

16. Gender Issues for Technological Empowerment of Women in Agriculture

Directorate of Research on Women in Agriculture carried out basic, strategic and applied research pertaining to gender issues, and gender mainstreaming through developing women-friendly technologies in various sectors of agriculture. The main technological focus was on drudgery reduction, nutritional and livelihood security among tribal families, use of information communication technologies and creating a national database on gender. Other areas of activities undertaken by the Directorate were technology assessment and refinement and developing women-friendly tools through AICRP on Home Science and six network projects covering 100 locations in the country.

Reducing operational drudgery: Prototype of hand-operated maize dehusker-cum-sheller for dehusking and shelling the cob in a single unit was designed and developed at Sub Centre, DRWA, Bhopal. During calibration of subject, all the subjects involved for the study showed same trend in their heart rate response at graded load for each hand cranking speed. The output of prototype was 83.6 kg cob/hr and 83 kg cob/hr in standing and sitting mode, respectively, of hand cranking by the subject. The prototype of hand-operated maize dehusker-cum-sheller reduced the physiological cost by 40.21 and 23.68% in dehusking-shelling the maize cob with hand, and tubular maize sheller respectively.

Gender data base: A reference system on gender studies created with the objective of providing researchers, access to relevant references and studies. About 2,800 references and studies related to gender in agriculture were collected from various sources such as journals, annual reports, proceedings, books etc. Theme-wise analysis of the data indicated that studies on women empowerment received more priority whereas areas such as access to and control over resources, technology testing and refinement and policy received less attention among researchers. The data base was further enriched by incorporating gender disaggregated data on agriculture collected from 9,673 households of nine states covering 55 agro-climatic zones under AICRP on Home Science. Under network projects data were collected from 14 states covering 96 locations in the country.

Assessment of gender needs in aquaculture technologies: The gender participation and needs related to mussel culture was studied for understanding the technological and training needs of women under the study carried out in Kerala. Women did seeding, accounting, marketing, meat sucking, post-harvest processing and disposal of shell, which accounted for more than 90% of their participation. Women and men together carried out operations including site selection,

procurement of seed, fabrication of nets and harvesting. Women were involved in decision-making process and also controlled money transaction. Study conducted in Chilika Lake in Odisha revealed that in crab fattening, the operations including pond preparation, feeding, watch and ward and financial management were independently carried out by women. However, women required men's help for collection of soft crab for farming from the market and trash fish for feeding the crab and marketing.

Gender and livestock production: The study conducted at Odisha, Uttar Pradesh, Tamil Nadu, Maharashtra, Assam, Nagaland and Meghalaya indicated that women were well equipped with traditional livestock rearing practices as they were associated with the activity since childhood. Backyard poultry and goatery were common across the locations studied, whereas piggery was practised in small-scale in north-eastern states and dairy in Uttar Pradesh and Tamil Nadu. The income generated from livestock was mostly utilized for children's schooling, purchase of seed/planting material and for household consumption.

Gender role in livestock production is rapidly changing due to urbanization, migration and mechanization of agricultural activities. Women spent about 860 calories/day for performing various animal husbandry activities. The highest drudgery prone activities were chaffing of fodder, disposal of dung, cleaning of shed, preparing of cow dung-cake and milking. The total cardiac cost of work and physiological work load of rural women in performing the activities were very high with traditional tools. The constraints in adoption of improved practices included lack of finance, difficulty in availing credit, non-availability of quality inputs in time and in some cases high cost of technologies. The training needs included identification of fertility problems, feeding of animals, vaccination schedule, care of newly born calf and preparation of livestock products for which women were willing to participate in group discussions and avail extension services at village level.

Vanaraja and CARI Devendra birds were preferred for backyard system, as both birds and eggs fetch high price compared to other breeds. Annual earnings from backyard poultry were ₹ 1,000 for 30% women, between ₹ 1,000 and ₹ 3,000 for 44% and more than ₹ 3,000 for 23% women. Thus backyard poultry has a strong potential as an income generating activity for resource poor women.

In piggery the traditional practices of feeding included maize mixed with colocasia, yam and tapioca and during scarcity banana pseudo-stem and boiled wild plant leaves were fed. Nutritional studies indicated



Bruised fingers while plucking flowers



Finger guard for harvesting flowers

that slurry prepared by mixing and cooking colocasia, yam, tapioca, banana pseudo-stem and wild plant leaves with crushed maize was more nutritious and had better digestibility.

Cowpea production in kitchen garden: Application of farmyard manure @ 20 tonnes/ha resulted in 8.83 tonnes/ha yield of green pods of cowpea. Highest net returns of ₹ 23,680 and benefit cost ratio of 1.50 were recorded with farmyard manure application @ 20 tonnes/ha. Crop grown with farmyard manure treatment and packed in polyethylene bags @ 2% ventilation stored up to three days showed minimum physiological loss in weight (41.32%) under ambient conditions while it was 56.48% in open condition. Cowpea production involves low investment and can supplement family nutrition.

Amaranth cultivation for livelihood and improved nutrition: Amaranth (*Amaranthus* spp.), popularly known as *chaulai*, is very nutritive and highly suitable crop for kitchen gardening and commercial cultivation. Amaranth varieties, viz. Local Red and Green were tested by motivating a Self Help Group. Accordingly the Self Help Group in Mendhasala village in Khurda district of Odisha cultivated 800 m² of green amaranth with a yield of 0.88 tonnes/ha, which generated an income of ₹ 840 @ ₹ 2,000/tonnes within one month.

Involvement of tribal women in marketing of agricultural and non-timber forest produces: A study was undertaken by DRWA to assess the involvement of tribal women in marketing of non-timber forest produce (NTFP). Tribal women were engaged in marketing of most of the agricultural products such as cereals, pulses, vegetables, fruits, spices, value-added products, non-veg items, local wine (*handia*), salt, handicrafts and stationery items. No standard weighing and measuring practices were used by them. The forest based items including honey, tamarind, mushroom, green leaves, jackfruits, jackfruit seeds, mango, etc. were also marketed by them. Lack of proper transportation, long distance walk to reach the market and exploitation by the middle man were the major constraints reported by them. The market places were in open area without a shelter and other facilities.

All India Coordinated Research Project on Home Science: A survey on role of women in agriculture was conducted among 9,673 households in nine states.

The respondents included different categories of families, viz. 2,764 from landless, 3,997 under small farmers, 1,873 medium farmers and 1,039 with large land holdings. Information was collected on roles and responsibilities of men and women and their access to and control over various farm and home resources.

Based on the multi-locational field trials, drudgery reducing technologies were tested and transferred. Weeding tools including improved *khurpi*, *trishul* weeder, *saral khurpi* and hand weeder were transferred to farm women. Women-friendly drudgery reducing tools transferred also included improved rake for grain spreading, ring cutters for harvesting vegetables and flowers, finger guards for plucking of flowers, vegetable plucker for plucking vegetables, improved sickle and falcon sickle for harvesting paddy, cotton picking bag for collecting cotton while picking, maize shellers, groundnut decorticators, paddy row seeder, manual paddy thresher, wheel hoe, *gopal khore*, hand rake, gloves, capron and clod breaker.

Finger guards for plucking of flowers and water carrying bag for carrying water to higher altitudes were developed under the project. A trainers training module on drudgery reducing technology interventions for women in agriculture was also developed. Nutrition education was imparted to 3,170 farmwomen and adolescent girls through various information, education and communication programmes in the adopted villages. Training programmes conducted for promoting food-based enterprises for livelihood security benefited 1,300 farmwomen and adolescent girls. To address the problem of anemia, each centre developed an iron rich product named *lehyam* using locally available and underutilized green leafy vegetables. Altogether, 24 types of *lehyams*/formulations were developed. The iron content of the *lehyams* ranged from 8.53 to 37.59 mg/100 g.

Adolescent girls and young women in the age group of 11 to 25 years were provided vocational skills such as vermicompost preparation, creche management, preparation of educational play materials, soft toy making, food preservation, preparation of household utility items, embroidery and infant garment construction. For rural young mothers a training module on care and management of children was developed by each centre. Growth monitoring, supplementary nutrition, immunization and health check up were some



of the important parameters used for development of the module. *Anganwadi* workers and mothers of these children were imparted trainings on child care, development of educational play materials, health and nutrition. To empower the adolescent girls and young women a module was developed which included 10 life skills namely decision making, interpersonal relations, communication skills, self esteem, critical thinking, creative thinking, problem solving, empathy, stress management and ways of dealing with emotions.

Skill development training programmes were conducted for adolescent girls and farmwomen in the

preparation of natural dyes, dyeing, printing, embroidery, garment construction and designing, value-added hand-made paper products, soft toy making and herbal *gulal* making for economic empowerment. For combating occupational health hazards during pesticide application protective clothing such as cap with mask, hood with mask and upper garments, viz. *kurta* and *pyjama*, jacket with cap and *pyjama* (water proof) were developed for males, and scarf with mask, hood mask and beak mask for females.

Capacity building of stakeholders was carried out in gender analysis and gender sensitization methods.

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