

Technology integration for doubling farm income through participatory research and extension approaches

in Ranchi district of Jharkhand

Niva Bara*, Sushil Prasad, Rabindra Kumar, C S Singh, Jai Kumar Mintu Job, Arun Tiwary and Aloka Bage

Birsa Agricultural University, Kanke Patratu Rd, Ranchi, Jharkhand 834 006

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Location and selection of area

The project was initiated in District Ranchi, Jharkhand with four villages Chipra, Kudlong, Patratoli and Piska.

Number of farm families

A total of 1,000 farm families have participated in the project.

OBJECTIVES

- To provide technological interventions for enhancing income by addressing prioritized production problems for different micro farming situations and to assess their rate of adoption and impact.
- To introduce economically viable and socially acceptable agro-based entrepreneurial activities like bamboo-based handicrafts, post-harvest management of field crop, vegetables, spices, forest produce (Lac, bamboo) custom hiring of implements and lac processing, for enhancing income through strengthening backward and forward linkages.
- To build a network of linkages with different entities around the farm households, viz. technology institutions, input support systems, market and other agencies for facilitating access of information, technology and marketability of produce for higher returns.

- To find out the technical, socio-economic and environmental impact in terms of organic carbon, pH, water holding capacity of soil, soil fertility status and water quality of pond in the project to develop a database.
- To integrate women's participation by initiating special modules for enhancing income, livelihood security and drudgery reduction.
- To utilize the strength of technology institutions to develop commodity specific contents for knowledge sharing among various stakeholders specially farmers.
- To identify extrapolation domains for new technology modules in similar environment.

INTERVENTIONS

Livestock based module

Improved Goat Production, health care and management technology of

appropriate Goat variety like Black Bengal, Crossbred Black Bengal of Beetal.

Rationale of the intervention: Improved breed of black Bengal, scientific management and capacity building of farmers will enhance meat production to an extent of 50% and income to an extent of 60%.

Outcome: Before intervention farmers were trained in feeding, breeding, housing and health management. As stated by the farmers mortality was one of the important problem in goat. For improvement of the health condition, animal health and vaccination camps were organized regularly in different villages. Farmers including Senior Research Fellow (SRF) and Field Assistants were trained in animal health care and vaccination. As per PRA report goat population was increased from 275–1025. The goatery enterprise has become a very

Table 1. Performance and economic analysis of Goatry (Black Bengal)

Trait	Before intervention (Poor management)	After Intervention	
		Chipra	Kudlong
Growth (Body wt.)	10.00 kg/year	14.00 kg/year	15.00 kg/year
Twinning %	21%	33%	25%
Triplets %	5%	16%	11%
Mortality %	10%	4%	5%
Economics	Before intervention (₹)		
Average Annual family income (₹ per year)	50,000/-	After Intervention (₹) 87,550/- (cost of female 16,00/-, cost of kids 21,600/-)	



Animal Health Camp at Chipra.

popular and profitable business in the area. Very enthusiastic and wonderful results have been observed (Table 1).

Increase in twinning (33% & 25%) and triplet (16% & 11%) percentage in case of goateries was due to improved buck i.e. beetal. Mortality percentage was decreased by 4% and 5% in village Chipra and Kudlong respectively due to monitoring and regular health camps.

Training: Training on scientific goat rearing was conducted in the field as well as at Birsa Agricultural University. Exposure visits were organized at animal farms of Birsa Agricultural University. Training were also provided to para-vets including SRF and Field Assistants.

Impact: Extrapolation of technology has been observed in nearby area and the tribal farmers are considering this as a beneficial enterprise for their socio-economic upliftment.

Due to effort of Farmer FIRST Programme goat population has increased to an extent of 272%. Feedback from farm women were quite positive as Jawany Devi W/o Kajru Kujur of Kudlong said that she sold three goat and earn a sum of ₹ 25000/- which helped her husband to develop his business (Glossary shop). Similarly, Asha Kachhap W/o Prem Kachhap a poor women of village Kudlong earned a sum of ₹ 21000/- and leased 50 decimals of land for rice cultivation.

Drawback and lesson learnt: As

vegetable cultivation is also an important enterprise of the area sometimes goat destroy the vegetable fields which creates social unrest.

Crop based module

Enhancing productivity and profitability of the farmers through cultivation of high value crop i.e. sweet corn.

Rationale of the intervention: Diversification of Maize with Sweet corn will enhance the profitability and intensification of cropping system.

Outcome: Under the Farmer First Programme the scientists of the Birsa Agricultural University organized Scientists-Farmer Interface & training programmes to convince the farmers to grow sweet corn with scientific management in place of normal maize. Earlier the farmers of this area were unaware of sweetcorn. Sweetcorn seeds along with inputs were distributed among 30 farmers of Chipra village.

Sri Pancham Mahto is one of the young and energetic farmer of Chipra village having about 2 acre of land and few animals. He cultivated sweet corn with scientific advice of scientists of Birsa Agricultural

University. The seed of sweet corn variety Sugar-75 were sown by him and for weed control atrazine was applied 1-2 days after sowing. Application of Furadon and Imidachloprid is done by him for the control of *chilo partellus* a dangerous pest of *Kharif* maize. He sold his produce thrice of normal maize and got huge profit (Table 2). He also observed that his produce were liked and were in great demand. In addition he got huge quantity of green fodder which he utilized for feeding of his livestock thereby saved money which he supposed to spend for purchasing green fodder. Now Sri Pancham Mahto was fully convinced to grow sweet corn which not only enhanced his profitability but also improved his socio-economic status.

Training: Training on scientific cultivation of sweet corn i.e. improved varieties balance dose of nutrient need based plant protection measures was conducted.

Impact: Extrapolation of technology has been observed in nearby area and considering its commercial value many tribal farmers are now ready to adopt this as a profitable crop.

Drawback and lesson learnt: Seeds of sweet corn is quite expensive therefore it is difficult for small and marginal farmers to purchase seeds. Due to sweet in nature at initial period seed is infested by ant and termite.

Diversification and intensification of cropping system with inclusion of high value crop like sweet corn will enhance productivity and profitability. Due to its commercial value it is high in demand.

Horticulture based module

Increasing income of farmers through improved cultivation of Aloe vera.

Rationale of the intervention: Cultivation of suitable variety along with scientific practices and market

Table 2. Comparative analysis of Sweet corn VS Maize cultivation

Year	Cost of cultivation (₹)		Yield (ha)		Net Return (₹)		B:C	
	Sweet corn Sugar-75	Maize	Sweet corn Sugar-75	Maize	Sweet corn Sugar-75	Maize	Sweet corn Sugar-75	Maize
2016-2017	40000	22000	130	120	155000	38000	3.87	1.72
2017-2018	405560	22690	131	110	155940	32310	3.84	1.42
2018-2019	41950	23750	127	119	148550	35750	3.57	1.50

Table 3. Economic Analysis of cultivation of Aloe vera Gujarat-1

Variety	Year	Cost of cultivation (₹)	Yields (kg)	Av.Net return/ acre (₹)	B:C Ratio
Gujarat -1	2017-18	78000	8100	337000	4.19
Gujarat -1	2018-19	79760	8660	353240	4.42

linkage profitability will be increased to an extent of 100 per cent.

Outcome: Jharkhand is rich in Agro-biodiversity. There are many medicinal plants which are underutilized. During Agro-eco-system analysis at Nagri Block of Ranchi district it was found that low profitability of medicinal plant were due to use of low yielding varieties/species, lack of knowledge and improper marketing facility. For potential solution of this problems use of improved variety along with bio-fertilizer were intervened. Farmers were completely unknown about the technology and reluctant to adopt this for the first time. So first of all training cum exposure visit was organized at Forestry faculty of Birsa Agricultural University, Ranchi to motivate the farmers. After lot of persuasion and training scientists

were able to convince few farmers to adopt this technology, gave knowledge about the improved variety and aware them regarding market value. They also assured them for market linkage for the sale.

Sri Bhola Mahato 49-year-old progressive farmer of Chipra village came forward for cultivation of Aloe vera. He is matriculate, have two children and dependent completely upon agriculture for his livelihood. During the year 2017–18 Sri Bhola Mahato approach Farmers FIRST team for cultivating Aloe vera in his waste land i.e. 10 decimals. He got bumper crop of Gujarat-1 variety of Aloe vera and got motivated to take up this crop in another 50 decimals. He motivated other farmers also to take up Aloe vera cultivation and provided seedlings to them.

Because of this intervention,

concerned farmers have increased their income up to four times with B:C Ratio varied from 4.19–4.42 (Table 3).

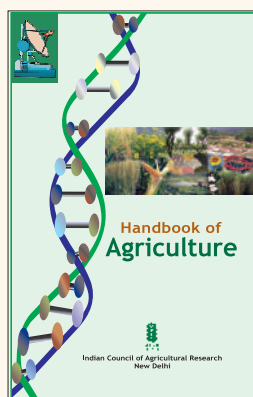
Training: Training on improved cultivation of Aloe vera was conducted at farmers' field. Exposure visit was organized at Birsa Agricultural University.

Impact: Cultivation of Aloe vera was found to be profitable and economically viable. There is scope for value addition.

Drawback and lesson learnt: Marketing is a problem however later it was solved. This enterprise is most challenging but profitable. Some farmers had rejected this cultivation earlier because they think that Aloe vera will occupy their field for longer time. Somehow few of them were ready to take risk on their waste land. For making this enterprise economically viable backward and forward linkage should be strengthened.

*Corresponding author's email: drnivabaraxtn@gmail.com

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