UTTAR PRADESH

Farm profitability realization through farming system approach

GPS Location

Latitude	Longitude	Altitude (m)
26°30'501'' N	079°52'577'' E	127

Shri Ashwani Kumar, a marginal farmer residing in a village Bharat Singh ka purwa located in Akbarpur block of Kanpur Dehat district of Uttar Pradesh was selected for diversification of existing farming systems by OFR-Centre, Kanpur Dehat.

Crop diversification with mustard, berseem and fodder sorghum

Five member family was deriving livelihood from 1 ha land. The prevalent farming system was crop + livestock with average annual rainfall of 801 mm.

During the bench mark survey in May, 2013, it was found that Sri. Ashwani Kumar was growing rice (0.8 ha), maize (0.2 ha) in *kharif* and wheat (0.8 ha), gram (0.2 ha) in *rabi*. The productivity of all crop was low as compared to potential yield. The major constraints for low productivity were identified as no application of potassium and Zinc, higher dose of nitrogenous fertilizers; higher seed rate and weed infestation. In addition to crop production, he had maintained one local buffalo and one cross bred cow. Total milk production of both the animal was 1815 litre / year which was very low as compared to potential milk production. The major constraints for low milk yield were poor nutrition, imbalance feeding, improper health care and poor shelter. At the time of bench mark, he was getting total annual income of Rs. 73825 only from crop and livestock for their family.

Shri Ashwani Kumar was selected during *kharif* 2013 for conducting on–farm experiment titled “Diversification of existing farming system under marginal household conditions”. The constraints in crops were addressed by applying low cost and knowledge based interventions with supplying Muriate of Potash (MOP) and Zn, recommended dose of N, recommended seed rate, weed management and timely sowing. For year round green fodder availability, crop diversification with fodder sorghum and berseem in 0.1 ha was done. Diversification of mustard in 0.1 ha was also practiced to meet the requirement of family. In fallow area of summer, green gram in 0.1 ha was introduced to fulfil the family’s pulses requirement. Additional income of Rs. 7315 was realized after interventions and diversification in crops.

Mineral mixture as intervention for livestock

Similarly, in livestock component, the main constraints were addressed by making availability of green fodder by growing fodder sorghum and berseem, supply of 20 kg mineral mixture and Penacure dewormer. In addition to this,

Farming systems improvement through diversification and technological interventions

Particular of House hold	Farmers practices	Improve practices (after intervention)
	Kharif	
Paddy	0.8 ha	0.8 ha
Yield (kg)	4500	4550
Gross income (Rs)	49500	54600
Cost of cultivation (Rs)	25400	26500
Net income (Rs)	24100	28100
Maize	0.2 ha	0.2 ha
Yield (kg)	350	210
Gross income (Rs)	2800	2310
Cost of cultivation (Rs)	1500	1700
Net income (Rs)	1300	610
Diversification	NIL	3500
Fodder sorghum yield for fodder	0.1 ha	
	Rabi	
Wheat	0.8 ha	0.8 ha
Yield (kg)	3500	3020
Gross income (Rs)	42000	42280
Cost of cultivation (Rs)	17900	19500
Net income (Rs)	24100	22780
Chickpea	0.2 ha	0.2 ha
Yield (kg)	160	200
Gross income (Rs)	4000	6400
Cost of cultivation (Rs)	1550	3100
Net income (Rs)	2450	3300
	Diversification	
Mustard	-	0.1 ha
Yield (kg)	-	145
Gross income (Rs)	-	5075
Cost of cultivation (Rs)	-	2100
Net income (Rs)	-	2975
Berseem for Green fodder yield	0.1 ha	6500

Particular of House hold	Farmers practices	Improve practices (after intervention)
	Summar	
Green Gram	-	0.1 ha
Yield (kg)	-	80
Gross income (Rs)	-	3200
Cost of cultivation (Rs)	-	1700
Net income (Rs)	-	1500
Livestock (Cow)		
Milk yield (litres)	915.00	1100
Gross income (Rs) @ Rs. 30/litre	22875.00	27500.00
Rearing cost (Rs)	13000.00	16600
Net income (Rs)	9875.00	10900.00
Livestock(Buffalo)		
Milk yield (litres)	900	1200
Gross income (Rs) @ Rs. 30/litre	27000	36000
Rearing cost (Rs)	15000	20200
Net income (Rs)	12000	15800
Total net income (Rs)	73825	85965

Nutritional kitchen garden

knowledge on clean milking, sanitation of shelter and timing of proper feeding schedule was imparted. These interventions resulted in additional milk yield of 485 litres/ year. The total milk production was increased from 1815 litre to 2300 litre which recorded 26.8 % additional benefits over benchmark.

Capacity building

Under product diversification, a nutritional kitchen gardening was promoted to fulfil fruit and vegetable requirement of family. Organic kitchen garden was established in 200 m^2. Vegetable seeds of okra, bittergourd, palak, and pumpkin, cucumber alongwith saplings of lemon, karonda, papaya and banana were planted. A total of 65 kg of vegetables were produced and consumed by family.

Under the capacity building programme, trainings on improved practices of *kharif* and *rabi* crops, rearing of animal, goat and organic kitchen garden were conducted to enrich practical knowledge of the farmer. After interventions in crop, live stock, nutritional kitchen gardening, product diversification and capacity building the farmer obtained annual income of Rs. 85,965/year. Additional income of Rs. 12,140 was obtained due to interventions which is 16% higher in the first year.

Many of the households in village Bharat Singh Ka Purwa, Sarva, Ambarpur, and Jaitpur are using potassium application in their crop which they did not use earlier. Many households are also giving mineral mixture, dewormer (Penacure) and vaccination to their animal for obtaining higher milk.

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Farming Systems Research
Success Stories
ICAR-AICRP on IFS

Diversification of farming system components doubles income of marginal farm holder

GPS Location

Latitude	Longitude	Altitude (m)
26^{0}36'385'' N	80^{0}00'034'' E	129

Shri Roshan Lal, a marginal farmer residing in a village Jaitpur located in Maitha block of Kanpur Dehat district in Uttar Pradesh was selected for experiment by OFR Centre, Daleep Nagar, Kanpur. He is alone in his family during livelihood from 0.6 ha. Prevalent farming system was crop + livestock with rainfall of 801 mm.

Diversification of rice and wheat with maize and pulses

Integration of goat in existing system

During bench mark survey in May, 2013, it was found that Shri Roshan Lal was growing only rice in *kharif* and wheat in *rabi*. The productivity of rice and wheat was low compared to potential yield. The major constraints for low productivity were identified as no application of potassium and zinc, higher dose of nitrogenous fertilizers and higher seed rate. In addition to crop production, he had maintained one local buffalo. Total milk production of buffalo was 490 litre / year which was very low. The major constraints for low milk yield were poor nutrition, imbalanced feeding, improper health care and poor shelter. At the time of bench mark, he was getting total annual income of Rs 28150 only from crops and livestock.

Shri Roshan Lal was selected during *kharif* 2013 for conducting OFR experiment titled "Diversification of existing farming system under marginal household conditions" by OFR Centre, Daleep Nagar, Kanpur Dehat under C.S. Azad University of Agriculture and Technology, Kanpur.

The major constraints in crop were addressed by applying low cost and knowledge based interventions like supplying Muriate of Potash (MOP) and Zn, recommended dose of N, recommended seed rate, weed management and timely sowing. For year round green fodder availability, diversification with maize in 0.1 ha was done. Diversification with gram in 0.1 ha was also done to save market expenditure on pulses. In fallow area of summer, Mentha in 0.1 ha was grown to get more income. Additional income of Rs. 18990 was gained after interventions and diversification from crops.

In livestock component, the main constraints were addressed by making availability of green fodder as maize stalk and 10 kg concentrate. In addition to this, knowledge on clean milking, sanitation of shelter and proper feeding schedule was

Farming system improvement through interventions

Particular of House hold	Farmers practices	Improve practices (after intervention)
	Kharif	
Paddy	0.5 ha	0.5 ha
Yield (kg)	2200	2450
Cost of cultivation (Rs)	14500	15500
Net income (Rs)	9700	13900
Diversification with Maize		
Maize	0.1 ha	-
Yield	-	200 kg
Cost of cultivation (Rs)	-	1500
Net income (Rs)	-	700
	Rabi	
Wheat	0.5 ha	0.5 ha
Yield (kg)	2150	2315
Cost of cultivation (Rs)	12500	15000
Net income (Rs)	13300	17410
	Diversification with chickpea	
Chickpea	0.1 ha	0.1 ha
Yield (kg)	-	140
Cost of cultivation (Rs)	-	1750
Net income (Rs)	-	2730
	Summer	
Mentha	0.1 ha	0.1 ha
Oil yield (litre)	-	15
Cost of cultivation (Rs)	-	4000
Net income (Rs)	-	7250
	Livestock (Buffalo)	
Milk yield (litre)	490	600
Rearing cost (Rs)	9550	9800
Net income (Rs)	5150	8200
Total net income (Rs)	28150	50890

Okra in nutritional kitchen garden

Capacity building

adopted. These interventions resulted in additional milk yield of 110 litres. A three month goat kid was provided to supplement his household income.

Under product diversification, a nutritional kitchen garden of 200 m^2 was promoted to fulfil the fruit and vegetable requirement. Vegetable seeds of okra, bittergourd, palak, pumpkin, cucumber along with saplings of lemon, karonda, papaya and banana. Total of 52 kg of vegetables/year were produced in a year.

Under the capacity building, trainings on improved practices of *kharif* and *rabi* crops, rearing of buffalo, goat and nutritional kitchen garden were imparted to enrich practical knowledge of the farmer. After interventions in crop, live stock, nutritional kitchen garden and capacity building, the farmer obtained Rs. 50890 per year. Additional income of Rs. 22740 was obtained due to interventions in different farming system components which resulted in 78 % higher income with in a year.

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Farming Systems Research
Success Stories
ICAR-AICRP on IFS

Crop diversification in farming systems results in improved crop and livestock productivity

GPS Location

Latitude	Longitude	Altitude (m)
26^{0}030'446'' N	79^{0}54''051' E	128

Shri Dharam Pal Singh, a marginal farmer residing in Sarwa village located in Akbarpur block of Kanpur Dehat district of Uttar Pradesh was selected for OFR experiment by OFR Centre, Daleep Nagar, Kanpur. He was deriving his livelihood for his 4 member family form 1 ha area by growing arhar (0.1 ha) and maize (0.8 ha) in *kharif* and wheat (0.8 ha) and mustard (0.1 ha) in *rabi*. The major constraints for low productivity were identified as no application of potassium and zinc, higher dose of nitrogenous fertilizers, higher seed rate and weed infestation. He had maintained one local buffalo and two cross bred cows. Total milk production of both the animal was 4015 litres/year. The major constraints for low milk yield were poor nutrition, imbalance feeding, improper health care and poor shelter. The farmer was getting only Rs. 95730/year from the existing farming system.

Diversification with mustard and fodder sorghum

The major constraints in crops were addressed by applying low cost and knowledge based interventions like supplying Muriate of Potash (MOP), recommended dose of N, recommended seed rate, weed management and timely sowing. For year round green fodder availability, diversification with fodder sorghum in 0.1 ha was done. Diversification with mustard in 0.1 ha was also practiced to save market expenditure on oil for the family. In fallow area of summer, green gram in 0.2 ha was grown to fulfil pulse requirement.

In livestock component, the main constraints were addressed by making availability of green fodder by supplying fodder sorghum, mineral mixture (25 kg), vaccination for FMD, and hump sore diseases and dewormer. In addition to this, knowledge on clean milking, sanitation of shelter and timing of proper feeding schedule was also imparted. These interventions resulted in additional milk yield of 385 litres/ year.

Under product diversification, a nutritional kitchen garden in 150 m^2 was promoted to fulfil fruit and vegetables requirement. Vegetable seeds of okra, bittergourd, palak, pumpkin, cucumber alongwith saplings of lemon, karonda, papaya and banana were planted. Total 50 kg of vegetables were produced and consumed by family. The fruits plants in kitchen garden is also expected to additional benefit in the long term.

Interventions of mineral mixture and vaccination for livestock

Particulars	Farmers practices	Improve practices (after intervention)
	Kharif	
Maize	0.8 ha	0.8 ha
Yield (kg)	2350	2480
Gross income (Rs)	23500	27280
Cost of cultivation (Rs)	11350	13090
Net income (Rs)	12150	14190
Arhar (Pigeonpea)	0.1 ha	0.1 ha
Yield (kg)	150	170
Gross income (Rs)	5250	5950
Cost of cultivation (Rs)	2050	2580
Net income (Rs)	3200	3370
Diversification (0.1 ha)	-	3200
	Rabi	
Wheat	0.8 ha	0.8 ha
Yield (kg)	3515	3580
Gross income (Rs)	42180	50120
Cost of cultivation (Rs)	20150	23600
Net income (Rs)	22030	26520
	Diversification Mustard (0.1 ha)	
Yield (kg)	-	145
Gross income (Rs)	-	5220
Cost of cultivation (Rs)	-	2350
Net income (Rs)	-	2870
Diversification Summer crop		
Greengram		0.1 ha
Yield (kg)	-	150
Gross income (Rs)	-	6300
Cost of cultivation (Rs)	-	2400
Net income (Rs)	-	3900
Livestock (Cow-02)		
Milk yield (litres)	2800	3000
Gross income (Rs)	70000	75000
Rearing cost (Rs)	29750	32750
Net income (Rs)	40250	42250
Livestock(Buffalo-01)		
Milk yield (Litres)	1215	1400
Gross income (Rs)	36450	42000
Rearing cost (Rs)	18350	21200
Net income (Rs)	18100	20800
Total net income (Rs)	95730	113900

After interventions in crops, live stock, nutritional kitchen garden and capacity building, the farmer obtained annual income of Rs. 1,13,900/year. Additional income of Rs. 18,170 was obtained due to intervention in different farming system components.

Nutritional kitchen garden for meeting hosehold vegetables and fruits

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Farming system interventions gives additional income to marginal holder

GPS Location

Latitude	Longitude	Altitude (m)
26^{0}29'970'' N	079^{0}54'790'' E	125 m

Shri Radha Krishna, a marginal farmer residing in Amberpur located in Akbarpur block of Kanpur Dehat district in Uttar Pradesh was selected for adopting OFR experiment by OFR centre, Daleep Nagar, Kanpur Dehat. Six member family was living with 0.7 ha area by growing rice (0.3 ha), maize (0.4 ha), in *kharif* and wheat (0.3 ha) and mustard (0.4 ha) in *rabi*. The family also maintained one murrah buffalo. Total milk production of one buffalo was 900 litre/year which was very low as compared to potential milk production. The major constraints for low milk yield were poor nutrition, imbalance feeding, improper health care and poor shelter. Family was earning only Rs. 39500 from agriculture.

Shri Radha Krishna was selected during Kharif 2013 for on–farm experiment titled "Diversification of existing farming system under marginal household conditions" by OFR centre, Daleep Nagar, Kanpur Dehat under C.S. Azad University of Agriculture and Technology, Kanpur. As new integration, backyard poultry was introduced to increase household income. 10 no. of 10 days old chicks (100gm) were integrated and after nine month birds gained 1kg weight.

Diversification with fodder sorghum and chickpea

Farming system interventions and benefit

Particular	Farmers practices	Improve practices (after intervention)
	Kharif	
Paddy	0.3 ha	0.3 ha
Yield (kg)	1500	1620
Gross income (Rs)	16500	19440
Cost of cultivation (Rs)	7400	9000
Net income (Rs)	9100	10440
Maize	0.4 ha	0.3 ha
Yield (kg)	300	280
Gross income (Rs)	3000	3080
Cost of cultivation (Rs)	1500	3060
Net income (Rs)	1500	20
Diversification Fodder sorghum (0.1ha)		
Yield (kg)	-	2500
	Rabi	
Wheat	0.3 ha	0.4 ha
Yield (kg)	1000	1800
Gross income (Rs)	12000	25200
Cost of cultivation (Rs)	7200	12000
Net income (Rs)	4800	13200
Mustard	0.4 ha	0.2 ha
Yield (kg)	300	250
Gross income (Rs)	9000	7500
Cost of cultivation (Rs)	2450	2000
Net income (Rs)	6550	5500
Diversification Chickpea		0.1 ha
Yield (kg)	-	130
Gross income (Rs)	-	3900
Cost of cultivation (Rs)	-	1700
Net income (Rs)	-	2200
	Diversification (Summer)	
Green gram	-	0.2 ha
Yield (kg)	-	150
Gross income (Rs)	-	6300
Cost of cultivation (Rs)	-	2150
Net income (Rs)	-	4150
Livestock (Buffalo-01)		
Milk yield (Litres)	900	1080
Gross income (Rs)	27000	32400
Rearing cost (Rs)	9500	9800
Net income (Rs)	17500	22870
Total net income (Rs)	39320	58480

Under product diversification, a nutritional kitchen garden of 100 m^2 was promoted to fulfil fruit and vegetable requirement of family. Total of 57 kg of vegetables were produced and consumed by family.

Intervention of mineral mixture, vaccination and deworming in livestock

Nutritional kitchen garden

After interventions in crop, livestock, nutritional kitchen garden and capacity building, the farmer obtained Rs 58480. Additional income of Rs 19160 was obtained due to interventions in different farming system modules.

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