

Enhancing farmers income

through ICAR-Farmer FIRST Programme

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The project entitled “Socio-economic empowerment of farmers through farming system interventions for sustainable agriculture development in Ahmednagar District” under ICAR Farmer FIRST Programme is being implemented by MPKV, Rahuri in two villages in Maharashtra, comprising 750 households. Based on the agro-ecosystem analysis, appropriate interventions in Natural Resource Management (NRM) were planned, and Integrated Farming System (IFS) components like pulses and cereals production technologies, horticultural crops along with dairy management, farm pond fishery, goat rearing and backyard poultry were implemented. On-experimentations conducted during 2016-19, showed encouraging results in crop production and increased net income to the participant farmers. On site input management was created in the village. Convergence of line departments resulted in up-scaling of innovations and technologies. The FFP has resulted in sustainable income enhancement for the farmers.

Key words: Convergence, Farmer FIRST Programme, Integrated farming system

FARMERS tend to face problems related to production and natural resource management but they may have no solutions to overcome them. Farmer FIRST (Farm, Innovations, Resources, Science and Technology) Programme bring the scope for the researchers, extension personnel and farmers to work together and find appropriate ways for assessing different solutions.

Concept of ICAR-Farmer FIRST Programme

The project entitled ‘Socio-economic Empowerment of Farmers through Farming System Interventions for Sustainable Agriculture Development in Ahmednagar District’ under ICAR-Farmer FIRST Programme (FFP) is to move beyond the production and productivity and to privilege the complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists contact with multi stakeholders participation.

Methodology

The project is implemented in Rahuri tehsil of Ahmednagar district covering two villages comprising 750 households during the project period in convergence mode with other developmental departments. The agro-ecosystem analysis was conducted in the project area through Participatory Rural Appraisal (PRA) techniques with active involvement of farmers and other stakeholders. Based on farming situation analysis, problems like inadequate *in situ* conservation practices (soil and water), biomass management, low soil fertility, improper nutrient management, low crop productivity, feed and fodder scarcity, low synergy and convergence were identified. Accordingly, appropriate interventions in Natural Resource Management (NRM) were planned. Based on ground reality and farmers views, the Integrated Farming System (IFS) was designed for the project area. Various IFS components

include pulses and cereals production technologies, horticultural crops along with dairy management, farm pond fishery, goat husbandry and backyard poultry.

Encouraging results of technology demonstrations on farmers’ fields

On-farm experimentations were conducted for solving different problems of the farmers under different components (Fig. 1.a-e) during 2016-19. They are presented below.

- The five point *rabi sorghum* technology resulted in 18.3 q/ha grain yield and 45.9 q/ha fodder yield to the farmers. Gross monetary return of ₹ 36,600/ha (grain) and ₹ 25,000/ha (fodder) was obtained by the participant farmers. The average cost of production was ₹ 27,000/ha. The *Panchasutri* technology viz., in situ soil moisture conservation, seed treatment with biofertilizers (Azotobactor, PSB), variety as per

soil type (seed), intercultural operations and Integrated Pest and Disease Management (IPDM) were demonstrated on 100 acre area.

- High iron content (81 ppm) pearl millet variety Dhanshakti (Fig. 1.b) was also demonstrated on 100 acre area. Gross monetary return of ₹ 73,200/ha with B:C ratio of 2.76 and average yield of 30.5 q/ha was achieved by the demonstrating farmers. The demonstrations included seed treatment with Phosphorus Solubilizing Bacteria (PSB), seed replacement and integrated pest and disease management.
- In pulses production technology experimentations, the chickpea variety *Digvijay* (Fig. 1.a) provided a net profit of ₹ 63,750/ha to the participating farmers. An average yield of 21.50 q/ha was obtained through these demonstrations. Gross monetary return of ₹ 96,750/ha was obtained through these demonstrations with average cost of production of ₹ 33,000/ha. The technology included broad based furrow (BBF) planting, seed treatment with biofertilizers like rhizobium and PSB, variety seed replacement, intercultural and integrated pest and disease management. An area of 50 acre was covered under demonstrations.
- In red gram demonstrations of variety *Vipula*, a benefit: cost (B:C) ratio of 2.81 was recorded on 50 acre demonstrations area. Gross monetary return of ₹ 85,500/ha was attained with an average cost of production of ₹ 32,000/ha. An average yield of 19 q/ha was obtained by the farmers. The technology package included variety seed replacement, seed treatment with *Rhizobium* and *Trichoderma* and plant protection.
- Application of liquid biofertilizers along with phosphorus and potassium solubilizing bacteria to Bhagwa pomegranate orchards (Fig. 1.c) in these villages will enhance the quality of fruits and ultimately the yield of



Fig. 1.a. On-farm experiment: Chickpea variety *Digvijay*



Fig. 1.b. On-farm experiment: Pearl millet



Fig. 1.c. On-farm experiment: Pomegranate orchard

pomegranate orchard. The 50 acre demonstrations resulted in average yield of 7.61 t/acre with average cost of production of ₹ 56,250/acre and gross monetary return of ₹ 400,801/acre.

- Net profit of ₹ 35,000/farm pond (Fig. 1.d) was obtained through

fishery (6,000 fingerlings of *Labeo rohita* and *Cyprinus carpio* species) in farm ponds excluding the average cost of ₹ 15,000/pond. Around 40 farmers participated in these farm pond fishery demonstrations. The farmers were guided on feeding management,



Fig. 1.d. On-farm experiment: Farm pond



Fig. 1.e. On-farm experiment: Backyard poultry

disease management and marketing skills.

- The landless population of these villages were supported through backyard poultry (Fig. 1.e). The Grampriya breed brought sustainable income to the landless and small, marginal farmers. Net income of ₹ 29,550/family has resulted in sustainable income for the landless through backyard poultry. Total average expenditure was ₹ 17,700/poultry unit on vaccination and feeding. Thus, these landless farmers in project villages generated a total income of ₹ 2,900,550 from 100 demonstrations. Egg incubators were established by the landless in the village for spread of the Grampriya chicks as a part of onsite input management.
- Value addition of pulses and other farm produce along with branding, packaging, market linkages and overall value chain management were planned under this project. Two PKV Mini Dal Mills were installed by the women Self Help Groups in these two villages through the ICAR-FFP. Now they have started earning from processed dal. In four months, one SHG could earn net income of ₹ 17,350 and other realized benefit of ₹ 10,815 from dal mill processing.
- Further, as per clientele cum partner research, the issues on horticultural crops, dairy management and other components of IFS approach were addressed through focussed group discussions, capacity building programmes, farmers' exposure visits, mobile advisory services and

farmers-scientists interactions.

- Various publications were brought out on demonstrating technologies for the benefit of participant farmers. Regular organization of the on and off campus training programmes have resulted in skill development of farmers. Advisory services are sent through the WhatsApp group created for the benefit of farmers. Exposure visits have resulted in confidence and knowledge gain by the participant farmers. Farmers and farm women were encouraged to participate in agriculture exhibitions to sell their produce. Success stories of these ICAR-FFP participant farmers were shared at different platforms for further spread of technologies.
- Finally, the outputs of these interventions have resulted in sustainable income enhancement of farmers which is in line with Govt. of India policy for doubling the farmers' income by 2022.

Success Story on Convergence

Name of Farmer: Shri Machindra Annasaheb Shete

Background information: Shri Shete is a graduate farmer from Chinchvihire village of Ahmednagar district. He is 37 years of age having a farming experience of 10 years. He owns about 8 acre of land which falls in rainfed area.

Problems: The Chinchvihire village falls in low rainfall area. This region receives an average rainfall of 500 mm per year and that too not well distributed. Majority of the soils are light to medium and low in organic carbon content. The farmer used to cultivate *bajra* crop in *kharif*

followed by *rabi* sorghum. The land used to remain fallow in summer due to unavailability of water.

Convergence leads to success:

With this cropping pattern and low yield of crops, he was not satisfied due to unremunerative returns. The Mahatma Phule Krishi Vidyapeeth, Rahuri, implemented the ICAR-FFP in Chinchvihire and Kangar villages from 2016-17. He came into contact with the university scientists. Simultaneously, he availed the farm pond scheme under the National Horticulture Mission (NHM) of State Department of Agriculture. As per the guidance of pomegranate experts of MPKV, Rahuri, he planted 6 acre (2,400 no. of plants) of Bhagwa pomegranate variety (Fig. 1.c) on his field. Hence, the convergence of MPKV, Rahuri and Agriculture Department made a way for the successful efforts of the farmer.

Successful implementation of the technology interventions

The farmer under the guidance of ICAR-FFP, scientists started implementing the planned interventions. He cultivated the pomegranate orchard at spacing of 12 × 8 ft. The size of his farm pond is 33 × 30 m with a depth of 30 feet and water holding capacity of 45 lakh litre (Fig. 1.d). The farm pond has been covered beneath by plastic mulching paper for avoiding water seepage. Seeing to the water scarcity, he has established a pipeline at a distance of 6 km from the Mula canal and stored this water in his farm pond for protective irrigation to pomegranate orchard. He has incurred a total cost of ₹ 12.83 lakh (including the subsidy) for

establishing pipeline to fill the farm pond, mulching paper and fencing of pond. The farmer has full faith in the university technology and hence he has made this huge investment. He is confident that he would recover the investment within 2-3 years from pomegranate production. He has also installed micro-irrigation for this orchard which would save irrigation by 50%. Further, the application of MPKV developed liquid bio-fertilizers like Azotobacter, Phosphorus Solubilizing Bacteria (PSB), Potash Solubilizing Bacteria (KSB) through ICAR-FFP were planned for his pomegranate production. He expects good response from these biofertilizers. He also applied other fertilizers as per the recommendation of soil health cards.

The next intervention was the introduction of fishery component in his farm pond. The farmer was updated on fishery through orientation training programmes conducted through ICAR-FFP. Besides, the visits of fishery experts and ICAR-FFP scientists, he decided to go for farm pond fishery to earn an additional income. Thus, fish fingerlings @ 6,000/ farm pond of *Rohu* and *Cyprinus* species were introduced in his pond. He regularly follows the feed management recommended by the experts and

remains in constant touch with the scientists to solve his farm problems.

Dairy business plays an important role in the rural economy. The ICAR-FFP of MPKV, Rahuri primarily focus on the IFS of the farmers. The farmer owns six cows of HF breed on his farm. He has gone for the artificial semen straws of HF breed for higher milk yield in successive generation. Besides this, he has planted the MPKV developed Phule Jaywant fodder which has high protein content.

Versatile farmer: The farmer participated in the Farm Innovator Meet organized by the ICAR-ATARI, Pune at Krishi Vigyan Kendra, Baramati in October 2017. He shared his experience with the farmers and scientists during the meet. He is also a member of the MPKV-ICAR-FFP WhatsApp group and effectively utilizes it for advisory services and problem solving with the university experts. He updates his knowledge by regularly participating in the on- and off-campus training programmes. Besides, he participated in the farmers exposure visits and study tours to Hivre Bazar, Ralegan Siddhi, Sahyadri Farmer Producer Company at Nasik and KVK, Baramati. Many ICAR and SAU authorities have visited his farm and appreciated his efforts.

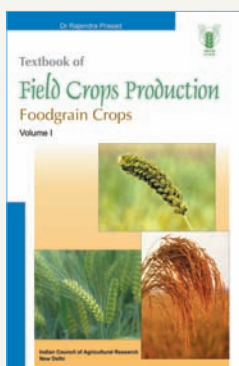
Expected monetary returns: The farmer has implemented all these interventions in IFS mode through the FFP. His pomegranate orchard is in fruit initiation stage. He is expecting minimum gross return of ₹ 25-30 lakh from his six acres pomegranate orchard this year. The gross income from fishery was ₹ 0.50 lakh. He got a net income of ₹ 0.35 lakh from farm pond fishery. Thus, an innovation/technology hub for upscaling of interventions has been created in Chinchvhire village, where many farmers have visited this model and adopted on their fields. The farmer proudly accounts this success to the MPKV implemented FFP.

CONCLUSIONS

Convergence of research institutes and line departments is essential for upscaling of innovations and technologies. The integrated farming system module will enhance the farmers' income and add to his income. Thus, the experiences of MPKV implemented ICAR Farmer FIRST programme has resulted in sustainable income to the farmers.

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