquette stove with hand blower was fabricated in association with a private partner by ANGRAU, Hyderabad.

A work station with seating comfort was developed for *petha* making. It facilitates postural improvement of body movement while cutting, pricking and processing *petha*. The activities like cutting *petha* into



Okra and brinjal mittens



cubes and handling hot spots are easily done by using safety gloves and masks. Similarly, the mechanical method of cotton picking with a cotton picking machine reduced the physiological cost of work of women significantly by 9.52% compared to manual method and increased the cotton picking efficiency by 6 per cent.

Data pertaining to 8,875 households from 46 agro-climatic zones was used and analyzed through selected indicators to study gender issues. For economic empowerment of women, nine training modules were developed for establishment of microenterprises. Results show that, in the Upper Central Brahmaputra Valley Zone of Asom, more than half of rural women participated independently in dehusking, cleaning, shelling, grading, drying, storage, parboiling and processing of rice. Though women played a major role in livestock management activities, men had the complete responsibility in care of livestock (71.38%), care of sick animal (71.27%), feeding of animal (70.37%) followed by fodder management. Overall picture of gender based participation in agriculture in the state of Himachal Pradesh show joint participation in farming, homestead gardening, horticulture, post harvest operations and animal husbandry by majority of the men and women. Percentage of independent participation by women was noticeably higher in case of homestead gardening (24.73%), post harvest (16.74%) and livestock management (18.27%). In Tarai and Bhabar zone of Uttarakhand, women from small land holding and landless category extensively participated in transplanting, weeding and harvesting. However, in this zone, independent role and complete responsibility was dominated by men 55.74% and 64.33% respectively, whereas in the hill zone rural women had independent role (52.61%) and complete responsibility of farming activities (62.33%).

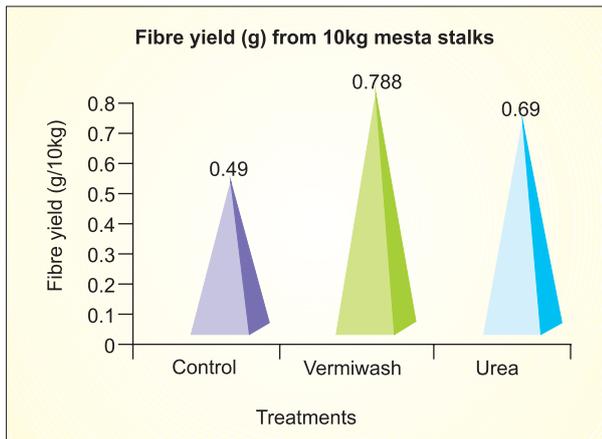
In order to combat micro-nutrient deficiencies among rural families, 510 nutrition gardens were established in *rabi* and *kharif* season in 45 adopted villages of nine states including Andhra Pradesh, Asom, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, Rajasthan and Uttarakhand. Commonly used recipes were selected and modified by different centres to obtain a minimum of 6-8 mg of iron/ serving. Forty-five recipes have been modified to obtain the desired iron value. The value of iron ranging from 4.7 mg in *poha* was reported by Ludhiana and 29.09 mg in *khatta meetha namkeen* of Palampur. The recipes were developed using different food groups. Fifteen recipes were based on cereals, six on pulses, four had nuts and oilseeds, six with green leafy vegetables and four with root vegetables. Remaining were developed by mixing different groups. Iron sources used in the recipes are lotus stem, rice flakes, Bengal gram flour, niger seed, mint powder, *rajkeera* seed powder, etc.

Major health hazards encountered while performing various farm activities during spraying of pesticides and threshing of different crops were eye irritation/itching as reported by Hisar (76.66%), Pantnagar (80%),

Ludhiana (47.5%) and Parbhani (33.33%) centres. Problems encountered during vegetables and flower cultivation varied from vegetable to vegetable and flower to flower and included backache due to bending during transplantation and plucking, cuts in hand, allergy in hand/arms. Clothing used during farm activities included *Kurta Pyjama*, *Kurta-Lungi*, Kurta, trousers. *Safa/ Towel/ Gamucha/ Pagri* were used for protection of head. Most commonly used dress among women farm workers was *Kameez-Salwar* with *dupatta* as reported by Hisar, Ludhiana and Palampur centres whereas *Saree-Blouse* was being worn by women workers of Hyderabad, Dharwad, Pantnagar and Parbhani. Udaipur centre reported that *Blouse-Ghagra* and *Odhani* were worn by women workers and in Asom, *Blouse-mekhla* and *chaddar* were worn. To cover head, *dupatta* /towel or scarf was used. Hisar centre developed educational package on protective clothing for farm workers to disseminate the information to the target group for popularization of technology using pamphlets, video film and interactive CD. Three pamphlets were developed on i) Keetnashak *Sambandhit Karya Karne Vale Pursho Ke Liye Surkshatmak Vastar* (In Hindi), ii) *Threshing Karne Vale Pursho Ke Liye Surakshatmak Vastra* (In Hindi) and iii) *Threshing Karne Vali Mahilaon Ke Liye Surakshatmak Vastra* (In Hindi).

To study clothing disinfecting practices, data were collected from 660 respondents in the age group of 21-30 years or 31-40 years comprising rural and urban women. For disinfecting clothes, majority of the respondents used carbolic acid formulation while *neem* soap was used by a few respondents. Other respondents used ordinary soaps and detergent powders. Amongst disinfectants from natural sources, *neem* leaves were being used by majority of the respondents and *tulsi* leaves were also reported by a few respondents. Amongst synthetic disinfectants, a popular antiseptic solution was used in the final rinse by majority of the respondents. Clothes were also sun dried to disinfect them. Majority of the respondents had knowledge regarding medicinal value of *neem* and *tulsi* leaves, turmeric, ginger and garlic. A few respondents also had knowledge about medicinal nature of eucalyptus, orange peels or pomegranate rinds.

Dharwad center standardized a fibre extraction method from Mesta and Sunhemp and studied the effect of retting process on fibre yield and quality. Mesta species, *Hibiscus sabdariffa*, variety AS73, CD 560 and sunhemp species, *Crotalaria juncea*, grown in Institute of Organic Farming, UAS, Dharwad were selected for the study. The harvested stalks were dried completely and then subjected to retting. It retted after nearly 200 hours to decompose and it was used as control sample. To accelerate the retting process, biological cultures, i.e. 2% vermiwash, 2% urea, an organic compound were added. Fiber yield of Mesta and Sunhemp stalks treated with 2% vermiwash had maximum fiber yield. Fiber extracted from urea treated stalks was found to be longest whereas control sample



depicted better fineness, strength and elongation percentage. Sunhemp stalks treated with 2% urea exhibited an increase in fiber cell length, length of fiber strand, strength and elongation than control, while fiber fineness reduced after urea treatment. The fibers extracted with vermiwash exhibited better strength and elongation percentage. On the other hand, reduction in fiber cell length, length of fiber strand and fineness was observed after vermiwash treatment.

Parbhani centre conducted Phytochemical Analysis of leaves of five plant sources, viz Ashoka, Lantana camera, Lemon, Drumsticks and *Catharanthus roseus* to assess the anti-microbial properties of the plants.

The training module on Life Skill Education, developed for rural adolescent girls under AICRP during the previous plan was used for capacity development of youth. The module consists of 54 different lessons based on day to day situations. Participants were encouraged to actively involve in activities through which they could develop various life skills. These lessons are very easy, simple and can easily be adapted

to age, gender, local situations and language. The approach is completely interactive, using role plays, games, puzzles, group discussions and other techniques to keep the participants involved during the sessions.

Results of the pre tests and post tests carried out on nine life skills showed an improvement in terms of mean scores showed comparatively better results in empathy and communication skills than the rest. Trainings at the field level were organized where rural girls actively took part in the activities related to the skills. Thirty-three (33) training programmes were conducted by all these centres on life skill education, parent adolescent relationship, management of adolescent behavior and income generating activities and about 865 beneficiaries, comprising rural youths, mothers, adolescent girl, *anganwadi* workers and *anganwadi* children.

Feedback from 30 fly shuttle weavers from different enterprises was taken on an ergonomically weaving chair designed by AAU, Jorhat. The results showed that all of the users were highly satisfied with the improved chair. Further, the weaving enterprises were ready to fabricate/adopt the chair in order to reduce musculoskeletal disorders prevalent among fly shuttle weavers. Moreover, initiative for dissemination of ergonomically designed weaving chair in different KVKs of AAU has been undertaken. Paddy harvesting with serrated sickle improved the pace of work by saving about 4 hours/ acre, reduced the human power needed for paddy harvesting by 2.37 labour days, increased the work output per hour and reduced the drudgery score (4.43) and disorders score (5.73) significantly by 13.09 and 9.10 respectively. The use of potato picker resulted in picking of 52kg potatoes as against 25 kg by the traditional method.

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