

Intervention of improved agricultural technologies for livelihood and nutritional security adhering local resources and working knowledge of the farmers

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Location and selection of area

The project was initiated in 6 villages (Paniyara, Dhanapur, Lashkariya, Upaddhaypur, Baburam ka pura and Rajapur) in Araziline block of Varanasi district. Varanasi has humid sub-tropical climate with large variations between summer and winter temperature. Average annual rainfall is 1,110 mm; the land is very fertile because of low level floods in the Ganges that continually replenish the soil. The rationale behind selection of the project villages is the huge potential in vegetable whereas earlier only rice-wheat cropping system was followed. The area is enriched with all-natural resources, however resources have been underutilized due to lack of awareness and not proper utilization of working knowledge of the people.



The villages were near to the potential markets and ICAR-IIVR, and scientists could regularly visit the villages for continuous monitoring of the interventions.

Number of farm families

A total of 960 farm families were

selected from 6 villages in Varanasi district.

OBJECTIVE

The major objective of the project was to strengthen crop diversification by supplying quality inputs for nutritional and livelihood security, and to empower farmers/farm women in different aspects of agriculture enterprises as a livelihood diversification option through skill development.

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. The interventions were



Anil Singh of Paniyara village cultivated pea var. *Kashi Nandini* in one-acre area which produced 31.2 q yield and earned ₹ 43,700 from 65 days pea crop.



Rupkala and her three sisters of Dhanapur village cultivated *Kashi Rajhans* in 0.0625 acre area and got yield of 5.1 q with earning of ₹ 16,000.

categorized in 4 modules that have been explained here.

Horticulture based module

Small and marginal category of farmers were beneficiaries of this module. The main focus was on promotion of improved vegetable varieties through demonstrations and comparing with existing cultivar in both quality and yield. Early variety of Garden pea (Kashi Nandini) was incorporated in between rice-wheat cropping system for extra remuneration of the farmers. Tomato growers were very much worried about leaf curl disease of tomato. They were spending a lot on spraying chemicals to control leaf curl disease. They were suggested to grow leaf curl resistant tomato var. Kashi Aman which is resistant to TLCV. Farmers of that area were not cultivating French bean.

Kashi Rajhans a bush type high yielding variety of French bean, resistant to collar rot and bacterial blight, was introduced, which was highly preferred by the vegetable growers. Other successful vegetable varieties were Kashi Uttam brinjal, Kashi Anmol in chilli, Kashi Ganga bottle gourd, Kashi Harit pumpkin, Kashi Swetha radish, Kashi Arun carrot, etc. Owing to these demonstrations 31.47% increase in average production in vegetables was observed as compared to the existing cultivar in non-adopted villages.

Kitchen garden: Promotion of kitchen garden for nutritional security was another important component under horticulture module. Its objective was to fulfill vegetable requirement of a family round the year by rationally utilizing land or space available surrounding the house. Vegetables with satisfactory productivity, having more food value, nutritious and needed to be consumed fresh were promoted for raising in kitchen garden. Seasonal kitchen garden kit developed at ICAR-IIVR, was demonstrated among the farmers



Tarshankar Singh of Paniyara village grew WB-02 in 0.625-acre area yielding 11.2 q; earning an income of ₹ 14,850 in the year 2018.

mainly for their household consumption. It was observed that 47% beneficiary of kitchen garden shifted from low nutrition to medium nutrition category.

Crop based module

This module was followed for large farm categories who usually followed rice-wheat cropping system. Seed replacement for better yield, more nutrition and enhanced income was the motto of this module. Zinc fortified wheat var. WB-02 was introduced to combat Zn and Fe deficiency, particularly among the women and children. It was preferred by the growers for consumption purposes and it was reported that the taste of this variety was better than conventional wheat. However, farmers faced problems in marketing as this Zn fortified wheat looked same like conventional wheat, hence growers could not get a premium price for it and its productivity was also less than other commercial varieties.

Rice growers used to grow rice hybrid Moti and Damini and other

locally available cultivar. Under Farmer FIRST Programme they were provided with high yielding rice variety HUR-917 developed from BHU which is aromatic in nature, resistant to lodging and neck blast disease, and good grain quality having yield potential of 45-55 q/ha. It is suitable for double transplanting method which is a common practice of the farmer of that area. Salt tolerant rice variety CSR-43 was introduced for low lying and submerged areas having yield potential of 40-50 q/ha. Lentil variety HUL-57 was also demonstrated to the interested farmers for pulse crops.

Livestock based module

This module was operational mainly for landless labourers and marginal farm categories. Backyard poultry was promoted and 10,000 day-old-chicks of CARI- Debedra, CARI- Nirbheek and Kadaknath were procured from ICAR-CARI, Izatnagar and demonstrated among 200 landless beneficiaries along with starter feed and water feeder. Vaccination of the backyard poultry was conducted in the villages for sustainability of the model. Trainings were provided on poultry nutrition and hygiene and master trainer on poultry vaccination were prepared among the village youths.

Drawback of backyard poultry model and lesson learnt

One major problem observed in the different breeds procured from ICAR-CARI is that, the birds of one breed do not brood over the eggs of birds other breed, e.g CARI-Devendra do not help in hatching of Kadaknath eggs. Though some farmers tried to use conventional birds to hatch egg but did not succeed. So, to make the model sustainable and commercially viable community basis artificial hatchery is required.

Enterprise based module

The moto of this module was to promote business and entrepreneurship among the beneficiaries of Farmer FIRST Programme. The major intervention was—Promotion of low-cost net house for nursery raising and commercial vegetable cultivation. Farmers used to grow nursery of solanaceous vegetables in open field condition. However, the nursery got affected with heavy infestation of diseases and pests. The quality of seedling was poor and productivity of the crop was also affected due to unhealthy seedling. The low cost net house was introduced to check the problem. The size of the structure was 20 ft × 14 ft and 8 ft height. The structure was prepared under partnership mode. ICAR-IIVR supplied the net under Farmer FIRST Programme and the beneficiary farmers arranged bamboo and other raw materials for its making. The net house was also useful for cultivation of high value crops like capsicum, cucumber, tomato, etc. Promotion and commercial production of vermicompost was another intervention under this module. Commercial flower cultivation, preparation of garlands



Jugunu Rajbhar of Lashkariya village reared Kadaknath breed in his backyard and earned ₹ 17,000 in six months.



Radheyshyam Singh of Dhanapur village prepared a low-cost net house and cultivated tomato and capsicum in it and could save ₹ 11,000 due to less spray of chemical and pesticides.

and selling in the temples of Varanasi and around, preparation jaggery from sugarcane were other interventions

carried out.

Commercial flower cultivation

Drawback of low-cost net house and lesson learnt: The low-cost structure could not be sustainable because bamboo structure was attacked by termites. Some of the structures were destroyed in heavy winds and by wild animals. So, in future iron structure is essential to make this model successful and sustainable.

Lessons learnt from commercial flower cultivation

Improved marigold var. Pusa Nagangi was introduced for commercial flower cultivation. Big size flowers of Pusa Narangi are preferred for beautification and gardening purposes, but for garland, small to medium size of flowers are preferred. So, the variety was discontinued by the farmers as it could not solve the purpose of its introduction.

TRAINING

Trainings were provided to the beneficiaries of the project for skill development and promotion of entrepreneurship namely, Improved vegetable production technologies and kitchen gardening; safe and judicious use of pesticides in



Omprakash Dubey of Paniyara village started commercial nursery raising in the low-cost net house. In the year 2018 he raised nursery of pumpkin var. Kashi Harit and earned ₹ 22,000 by selling healthy seedling to the farmers.



Omprakash Dubey of Paniyara village established 15 units of vermicompost pit and earned ₹ 18,000 by selling vermicompost to the fellow farmers.

agriculture; on SHG and FPC formation; and Honey bee rearing.

IMPACT

Financial impact

Farmer beneficiaries are getting better remuneration from the demonstrations conducted under Farmer FIRST project. As for example, farmers cultivating vegetable pea Kashi Nandini got an average income of ₹ 4,841 from 1-acre land in comparison to local cultivar (₹ 2,970). Similarly, the farmers reared CARI breed of backyard poultry demonstrated under the project earned average income of ₹ 4,731 as compared to the local breed (₹ 3,778).

Social impact

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



Vijay Narayan of Lashkarya village cultivated sugarcane in 0.3125 acre area. Now he learnt to prepare jaggery and earned ₹ 36,000 from 650 kg jaggery in the year 2019.



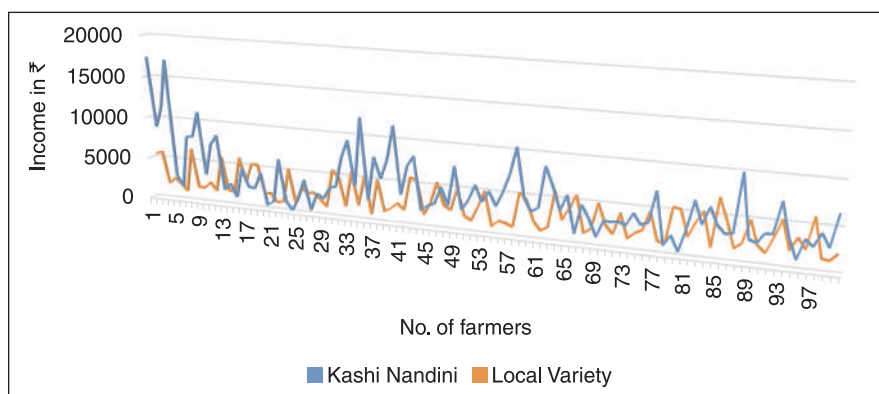
Formation of Farmer Interest Group (FIG) on honey bee rearing.

agricultural practices as they observed profit and social recognition. With the excess income they got due to intervention under Farmer FIRST Programme now their social status has upscaled and their livelihood becoming secure. Migration is being checked as rural youths are getting employment opportunity in the villages.

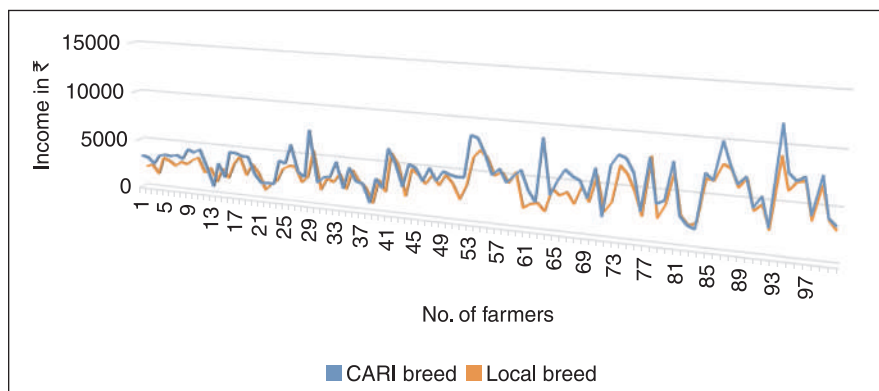
WAY FORWARD

Farmers' FIRST programme has become a ray of hope for the farmers in the adopted villages. The unique concept of the project has directly benefitted the farmers which they did not experience earlier from any other extension agency.

- Now time has come to spread the benefit of the project to the nearby villages through Carpet extension or Horizontal extension approach.
- Further action is required to make all the intervention modules sustainable.
- Intervention required towards value addition of the raw materials like post-harvest processing of the vegetables and egg products which has tremendous market value.
- Branding and lucrative packaging of the products under Farmers' FIRST is next target for capturing best market value.
- Proper agriculture waste management and biogas generation in the project villages need to be done for healthy environment.
- The project villages may be developed as Agro-eco-tourism spots in public-private-partnership mode.
- Advanced trainings are required for achieving such objectives and support from the Government and policy makers.



Comparison of income between Kashi Nandini and local cultivar of vegetable pea.



Comparison of income between ICAR-CARI breeds and local breeds of poultry.

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