

Integrated farming system:

way for doubling the income of rainfed farmers

M L Jadav*, D V Bhagat, Narendra Kumawat and S K Choudhary

All India Coordinated Research Project for Dryland Agriculture, College of Agriculture, Indore,
Madhya Pradesh 452 001

Village Damali, block Mhow is the tribal dominated village of Indore district in which farmers chiefly use traditional agriculture practices. One of the farmers, Siyaram during 2016–17 earned annual income of ₹2,13,000 from the existing traditional farming system. He was facing several issues regarding agricultural practices. Through AICRPDA Project (which provides improved seeds, technical knowledge, introduction of vegetables crops, vaccination to animals, mineral mixture and introduction of improved implements) in the year 2020–21, Siyaram's farming situation changed from field crop to horticultural and livestock based farming. During this period soybean and maize was the common crop and there was no significant change in production and the net income was around ₹45,000 per year. Hence, it is also concluded that only field crops cannot increase the income of the farmer. The increase of net income is due to the adoption of vegetables crops (₹2,43,000) as well as dairy farming (₹6,02,680). Integrated farming systems can enhance the income of the small and marginal farmers. Government's mission to double the income of the farmers can be possible by integrating horticultural and dairy farming (IFS).

Keywords: Dairy Farming, Horticulture, IFS, Soybean

VILLAGE Damali, block Mhow is the tribal dominated village of Indore district in which farmers mainly follow traditional agriculture practices. This village has a total cultivable land of 82 ha. The village mostly has an undulating agricultural land, which is highly prone to soil erosion and thus falls under the category of shallow depth soil. These villages are located in the boundaries of Malwa and Nimar region. Village Damali is almost fully dependent on the rainfed agricultural farming system. Most of the farmers of this village are engaged as labourers in other villages for their livelihood besides agricultural practices at their own field. Since shallow soil is available

with undulating slopes in this village, most of the farmers are producing short durational soybean varieties and local maize during *kharif* and thereafter desi chickpea in *rabi*. Few farmers also produce wheat in *rabi* with very limited irrigation water

from tube wells. Some farmers are also involved in pottery and poultry activities, which may not be considered as any income generating activities. Most farmers are having one or two cows for their own use. These cows are left in the nearby jungle for grazing. In this village, only one farmer is involved in dairy-farming with few cows and buffaloes. On the whole, this village Damali is located far from the district headquarter and farmers are involved in agricultural activities under adverse situations. These farmers are still far away from modern agricultural implements and agricultural practices. They are trying very hard to cope-up with these adverse situations while continuing



Onion and Potato crop



Use of machinery



Intercultural operation

to follow traditional agricultural practices.

It can be inferred that the process of modernisation in the agricultural production system is very slow in this village. Almost all farmers have been adopting a traditional rainfed farming system since decades. Therefore, based on a survey carried out by All India Coordinated Research Project for Dryland Agriculture, College of Agriculture, Indore, it was decided in 2017–18 that the value addition of traditional rainfed farming system was carried out initially keeping all the conditions. Project started the work for the strengthening of traditional rainfed farming systems with improved rainfed technologies. Scientists of the project are involved in integration of farm enterprises to enhance the farm incomes. The project provided improved varieties of soybean (JS-9560), maize (JM-216), pigeonpea (PUSA-992), chickpea (RVG-201) and fodder (MP Chari-TL) during *kharif* of 2020–21. The farmers were also provided with fruit plants of mango, lemon, guava and jackfruit. Sulphur fertilizer (Bentonite) was provided along with PSB and Rhizobium. Animal health and vaccination camp was organized under the project with the help of the animal health department through which all animals were vaccinated. Demonstration/training was also organized in which farmers were trained for preparation of enriched fodder. Mineral mixture (HIMIN) was provided for milking animals. The ridge and furrow method was

applied for sowing. *Dora*/hand hoe have been used by the farmers for intercultural operation. This way farmers of village Damali have been strengthening their traditional farming system. Hence, a new

initiative has been successfully started with coordination of scientists and farmers.

Here, the success of a farmer Siyaram s/o Madanlal presents the changing scenario of farming through

Table 1. Farming economics in 2016–17

Component	Crop/Livestock	Area (Acre)/ Number	Production (q/L)	Gross income (₹)	Net income (₹)
Field Crop 1	Soybean (<i>kharif</i>)	3.0	15.0 q	37500	15000
Field Crop 2	Maize (<i>kharif</i>)	0.75	8.0 q	12800	6800
Field Crop 3	Gram (<i>rabi</i>)	3.0	10.0 q	38000	17500
Field Crop 4	Wheat (<i>rabi</i>)	0.60	8.0 q	13600	6100
	Total		41.0 q	101900	45400
Hort. Crop 1	Nil	-	-	-	-
Hort. Crop 2	Nil	-	-	-	-
Livestock 1	Buffalo	04 No.	10800 L	324000	124000
Livestock 2	Cow	02 No.	3600 L	93600	43600
	Total		14400 L	417600	167600
Fodder Crop	Chari local	0.15	25q	Used to feed animal	
Total	519500	213000			

Market rate (₹ per tonne): Soybean-25000/-, Maize-16000/-, Gram-38000/-, Wheat-17000/-, (₹ per Litre): Buffalo milk-30/-, Cow milk-26/-

Table 2. Farming economics in 2020–21

Component	Crop/Livestock	Area (Acre)/ No	Production (q/L)	Gross income (₹)	Net income (₹)
Field Crop 1	Soybean (<i>kharif</i>)	3.0	18 q	54000	29500
Field Crop 2	Green clusterbean (<i>kharif</i>)	0.75	12 q	24000	12000
Field Crop 3	Gram (<i>rabi</i>)	1.0	4 q	16000	4000
	Total		34.0 q	94000	45500
Hort. Crop 1	Onion (<i>rabi</i>)	0.75	55 q	154000	133000
Hort. Crop 2	Potato (<i>rabi</i>)	1.25	70 q	94500	62500
Hort. Crop 3	Green coriander (<i>rabi</i>)	0.5	25 q	62500	47500
	Total		150 q	311000	243000
Livestock 1	Buffalo	8 No.	21050 L	842000	432000
Livestock 2	Cow	4 No.	7130 L	256680	170680
Total	28180 L	1098680	602680		
Fodder Crop	Chari hybrid	0.25	70q	Used to feed animal	
	G. Total			1503680	891180

Market rate (₹ per quintal): Soybean-30000/-, Gram-40000/-, Potato-13500/-, Onion-28000/-, Coriander-25000/-, (₹ per Litre): Buffalo milk-40/-, Cow milk-36/-



Demonstration of Pheromone trap



Distribution of fertilizer and seeds

integrated farming system (IFS).

Farmers used to get an annual income of ₹2,13,000 from field crops (soybean, maize, wheat and gram) and milking animals like buffalo, cow in 2016–17. They faced problems like unavailability of irrigation water, good quality improved varieties, their implementation, lack of knowledge of vegetable/horticultural crops, animal health problems, lack of high milking animals. In rainfed conditions, water unavailability was the major concern. Rainwater harvesting could play an important role in increasing irrigation facilities. AICRPDA project provided improved seeds of crops, technical knowledge of crop production, introduction of vegetables crops, vaccination to animals, mineral mixture and introduced improved implements.

Government departments worked here to improve the farmer's life. The farming situation changed from field crop based to horticultural and livestock

based farming (Table 1 and Table 2). During 2016–17 soybean and maize was a common crop and there was no significant change in their production and income. During both the years net income was around ₹45,000 annually, which clearly stated that only field crops could not increase the income of the farmer. In the case of horticultural crops in 2016–17, there were no such crops grown by farmers. During 2020–21, onion, potato and coriander were grown. Total production and net income from the horticultural crop was 150 q and ₹2,43,000, respectively. Farmers also increased the number of livestock during the year, because it gave a high jump in net income, despite being a labor consuming activity. All the family members got engaged in farming and the milk production increased twice in 2020–21 as compared to 2016–17. Chari as green fodder was grown by farmers to feed their own animals. It was concluded

that by adopting IFS, farmers have been benefited. Gross income increased from ₹5,19,500 to ₹15,03,680 and net income from ₹2,13,000 to ₹8,91,180 during 2016–17 to 2020–21. Increase in net income was observed due to adoption of vegetables crops as well as dairy farming.

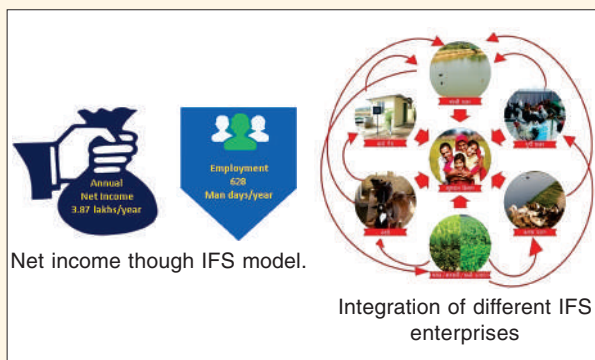
SUMMARY

More income generation can only change the lifestyle of the farmer and bring prosperity. Integrated farming systems can enhance the income of the small and marginal farmers. By growing field crops, vegetables and fruits in addition to rearing cattle, income could be raised among farmers of Damali village. Hence, the government's mission to double the income of the farmers can be possible by horticultural and dairy farming.

*Corresponding author's e-mail: mjadavujn@gmail.com

Integrated Farming System: A step towards doubling farm income

Integrated farming system (IFS) model was developed with the concept of integration of multiple enterprises (crops, livestock's, beekeeping, fisheries etc.) in a single farm unit to ensure year-round income and employment for a farm family having 1 ha irrigated land. Net income of model was ₹3.87 lakh/year along with 628 man days engaged throughout the years. The highest net income (₹1.68 lakh/year) was obtained from livestock (3 crossbreed cows) enterprise followed by crop (₹1.06 lakh). Model depicted that the total carbon assimilation by the crop enterprises was 4,448 kg/annum. Carbon cycle assessed using farm design tool showed that total input of carbon from the crop enterprises to household and animal was 603 and 5,555 kg/annum respectively. The addition of carbon from crop and livestock manure to the soil was 256 and 1,698 kg/annum respectively. Overall accumulation of carbon in the soil was 1,955 kg per annum which ultimately enriches the organic matter pool of the soil.



Source: ICAR Annual Report (2020)