



Gender Mainstreaming through

Integrated Farming Systems: Success witnessed under Farmer FIRST project in Uttar Pradesh

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Gender mainstreaming through IFS is necessary not only due to the extent and importance of their contribution but also for ensuring creation of equitable economic and social progressive opportunities and building capacity of the large human capital (women) supporting agricultural production, marketing and consumption. Gender mainstreaming has been identified as one of the key strategies and accordingly several interventions have been designed as part of the project with a view to empower women through IFS. It includes formation of women's Self-Help Group (SHG), processing, value-addition, trainings of farmers including women farmers, demonstration of improved small farm tools and implements etc. that has helped farmers in improving their livelihoods, labour productivity, family nutrition, overall social and economic empowerment.

Keywords: Equitable economics, Gender, Integrated Farming System

ICAR's Farmer FIRST scheme was implemented by ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut to understand the constraints and disadvantaged situations experienced by farmers including women in adopted villages of Western Plains of Uttar Pradesh. Consequently, exploring pragmatic solutions for leveraging IFS intervention supporting both men and women. Gendered study on anthropometry revealed wasting and undernourishment more in female children whereas stunting was more amongst male children. Wasting and stunting as strong predictor of food insecurity and food diversity respectively. Around 90% male children and 87% of female children <5 years of age were found stunted whereas about 13% male children and 19% female children <5 years of age were found wasted. Apart from that women supply 35% of labour in crop production activities, whereas 69% of family labour in livestock production activities. Women are either working manually or are left to use traditional tools and procedures resulting in low efficiency, drudgery, occupational health risks, leading to low labour productivity and income. Illiteracy, lack of knowledge among rural women, improper training, and less opportunity for skill development worsen their subdued existence.

Impact of gender responsive IFS interventions

Ensuring food and nutritional security through gender responsive IFS interventions: Livestock including milch animals, Nutritional kitchen gardens are managed primarily by women. Gender responsive technological interventions and capacity strengthening programmes for both men and women were conducted in nutrition management of dairy animals by making them aware about important role of mineral mixture



Dual purpose poultry bird for income and household nutrition

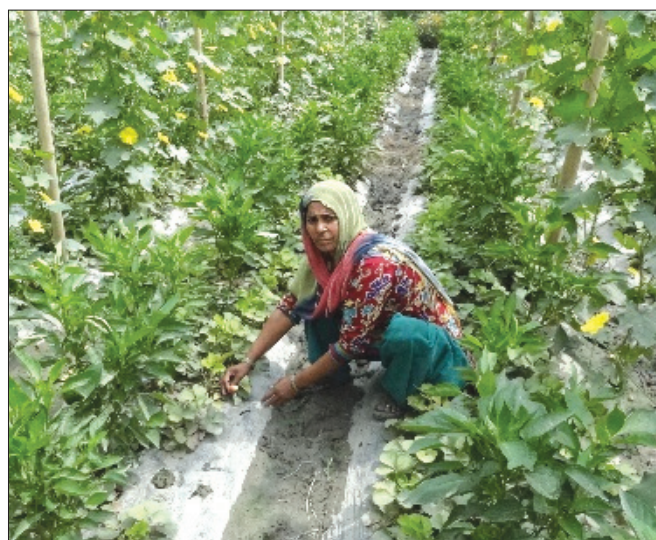
Table 1. Effect of capacity building and gender responsive interventions on nutrient yield per capita per day

Gender responsive IFS interventions	Proteins (g)	Iron (mg)	Calcium (mg)	Folic acid(µg)	Vitamin A (µg)	Vitamin C (mg)
Nutritional Kitchen Gardening (Spinach, Cabbage, Carrot, Radish, Okra, Brinjal, Broccoli, Chilli)	16.17	5.56	338.90	281.7	6782 (β carotene)	288.6
Livestock based intervention	35.53	2.22	1509.9	80.14	2196.4 (retinol)	11.96
Potential % RDA	86.16	45.76	308.13	180.92	141.2 (β carotene) , 366 (Retinol)	751

supplementation and availability of quality green fodder which could contribute towards better livestock health and increased milk production. Landless, marginal farmers including women farmers were provided with backyard poultry (Kadakhnath and RIR) both dual-purpose bird, i.e. for egg as well as meat, procured from CPDO, Chandigarh and introduced for supplementing their income besides nutritional improvement of family.

Similarly, women were benefitted with nutrition awareness programmes for securing their household nutrition supplemented with distribution and demonstration of nutritional kitchen gardening kits. They were motivated to utilize their home spaces for home gardening. Updating knowledge, technological interventions through gender response mechanism have amplified women's abilities to secure nutrition and livelihoods for their families. These interventions resulted in improved nutritional inflow into the farm family (Table 1). It has been reported that gender responsive IFS interventions potentially supplied 86.16% of per capita daily requirement within the household, 45.76% iron requirement, 308.13% calcium requirement, 180.92% Folic acid requirement, 377% Vitamin A requirement and 751% Vitamin C requirement.

Drudgery reduction, improving efficiency and gain in labour productivity through gender sensitive tools: Gender inclusive capacity building of individual farmers and farming community to reduce the knowledge gaps through drudgery reduction module by using gender sensitive tools was planned and implemented under



Nutritional kitchen gardening and vegetable cultivation

the project. Improved gender sensitive small farm tools/ implements with efficient ergonomic efficiency were promoted among women farm workers for different agricultural and horticultural activities for drudgery reduction. Gender sensitive improved tools (Table 2) have been demonstrated to increase their efficiency, productivity and comfort during harvesting and weeding. Farmers were provided and demonstrated the ergonomically designed instruments such as improved sickles for harvesting field crops, fodder crops, and improved khurpi for intercultural operations.

Eight hundred farmers including women farm workers have been benefited with improved sickle for harvesting field and fodder crops, as well as an improved khurpi. Improved equipment saves time and energy. Around 18.7% reduction in terms of time and 10.89% reduction in terms of energy has been recorded after working with an improved sickle compared to a traditional sickle. In contrast, around 80.4% reduction in time and 12.3% reduction in energy has been recorded while working with a direct seed dibbler. Gendered labour productivity has also improved on an average to the tune of 300 to 700 ₹/ha/yr after intervention due to the use of labour and time saving improved hand tools (improved sickle, improved hoe etc) in labour related activity. While in kitchen gardening, these small scale interventions without much addition of labour (only 3–5 additional mandays per year due to the use of improved tools, viz. sickles, wheel hoe, hand hoe etc), significantly

Table 2. Demonstration of gender sensitive tools

Intervention	Villages covered	Area covered (ha)/ Animal (No).	No. of Households covered
Demonstration of seedling transplanter	One (Bhayangi-Bhangela)	200 m ²	140
Demonstration of direct seed dibbler	One (Bhayangi-Bhangela)	200 m ²	140
Distribution of improved sickle for harvesting of field crops, fodder crops and improved khurpi	Three (Bhayangi-Bhangela, Sathedi, Sontaj)		800

Table 3. Income generation by women's SHG through secondary agriculture module per annum (2018–19, 2019–20, 2020–21)

Secondary agricultural Module	Average quantity production (kg/No.)	Mean cost of production (₹)	Mean gross income (₹)	Mean net income (₹)
Processing of spices (Turmeric, coriander powder, chilli powder, ginger paste etc.)	480	38200	88800	50600
Processing of wheat/rice/millet (Gram flour, rice flakes, maize flour, wheat porridge, mixed flour, pearl millet flour and biscuits, vermicelli etc.)	476	32230	85680	53450
Processing of fruits and vegetables (Mango, lemon, chilli, aonla pickles, guava based mixed jam, blended squash, water chestnut flour etc.)	525	41626	118125	76500
Handicrafts, garments and masks	250 No.	28200	54300	26100
Total	1481 kg /250 No.	140256	336905	206650
Benefit : Cost ratio		2.40		

helped in improving household nutrition by availing diversified vegetables and green leafy vegetables for household consumption through nutritional kitchen gardening.

Mobilization and organizing: creation of and support to self-help group: Women make invaluable contribution to agricultural process, family income, food security and ensuring sustainable livelihood for the families. The initiative of creation of self-help group of women in Satheri village (Devanjali Mahila Samuh) under Farmer FIRST has provided a platform to women to increase their abilities in secondary agriculture activities as a source of income. The basic purpose of formulation of SHGs was to financially empower the farm women which could potentially lead to other collective opportunities and activities, creation of assets and control of resources by them. Other women also got encouraged and motivated by SHGs and have used this opportunity to learn and build their capacities.

The women's group were imparted different training programmes on value-addition and processing of various items. The group has gained expertise in the development of different products, viz. blended squash (guava + orange) and mixed jam (guava + apple + aonla + orange + persimmon) (guava + pineapple + pomegranate + apple), and ginger paste, etc. The mixed



Awareness training for women farmers

jam and ginger products were packed into glass bottles, and blended squash was packed into PET bottles. The group also gained expertise in the processing of spices, cereals, millets, fruits, vegetables, sugarcane into different value-added products, viz. turmeric, coriander, powder, chilli powder, ginger paste, gram



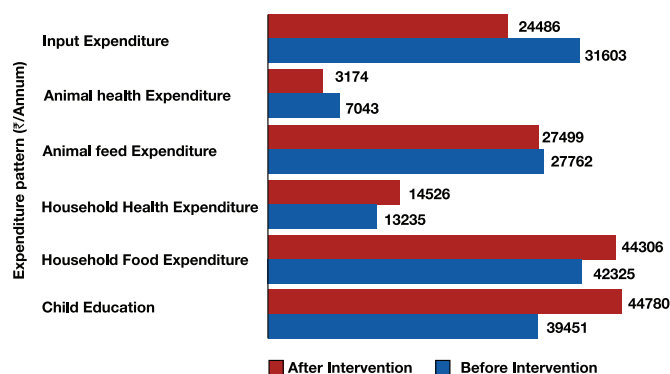
Marketing of different value added products through different exhibitions and Farmer Fairs by SHG

flour, rice flakes, maize flour, wheat porridge, mixed flour, pearl millet flour and biscuits, vermicelli, mango, lemon, chilly, aonla pickles, guava based mixed jam, blended squash, water chestnut flour, nutritionally enriched jaggery production, etc. Besides that, they've been provided knowledge and skill about packaging various products using various packaging materials. By selling the created items at various exhibitions, farmer fairs, door-to-door marketing, order on phone calls, and other venues, the organisation has obtained experience in branding, labelling, marketing, and preserving sales records. The group has developed 1481 kg of processed products and 250's of handicrafts, masks, readymade garments by selling various value-added products and earned ₹206650 per year as net revenue. In addition, the organization has gained experience in marketing and keeping track of sales for developed items. The profit margin (30%) on the sold products was split equally among the women. Benefit : Cost ratio was observed to be 2.40 (Table 3).

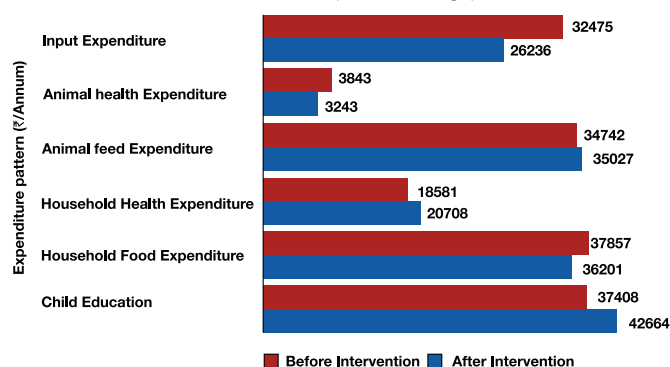
Overall impact of gender sensitive interventions on expenditure pattern of household

Study conducted on 120 sample households from two adopted villages, i.e. Satheri and Bhaingi-Bhanegla out of the total 1036 households from Satheri, Bhaingi-Bhangela and Sonta village in Muzaffarnagar where benchmark survey was carried out revealed significant improvement in expenditure pattern (₹/annum) before and farming system interventions of households due to gender sensitive intervention in farming systems mode.

The results indicated that the women invest as much as 10 times more of their earnings than men do in their family's well-being, in areas including child health, education and nutrition. Women's empowerment thus has a direct impact on agricultural productivity and household food security. Data shows that the expenditure on child's education has increased by around 5000 ₹/annum in both the villages, whereas food expenditure was reduced in Bhaingi-Bhangela village due to the farming system interventions but was improved in Satheri village farmers especially landless category (51.50%) started spending the additional income got through farming system interventions into more nutritious and diversified diets. However, the share of food expenditure has been reduced by 1.8% after interventions in Satheri village followed by 1.5% in Bhaingi-Bhangela village due to the increasing availability of cereals, legumes, oilseeds, vegetables, milk, meat through farming system interventions. Similarly, increased expenditure of around 1000 ₹/month on human health was noticed in both the farming systems due to the additional income generation and awareness programmes. Apart from that, expenditure increase on animal feed was not significant after interventions due to steady supply of green fodder as well as awareness regarding low-cost balanced meals using the available feed components. In addition to this, animal health expenditure was observed to be significantly reduced



Expenditure pattern (₹/annum) before and farming system interventions (Satheri village)



Expenditure pattern (₹/annum) before and farming system interventions (Bhaingi-Bhangela village)

due to increased awareness about animal health and management practices followed for animal health. Expenditure on input was also significantly reduced by 6000 to 7000 ₹/annum in both the villages due to awareness creation regarding the ill effects of imbalance use of fertilizers and application of integrated nutrient and pest management practices.

SUMMARY

The recognition of the need for gender mainstreaming and empowering women by leveraging male and female differences in the area of farming systems management and production leads to improved family nutrition, occupational health of women, children's education and health, increased labour productivity. The effectiveness and sustainability of gender responsive interventions is crucial for their contribution in attaining the Sustainable Development Goals of gender equality, food security, alleviating poverty. Apart from that equalizing access to farming systems productive resources through eliminating male and female differences facilitates women in achieving more power over their lives which can further change lives of their families and whole communities. Creation of SHGs of women in villages through mobilizing women is the first step towards the pathway of awareness generation to employment to empowerment.

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