

# Cafeteria of intercrops in Coconut gardens

## Women farmers' community based success story

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Coconut gardens are ecological units of integrated systems providing environmental and livelihood opportunities. Most of the coconut gardens in general are small and marginal holdings, following homestead patterns customized to the farm family, food preferences, major income sources and resource base of the farmer. Research and extension interventions warrant refinement and adaptations for effective delivery of results in achieving desired impact.

ICAR CPCRI Farmer FIRST Program (FFP) started in 2016 is being implemented at Pathiyoor panchayat, Alappuzha district, Kerala state. The major objectives were interventions for participatory technology integration to empower and ensure livelihood security of farmers/farm women. The major problems identified in the location were:

- Poor or average management of coconut and other crops in homesteads
- Non awareness and non adoption of HYV of inter crops in coconut homesteads

- Lack of access to advisory services and extension support
- Absence of processing and value addition of farm produces
- Poor extension advisory support and field services
- Very low level of knowledge and skills on technologies
- Absence of farmer organizations or groups active in the panchayat

### ICAR CPCRI Farmer FIRST Program (FFP)

Farmer FIRST Program is a national flagship program of Indian Council of Agricultural Research (ICAR) in various states. Farmer FIRST (farm/farmer, Innovation, Resources, Science and Technology) program deals with participatory research and extension interventions in six modules. Technologies are generally recommended for crop based adoption by the farmers. But in the process of adoption umpteen factors are directly and indirectly related





along with extraneous variables as indicated in several reports and studies. This warrants for appropriate refinements and adaptations of the technology *per se* with research based support and process documentation models from social science researchers and field functionaries. These will be influenced by the farmers' choices of crops, resources and inputs, attitudes, social compulsions and consequences, field experiences, situational attributes and cultural factors. The scope for integration of innovations with recommended technologies improves the ownership and acceptance among farming community. The modules are Crop, Horticulture, Livestock, Natural Resource Management (NRM), Entrepreneurship development and Value addition and Integrated Farming Systems (IFS). The modules can be selected as per the location specific objectives. The FFP is fully funded by ICAR and ICAR CPCRI initiated interventions in Pathiyoor panchayat since 2016 onwards and is continuing.

### Coconut homesteads and cropping system- Overview before FFP interventions

The Farmer FIRST Program (FFP) pre project survey in Pathiyoor grama panchayat, indicated that majority of the land holdings were 25-100 cents (0.1 –0.4 ha category). The study involved 740 sample farmers. Farmers having landholding size of 10 cents and below were 16.1% , 11 – 25 cents (29 %), 26 – 50 cents (24.8%), 51- 100 cent ( 20.6%), above 1 acre (8.7 %). This scenario indicated the appropriateness of group or cluster farming in overcoming the probable low level market surplus in production. The results also showed that rain fed cultivation rules the farming situation with very low adoption of irrigation methods. Location specific farm planning and situation specific, decentralized policy making may have to look into and evolve strategies for community and area based water conservation

and irrigation methodologies. One of the notable points of homestead gardens was the adoption of small vegetable gardens. It is encouraging to note that 71 percentage of the sample farmers adopted vegetable gardens for their own home consumption, which guaranteed fresh and organic vegetables to the family. Almost 11 per cent of the farmers were reported to produce, marketable surplus besides home consumption. Only 18 per cent of farmers are not adopting homestead vegetable gardens, as per the sample survey. The data showed the need for extension advisory services to adopt scientific interventions for better output from unit area. The inter cropping in coconut gardens are constrained with climate change problems of untimely and heavy rains, flooding and long spells of summer season. The major pest and disease problems were rhizome rot of ginger, fungal diseases in turmeric and colocasia, severe nematode problems in amorphophallus, stem borer in ginger and turmeric, aphids in pulses, rat and crab attacks in vegetables of low lying areas, white rust and leaf spot in amaranthus, fruit fly in cucurbitaceous vegetables etc. Other general problems were labour shortage and high cost of laborers, lack of social mechanisms for equitable distribution and information on government projects and support system, reduced soil-fertility, low profitability in farming and acute water scarcity during summer seasons. The major intercrops in Pathiyoor panchayat were tubers, vegetables, turmeric/ginger, and banana in very small plots for home consumption mainly.

Field visits and survey in Bharanikkavu grama panchayat, Alappuzha district also indicated similar status regarding intercrops in coconut gardens. The major inter crops were tubers, spices, banana and vegetables in small scale mostly for home purpose with modest market surplus in some gardens. The selection criteria for inter crops were mainly family preferences, food consumption behaviour of family members and interest in involvement and economic conditions. Approximately one fourth of the farmers only adopt inter cropping in their coconut gardens. This requires serious interventions, since diet diversity, ecological factors and food production are major concerns. Coconut based homesteads are classic models in achieving goals of eliminating hunger and hidden hunger, as well. Generally the coconut based homesteads of root (wilt) disease affected areas are varied widely in terms of age of palms, resource base, management adoption and requirements.

## Extension strategies in FFP for improving inter crops in coconut gardens

Extension support needs social process documentation and evolving workable models through action research for crossing the chasm in technology adoption and improving the use and impact of research in farmers' fields. The participatory strategies evolved through field level action research involving peoples' representatives, progressive and small/marginal farmers, women farmers groups and other stakeholders. The points of successful action in the FFP were as follows:

### **1. Convergence with MGNREGS in the panchayat as an innovation in technology dissemination and area wide adoption.**

MGNREGS can be effectively integrated with local resource based agricultural plan and implementation as demonstrated successfully in the Farmer FIRST Program since 2016 onwards. The land consolidation process was necessitated as a responsible extension intervention for promoting women MGNREGS participants, of whom 88.44 percent had less than 0.08 hectares of land. Through the land consolidation approach, 354 acres of fallow land were brought under cultivation each year, during 2017-20 under various crops. The fallow land as inter-spaces in coconut gardens were consolidated contiguously in discussion and consent of coconut farmers and convergence farming plans were submitted to Rural Development Department through Grama panchayat MGNREGS section. The planting/ seed materials of HYV procured linking with various Agricultural Universities and provided by ICAR CPCRI FFP free of cost initially. The varieties were screened for suitability in the area and acceptance among farmers through participatory evaluation process.

### **4. Area spread of HYV through convergence interventions**

The area spread and adoption of HYV of intercrops were achieved through the joint identification of contiguous area of minimum one acre for each crop in ward basis. The joint effort of peoples representatives, women SHG farmers, other farmers and stakeholders was through discussion with land owners, obtained their mutual consent and identified contiguous areas for crops and technologies like High Yielding Varieties (HYV) of inter crops. The cultural management of the perennial base crop, coconut in the consolidated lands, was also included under the interventions by women labourers voluntarily. A crop calendar was prepared after personal field visits by a team of experts from ICAR-CPCRI, Regional Station, Kayamkulam, in consultation with farmers. Hence an action plan for the area to be cultivated, HYV varieties to be introduced from institutes/ Universities, human and other resources needed for technology adoption, and interventions for rapid area spread, were documented for MGNREGS and FFP convergence. The action plans were vetted with the concerned administrative units.

The farming community demanded that participatory micro planning of agricultural schemes or interventions be developed based on the diverse local problems or situations. We have learned that the 19 wards of Pathiyoor panchayat had different problems – land-based issues (flood prone, soil nutrient status, and fragmented land holding size), and other concerns such as crop suitability, integration choices under the integrated farming system (IFS), very low income from farming, lack of a value chain, socio economic variables – and low involvement/ leadership of local people's representatives. Agricultural extension interventions in FFP, can lead





to holistic and broader empowerment of the lower most farmers or labourers through participatory micro planning of activities in the panchayat. This called for sequential extension interventions based on emerging needs, facilitating specific problems, equitable and transparent transactions/critical input provision, addressing failures and sustaining successful models, in a proactive and farmer-driven mode.

#### **5. Breaking barriers of potential yield attainment in niche crops**

The farmers were not aware of or aspiring for obtaining potential yield of intercrops or any crop they cultivate. The farm planning must include the potential yield to be realized as per the soil type and fertility status, knowledge and adoption potential of individual and group of farmers, resilient approaches, extension advisory services, competence and field orientation of extension field functionaries and the decentralized vision of grama panchayats in food production and conservation and management of natural/human resources efficiently sustainable. The potential yield of varieties of crops in coconut based inter-cropping system varies with locations and deviates from research results as observed in FFP cases. Hence demonstrations among small and marginal coconut farmers needs to be farmers participatory in a contiguous area, mutually observed and evaluated by experts and farmers. The breaking barriers in achieving potential yield can thus be demonstrated and learning occurs across farmers. This approach critically enables them in adopting technology combinations to economically integrate and profitably sustain.

#### **6. Procurement mechanisms for surplus production**

The production of intercrops improved due to group cultivation and adoption of HYV under scientific management. The readily edible produces could get neighbourhood markets, since the sources of production are known and consumers prefer farm fresh. Procurement plans and processing mechanisms were in need for turmeric, coconut and sesamum in the first phase. This intervention was enabled through Odanadu Farmer Producer Company (OFPC) with ICAR CPCRI as the Producer Organization promoting Institution (POPI) with NABARD support.

#### **► Problems prioritized for women SHG for adopting inter cropping**

1. Access to land for farming is very low or nil

for landless /women

2. Technology based agricultural activities in MGNREGS was absent

3. Access to knowledge on farming and farming skills were only traditional based.

4. Linkage or communication with scientists / researchers was absent

5. Income enhancement through technology adoption, skill / knowledge empowerment in agriculture got feasible potential

### Social approaches in FFP

1. Land consolidation for farming by the women SHGs in MGNREGS for crop / horticulture/ NRM modules of FFP interventions. The fallow inter spaces in coconut gardens of farmers of respective wards were shared free of cost on a mutual social agreement facilitated by ward members (people's representatives) and women SHG leaders.

2. Training programmes, linkage with MGNREGS units of the panchayat, regular and frequent visits, whatsapp group for problem solving, method demonstration of each farming unit, support with HYV crop varieties / critical inputs.

3. Women SHGs were made partners in participatory evaluation/ experimentation of various modules.

The impact of the convergence process is not only reflected in the area spread of HYV but also in income enhancement and creation of technical assets.

- A total of 354 acres of farm land were consolidated for FFP intervention in convergence with MGNREGS across 19 wards of Pathiyoor panchayat. The panchayat was declared as 'fallow free' by the Haritha Keralam initiative of Kerala State indicating success of the interventions.

- Technical impact of women MGNREGS beneficiaries from FFP convergence were mainly in the form of access and participation in agricultural training programmes.

- In spite of the efforts, all the women participants could not attend the training sessions. This gap was filled by key farmer experts and mutual exchange of information within and among the women groups. It was observed that overall 64.33 percent of participants gained practical knowledge and skill in farming. Almost 70 per cent of the women farmers could attend training programs in off campus mode in their fields. The maximum number of training programs they could attend was 21 by

1.38 percent and 44.44 per cent attended more than 5 trainings in a year.

- Technologies identified for imparting training are on: cultivation of high yielding varieties (various crops), appropriate spacing, bed preparation, application of chemical fertilizers, cultural operations, plant protection measures, harvesting and post-harvest, and value addition, use of ICT, climate resilient practices, skills in small machinery use and marketing;

- The training programs were scheduled as on-farm sessions, at the respective work sites, apart from off-farm sessions for group leaders for developing them as key farmer experts. This change in training mode enabled modifying the curriculum as per emerging needs at the field level.

- Almost 97 percent of the beneficiary women farmers adopted more than three technologies, viz., high yielding varieties, spacing, chemical fertilizers and organic inputs for plant protection.

- The productivity or yield improvement as perceived by women farmers indicated that, even though 5.56 percent perceived lower yield, majority (94.44%) could get 30-50 percent more yield due to adoption of good agricultural practices and high yielding varieties after the interventions.

- Indirect impact was on improved diet diversity among the families of the beneficiaries as a result of growing diverse crops, including millets and vegetables, and sharing of excess production equally by all the group members. This also improved the willingness and involvement of family members in farming activities of the groups.

- The most visible impact was the value addition units for coconut, turmeric and finger millet in the panchayat so as to utilize surplus production. Five rural youths established small enterprises for processing and marketing of turmeric powder, sesamum oil and coconut oil under the 'Pathiyoor Farmers' brand.

### Ensuring additional investment in agricultural interventions

ICAR-CPCRI FFP faced constraints in getting adequate quantity of HYV to be introduced. The suitability of the varieties or crops in the location was also a question begging answers. Participatory evaluation of HYV/crops introduced were planned and executed with participation of 25 percent of selected women MGNREGS groups. The supervision and monitoring of this important step was entrusted



composted, through method demonstrations and trainings, thus reducing the costs of organic inputs

### Lessons learned

The Responsible Extension Approach (REA) evolved for quality planting material production facilitation by scientists can achieve area spread of new varieties in the following steps.

- Forming social responsible groups comprising agricultural experts, local people representatives, women SHGs for cultivating, progressive farmers and representatives of general public is necessary for REA interventions.

- Cultivation in identified contiguous area through land consolidation and convergence with MGNREGS can expand the farming area with effective labour

- Technical facilitation by concerned ICAR Institute and FFP team, supervising is mandatory and regular field visits, training programmes before and during the activities.

- The groups initially formed for the further production of planting material also have to agree with the memorandum of understanding (MoU) and the varieties could be spread to all the 19 wards of the panchayat in a responsible and rapid way.

- The responsible extension strategy enabled knowledge and skill on the varieties and the planting materials among women farmers and coconut farmers is inevitable. This can effectively surpass the usual technology demonstration and OFT through social consensus and conviction.

- The percentage increase in yield of the crops compared to the check varieties can be easily achieved when the coordinated works in the field level is systematic and timely. ■

to a sub-committee of women group leaders, people's representative of the location, scientist and retired technical persons from Department of Agriculture, Rural Development, and farm clubs of the locality. The first batch of planting materials/seeds of released HYV were procured directly from the relevant research institutes and provided free of cost to 25 percent of groups as a starter quantity. Sharing of additional investment was agreed upon among group members and between groups besides sharing of quality planting materials. Chemical fertilizers and plant protection chemicals were provided from FFP on a 60:40 ratio, 60 per cent by FFP and 40 percent shared by women's groups. Organic manure (FYM) was collected locally from farm families. Burning of cleared weeds and organic residues were positively converted to recycling, mulching materials and