

Improving livelihood security

of farmers through technological interventions
for sustainable livestock farming

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Location and selection of area

The project was initiated in 3 villages (Lakshmidhevipura, Thimmajanahalli and S. Nagenahalli) in Doddaballapur Taluk, Bengaluru district, Karnataka. Average annual rainfall is 800 mm. Most of the underground water is often depleted due to low rainfall. Majority of the farming is rainfed, whereas very few farmers had irrigation source as borewell. The major cereal crops grown are ragi, jowar, maize and bajra; vegetable crops like tomato, beans, a few grape-vine yards; and fodder crops like ragi, maize, jowar and redgram.

The rationale behind selection of the project villages is the huge potential in milk production, grains (ragi and pulses) apart from fruits and vegetables, whereas earlier only ragi-pulse/ragi mono-cropping system was followed. The area is enriched with natural resources, however resources have been underutilized due to lack of awareness and not proper utilization of working knowledge of the people. The villages are near to the potential market of Bengaluru City and ICAR-NIANP and other collaborating institute scientists could regularly visit the villages for continuous monitoring of the interventions.

Number of farm families

A total of 500 farm families

have participated in the project.

OBJECTIVES

- Enhancing productivity, income and profitability of the households through technology translation.
- Building a network of linkages of household with multiple agencies like technology institutions, input support system, market etc.
- Integrating economically viable and socially acceptable entrepreneurial activities as models of enhanced earnings to the farmers.

INTERVENTIONS

The interventions carried out in this project were target specific and as per felt need of different category (landless to large farmers category) of beneficiaries and as per available resources and working knowledge of the people. In all the households covered, the interventions either singularly or in combinations are being implemented for doubling

their income. The total area under direct implementation of crop or horticulture interventions is 128 ha. The total area of 869 ha is under the FFP directly and indirectly through livestock, poultry, procurement of farm products, outreach programmes through linkages and convergence with FFP team.

Horticulture based module

Small and marginal category of farmers are beneficiaries of this module. The main focus was given on promotion of improved vegetable varieties through demonstrations and comparing with existing cultivar in both quality and yield. The horticultural crops were cultivated mostly as intercropped with main crops and also multiple cropping methods were followed in a contiguous manner. The core hassles identified were about the lack of knowledge about HYV crops and its package of practices. In addition, they were unaware of economic importance in the market about horticulture crops. The technologies introduced were HYV's of vegetables evaluated through participatory experimentation and they were ranked as most suitable to the local condition with high yield and acceptability.

The approach evolved for quality planting material production facilitation by scientists could achieve area



Mrs. Nagarathamma in her cowpea field.

spread of new varieties. Social responsible groups were formed comprising agricultural experts, local people representatives, women SHGs for cultivating, progressive farmers and representatives of general public for interventions. An MoU with the group to provide quality plant materials free of cost for a area spread to other wards to a maximum of 40% of their total harvest. The percentage of increase in yield of HYV crops were compared with local varieties, which showed 47% increase in Tomato while beans, okra, spinach, chilly, bottle gourd showed an increase of 25%. On an average there was 70% of increase in the net returns of farmers.

Crop based module

This module was followed for large farm categories who usually follow ragi-maize-bajra cropping system. The major problems prioritized in the crop based modules were the low level of adoption of high yielding varieties of crops and subsequently low production and low income. Soil sample collection was done and samples were analyzed, based on which nutrient recommendation and crop planning was done. Accordingly, two improved varieties of Ragi (ML 365) and Redgram (BRG 5) were recommended by experts from NBSS&LUP and GKVK. These varieties were introduced and they performed much better than local varieties and resulted in better yield and net returns. After seeing the visible results, more farmers now demand for the variety. Improved varieties of Ragi (ML 365) and Pigeon pea (BRG 5) was introduced. BRG 5 has a yield of 15-16 q/ha and is wilt resistant. ML 365 has a yield of 35-36 q/ha and has a better straw yield.

Livestock based module

Cow mats were distributed to



Mastitis Management Module.



Mr Shivaraj, in his fodder plot CoFS-31. Area under fodder expanded to the extent of 410% during the project period.



Chaff cutter installed at milk society.

reduce lameness, which accounted for 62.5% of reduction in veterinary expenses. Animal Health and Fertility Management were carried in regular intervals to treat repeat breeders along with normal health check up of animals, 75% of repeat breeding animals were completely cured by

regular treatment. Area specific mineral mixture was given to upsurge fat level in milk which attributed for 2.5% increase in milk yield. California Mastitis Kit (CMT) was provided to keep a check on occurrence of mastitis since the first stage along with trisodium citrate and pre & post dip were given to control mastitis as a precautionary measure, where, all these efforts have accrued for 83% reduction in veterinary expenses and 2.5% increase in milk yield. A CoFS-31 of multi-cut variety fodder seeds was introduced among farmers along with preservative technique like silage and growing of hydroponics using locally available materials and azolla was given to increase the yield of milk.

Enterprise based module

Seventy farmers were given mushroom cultivation training at IIHR, out of which 49 families are practising cultivation of mushroom with economic returns about ₹ 2100 per month and annually about ₹ 25,200. As the area is near to metropolitan city marketing, demand and sales were comparatively good.

Door step delivery services of milking machine were given by youth for which they charge a very subtle fee, it not only reduced the drudgery but also economically empowered youths in the village. By mutual consent of each other farm family milking time was fixed accordingly. It covers around 54 dairy families with monthly income around ₹ 7,000 per month and ₹ 84,000 annually.

Integrated Farming System

Under IFS module 10 families were covered, due to intervention there was an increase of farm income. Before intervention annual income was only about ₹ 80,000 but after intervention it was around ₹ 132,000. Some practices that were followed was; in-situ moisture conservation, residue

Table 1. Technology intervention groups & changes in Gross Farm Income (2016-2019)

Intervention Groups (Science/Technology)	Farms/ households (No)	Farmer/Resource base category	Gross Average income ₹ (2016)	Gross Average income ₹ (2019)	Gross Income increase
Mineral Nutrition+ Mastitis Kit+ Cow mats	151	Small holders, rainfed + livestock	72689	121568	67%
Fodder + Mastitis Kit+ Cow mats	147	Rainfed/dryland with livestock	118147	193020	63%
Ragi/Red Gram +Fodder+ Mineral Nutrition+ Mastitis Kit+ Cow mats	77		171398	275019	60%
Vegetables + Mineral Nutrition + Mastitis Kit	66		197892	315789	59%
Vegetables+ Mineral Nutrition+ Mastitis Kit+ Cow mats + Fertility Management	55	Irrigated, resource rich farmers with livestock	260083	512362	96%
Average			164041	283551	69%

Table 2. Annual Milk Poured (Ltr) in Society (2016-19)

Name of Society	Annual Milk Poured (Litres)				% Improvement (2016-19)
	2016-17	2017-18	2018-19	2019-20	
Lakshmidivipura	2,40,302	2,51,870	2,59,147	2,97,516	24%
S Nagenahalli	1,70,270	2,28,007	2,16,068	2,89,305	70%
Thimmajannahalli	28,929	1,09,126	1,07,303	1,19,038	311%
Total	4,39,501	5,89,003	5,82,518	7,05,859	61%

incorporation instead of burning, water harvesting and recycling for supplemental irrigation, growing drought tolerant varieties, water saving technologies, location specific agronomic and nutrient management, improved livestock feed and feeding methods. There was a 61% average income increase for small farmers through adoption of Mixed Cropping + Livestock model (Ragi/Chilli/Sheep/cattle/Backyard Poultry)

TRAINING

Trainings were provided to the beneficiaries of the project for skill development and promotion of entrepreneurship.

- Improved vegetable cultivation.
- Quality Milk Production and Mastitis Management.
- Lameness management in animals
- Mushroom cultivation.
- Fodder Production and Conservation.

IMPACT

Economic impact

The farmers were grouped into technology intervention groups and there was an Average 69% gross income increase across different technology interventions (Table 1 and Table 2).

Average Net Income of Ragi variety (ML-365) (₹ 30,000/ha) is

more compared to Local variety (₹ 14,000/ha). Red Gram variety (BRG 5) have average 14 q/ha yield compared to 10 q/ha by local variety. Onsite fodder cultivation & fodder trees on bunds resulted in 74% reduction of input cost involved in fodder purchase by small and marginal farmers. Reduction in Fodder Procurement cost ₹ 25200/yr or added return by selling fodder ₹ 27900/yr. There was a 61% average income increase for small farmers through adoption of Mixed Cropping + Livestock model (Ragi/Chilli/Sheep/Cattle/Backyard Poultry) (Average Income- Pre intervention: ₹ 49180 Post intervention: ₹ 79100). With a shift in crop from Ragi to Onion, farm income changed from ₹ 27,000 for Ragi crop/ha/season to ₹ 92000 for Onion. Gross Income of ₹ 81000/ha/season for Ridge Gourd, ₹ 96000/ha/season for Tomato and ₹ 1.2 lakhs/ha/season from Drumstick crop was obtained. On site nursery for seedling production of vegetables established and 3 rural youths attracted towards seedling production in the village.

Social impact

A positive attitude towards scientific agriculture has been observed among the farming community. Beneficiaries are socially motivated to continue good

agricultural practices as they observed profit and social recognition. With the additional income generated due to intervention under Farmer FIRST Programme helps them in securing their livelihoods and achieve a better social status. Rural youths are getting employment opportunity in the villages.

WAY FORWARD

Farmer FIRST programme is a unique concept of directly involving farmers from the planning to implementation of different location specific interventions and it has benefitted the farmers, as the location selected were not covered under any of the earlier schemes. The farmers and their available resources, along with their experiences and knowledge is the most key component in the approach.

- After the visible impact of many of the interventions, especially in dairy sector, KMF has come forward to take up the interventions to cover the near by villages.
- Further interventions in post-harvest value addition and market linkages will help in further enhancing the farm income and to make the interventions sustainable over long time.
- Agriculture waste management need to be worked on for clean environment.
- Creating linkages for support from the line departments, non-governmental organizations and other stakeholders will be key to sustaining the interventions.

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