15. Gender Issues for Technological Empowerment of Women in Agriculture

The Mandate of the National Research Centre for Women in Agriculture is—to identify gender issues and test appropriateness of available farm-technologies/programmes/policies with women perspective for promoting gender mainstreaming in research and extension for empowerment of farmwomen and capacity building of scientists, planners and policy makers to respond to the needs of the farm women. Accordingly the research projects on broad areas of testing of technologies, gender mainstreaming and capacity building activities were taken up.

Testing of technology with women perspective

As women participation in rice and groundnut production is higher, and the drudgery is involved in weeding, studies were conducted to **identify the ecofriendly weed management practices of these crops**. Rice variety Khandagiri and groundnut variety TMV 2 recorded the highest yield under weedy check implying that these varieties had highest tolerance to the weed infestation. Lowest weed dry weight was recorded in rice variety Nilgiri and groundnut variety TG 3 indicating that these varieties had weed smothering character.

Rice and groundnut under the impact of *Perotis indica* weed recorded the lowest yields and weed population beyond 125 plants/m^2 was the critical limit for reducing grain yield of both rice and groundnut in *kharif* season. Spacing geometry also reduced the weed infestation and lowest weed population was recorded with a combination of 160 cm^2/plant area and 3: 1 row to plant spacing ratio. The findings could help in reducing the workload of farmwomen to a great extent.

Grand Naine variety of banana, and Farm Selection and Pusa Dwarf of Papaya could be grown in homestead gardens for **nutritional security** and **income generation**.

Invigoration or traditional pre-sowing methods practised by farmwomen in different crops were documented under the project **Refinement of invigoration techniques as suitable to farmwomen for enhancing planting value of finger millet (*Eluesine coracana*) seeds**. Farm-saved seed samples of ragi (*Eluesine coracana*) were collected. Germination was less in 6-month-old farm saved seeds than the minimum seed certification standards. The seeds were having normal vigour (vigour index 21%). The seed treated with NaCl (5%) and urea (1%) enhanced the planting value of ragi seeds.

Trials with zero energy cool chamber (ZECC) for post harvest storage of vegetables—It was found suitable for rural women for storage of fresh farm produce like vegetables and fruits for 7–10 days without any loss of quality. As the relative humidity in the chamber remained more than 80% the fresh produce did not show any shrinkage. The temperature variation between ZECC and open fields during summer was 14–16°C. During rainy season the chamber was not effective as the outside temperature and humidity was equal to ZECC.

Ergonomical evaluation of manually operated OUAT ESA pedal operated paddy thresher with farm women revealed that the throughout capacity of the equipment was 79 kg crop/hr and the paddy grain output was 24 kg/hr. The speed of operation

A farm woman operating OUATESA pedal operated paddy thresher—higher work pulse suggests rest pauses for worker

was 77 pedal strokes/min. The force required in pedal operation was 162 N. The working heart rate of farm women was 136 beats/min and the work pulse value was 53 beats/min. Higher work pulse value suggests that adequate rest pauses need to be given to the worker for day long work. Two workers may be engaged with the equipment and they can operate the equipment in shift continuously.

Similarly, **ergonomical evaluation of manually operated CRRI rice winnower** revealed that the output with this equipment was 242 kg clean grain/hr. The winnower was operated by hand cranking at a speed of 65 rpm and the torque required was 5.3 Nm. The working heart rate of farm women was 112 beats/min. The work pulse value was 31 beats/min, which was under acceptable limit (resting heart rate plus 40 beats/min) for daylong work with standard rest pauses. Two workers are required for the operation i.e. one for cranking and another for feeding the material, collection of grain etc.

Farm women working on CRRI rice winnower—work pulse value was under acceptable limit

Gender mainstreaming

Gender disaggregated data on participation in household chores and other productive activities revealed that the woman contributed on an average 7.2 hr/day, whereas man contributed 1.6 hr/day to household activities. Apart from cultural factors structure and size of the household also influenced their contribution. The burden of household activities falls heavily either on married young and middle-aged women or on unmarried young girls. Number of women in a family is also a determinant of the actual work burden on a woman.

For assessing the access of women to information, training and extension services in two situations namely irrigated and rainfed in Orissa and **to test an alternate gender sensitive extension model** a benchmark study was carried out**.** Pre-seasonal training was organized for Village Level Para Workers (men and women) on need-based

Training on women friendly improved farm tools and equipment to farm women in village

areas in farming and home management to promptly address the farming problems of men and women. The para workers were trained to organize extension activities and promote women's participation in farm enterprises, income generation and nutritional security in agriculture. To secure participation of women sensitization programmes and thirty nutritional gardens, two fish culture units, one ornamental fish production unit and three mushroom units were developed involving participatory approach.

Demonstrations were conducted on yield maximization of ginger and groundnut, preparation of seedbed, soil treatment, seed treatment, sowing of seeds, mulching, eco-friendly technologies for the management of brinjal shoot and fruit borer (*Leucinodes orbonalis*) and tomato fruit borer (*Heliothis armigera*) for **Technological empowerment of farmwomen for family sustenance.** Special training programmes were conducted on production of straw and oyster mushroom, value added products such as squash from ginger and lime, blended squash and pickle and preparation of *sagu papad* and *suji papad*.

The data on the **Entrepreneurial status of SHGs** revealed that majority of group members belonged to the agricultural families with marginal land holdings. Most of the SHGs, however, existed for a long time without involvement in any enterprise. Their interests and preferences for skill training were assessed and skill development training programmes were organized on vermi-composting and bee-keeping.

The study under **Mechanization of rice sector and impact on gender** indicated that most of the mechanization was adopted in man dominated tasks while in women related tasks mechanization was not found adopted. The extent of mechanization of activities varied with farm-specific factors such as number of draught animals, size of work force in family, size of farm, location of farm, availability of non-agricultural income and external factors

SUCCESS STORY

Ornamental fish production—a new avenue for supplementing farm income

The National Research Centre for Women in Agriculture, Bhubaneshwar, developed a simple and cost effective ornamental fish production technology for resource poor rural women using indigenously developed infrastructure. The primary aim was to enable women utilize their spare time productively to earn some income.

The technology consisted of locally available earthen tanks of 50–60 litres capacity that are commonly used by women in traditional method of rice parboiling. The tanks were slightly modified to make them suitable for ornamental fish culture.

Ornamental fish production units (12) were developed in a cluster in Nimapara block of Puri district of Orissa. Each unit had 10–12 earthen tanks and reared two species one each of guppys and mollys. Training programmes were conducted on fish rearing and aquarium setting. In the beginning, women faced marketing problems that created doubts about sustaining the production. To overcome an educated unemployed young man from a nearby village was associated with the programme to help in marketing of ornamental fishes. He was also trained in the fabrication of aquarium tanks and setting so that he can help in creating market in the nearby areas. The above strategy was successful. It not only enabled the youth earn a monthly income of Rs 3,000 but also ensured the rural women a better price and returns for the ornamental fish produced by them.With a total investment of Rs 2,000 in a year (including establishment and recurring cost) a unit could generate on an average income of Rs 560/month. Similarly, an investment of Rs 5,000 could generate a monthly average income of Rs 1,400.

The institutional arrangement encouraged women to expand their units by adding more number of tanks and has motivated the other women groups of the area to start similar ventures using the low cost technology.

Organization of ornamental fish production units at village level

such as availability of machines in village/locality, cost of hiring the machines and diversion of the equipment for non-farm work. The process has led to displacement of men workers, and an average number of working days lost for wage labourers due to mechanization of land preparation and threshing was 26.5 days and 18.6 days respectively. In Orissa mechanization of threshing generated additional employment to women displacing men.

Training of farmers and farm women

Farmwomen (286) were trained for skill development in (i) insect pest management of vegetables nursery, (ii) vermicomposting, (iii) value addition of lime and ginger into squash, blended squash and pickle, (iv) preparation of *sagu papad* and *suji papad*, (v) oyster and straw mushroom production, and (vi) bee-keeping.

Two hundred farm women from the villages of Nipania Jat, Adampur, Dobra and Sagoni Kala of Bhopal districts were trained on improved tools and equipment, viz. hand ridger, seed treatment drum, fertilizer broadcaster, seed drill, CIAE wheel hoe, PAU wheel hoe, grubber weeder, hanging type cleaner and sitting type decorticator, and one set of these equipment was kept in each village for their use. Training on repair and maintenance of these equipment has also been imparted to 14 farm women from these villages. The performance of the implements is being evaluated.

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