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RESEARCH ARTICLE

IMPACT OF INTEGRATED FARMING SYSTEM ON SMALL AND MARGINAL FARMERS OF ROHTAK DISTRICT

Meena Sewhag, D.S. Ahlawat, Neeraj Pawar and Joginder Kumar*

CCSHAU Regional Research Station, Rohtak, Haryana, India
**Department of mathematics and Statistics*
Email:meenasewhag@gmail.com

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Abstract: A survey on integrated farming system in Rohtak was conducted by CCSHAU Regional Research Station; Rohtak in 2021.The objective of the survey was to compare the economics of integrated farming system with conventional cropping system and to study the constraints in adopting IFS by small and marginal farmers of Rohtak district. A sample of 25 farm households each of crop alone, crop+ dairy, crop + horticulture, crop + vegetable, Crop + Fishery, Crop + horticulture + vegetables and crop +dairy integrated farming systems were selected for giving proportionate allocation to the available integrated farms in 5 villages The present study confined to Rohtak district in which five blocks i.e. Kalanaur, Meham, Rohtak, Sampla and Lakhan Majra blocks. In this context 5 farmers from each block of Rohtak district has been selected randomly which have adopted Integrated Farming System. Simplier tabular analysis was done for calculating the economics of various enterprises. Among various IFS components highest BC ratio was recorded with Crop + Vegetable + Horticulture (1.72) followed by Crop+ Dairy (1.67) and Crop + Vegetable (1.63). Lowest B: C was observed in crop + fishery. This is due to lower crop yield in areas where fishery is practiced. A sample of 25 farm households each of crop alone, crop+ dairy, crop + horticulture, crop + vegetable, Crop + Fishery, Crop + horticulture + vegetables and crop +dairy integrated farming systems were selected for giving proportionate allocation to the available integrated farms in 5 villages. The BC ratio of Crop + Vegetable + Horticulture and Crop+ Dairy were 21.98 % and 18.43 % higher than Sole Crop (Paddy-wheat).

Keywords: Small farmers, Rohtak district, Food, Fruit, Milk

INTRODUCTION

Small and marginal farmers constitute 85 % of the total farming community and are the core of the Indian rural economy. There are about 115 million operational holdings in India and 80 % are marginal and small farmers. To fulfill the basic needs of house hold including food (cereal, pulses, oilseeds, milk, fruit, honey, meat, etc.), feed, fodder, fiber, etc. warrant an attention about Integrated Farming System (IFS).Integrated farming system integrates livestock, crop production, poultry, tree crops, fishery, plantation crops and other systems that complement each other. Integrated farming system is a sustainable agricultural system that is based on the concept that 'there is no waste' and 'waste is only a misplaced resource'. In IFS waste from one component becomes an input for another part of the system. Undoubtedly, most of the farmers are doing farming since long back but their main emphasis and focus was individual components ie crop production but not in an integrated manner. Integrated farming system (IFS) is recognized as a solution to the continuous increase of demand for food production, providing stability to the income and nutritional security particularly for the small and marginal farmers with limited resources. Integrated farming system was an appropriate approach to minimize risk and increase the production, profit and employment with better utilization of resources (Dhaka *et al.*, 2009).IFS have revalorised conventional farming of livestock, aquaculture, horticulture, agro-industry and allied activities in some countries, including India. Research on integrated crop and livestock systems has found to be highly productive and environmentally sustainable (Allen *et al.*, 2005, 2007; Russelle *et al.*, 2007). The resource characterization study revealed that/ha improvement in profitability varied from Rs 20,000 to 25,000 under irrigated condition, resource recycling improve fertility led to 5 to 10 q/ha crop yield increase, generate 50-75 man days/ family/ year and reduce the cost of production by Rs.500-1,000/ha. They further revealed improvement in the net profit margin varying from 30-50 %.(Manjunatha *et al.*, 2014). The farmers have become aware about integrated farming systems fairly and widely about each and every component. They have faced several

*Corresponding Author

constraints. In Haryana, Singh *et al* (1999) conducted studies of various farming systems on 1 ha of irrigated and 1.5 ha of unirrigated land and found that under irrigated conditions of mixed farming with crossbred cows yielded the highest net profit (Rs 20,581/-) followed by mixed farming with buffaloes (Rs 6,218/-) and lowest in arable farming (Rs 4,615/-). In another study conducted with 240 farmers of Rohtak (wheat-sugarcane), Hisar (wheat-cotton) and Bhiwani (gram-bajra) districts in Haryana which represented zones of different crop rotations revealed that maximum returns (Rs/ha) of 12,593, 6,746 and 2,317 were obtained from 1 ha with buffaloes in Rohtak, Hisar and Bhiwani, respectively. The highest net returns from Rohtak was attributed to the existence of a better soil fertility type and of irrigation facilities coupled with better control measures compared to other zones. The present study was formulated with the objectives to compare the economics of integrated farming system with conventional cropping system and to identify the problems faced by the integrated farming system farmers in various enterprises.

MATERIALS AND METHODS

Twenty five farmers of Rohtak district were interviewed to collect information regarding various components of IFS each of crop alone, crop+ dairy, crop + horticulture, crop + vegetable, Crop + Fishery, Crop + horticulture + vegetables and crop +dairy integrated farming systems were selected for giving proportionate allocation to the available integrated farms in 5 villages. The present study confined to Rohtak district in which five blocks i.e. Kalanaur, Meham, Rohtak, Sampla and Lakhan Majra blocks. In this context 5 farmers from each block of Rohtak district has been selected randomly which have adopted Integrated Farming System. Simplier tabular analysis was done for calculating the economics of various enterprises.Details of various enterprises of Integrated Farming System in 1.5 ha in mentioned in table 1. Constraints faced by the farmers related to integrated farming system as a whole and as related to individual enterprises were assessed and the details are presented in table 3.

Table 1. Details of various enterprises of Integrated Farming System in 1.5 ha

Sr. No.	Enterprise	Details
1	Sole crop	0.50 ha Paddy-wheat
2	Crop + Vegetable	0.70 ha Paddy-Wheat 0.40 ha tomato 0.40 ha bottle guard
3	Crop + Horticulture	0.40 ha guava orchard 1.1 ha Paddy-Wheat
4	Crop + Fishery	1.3 ha Paddy-Wheat 0.20 ha Fish farming *Crop yield was poor due to high water table
5	Crop + Dairy	1.2 ha Paddy-Wheat 6 buffalos and 4 cows crossbred (Dairy unit)
6	Crop + Vegetable + Horticulture	0.7 ha Paddy – wheat 0.40 ha Vegetables 0.40 ha Horticulture (Guava orchard)

RESULTS AND DISCUSSION

Among various IFS components highest BC ratio was recorded with Crop + Vegetable + Horticulture (1.72) followed by Crop + Dairy (1.67) and Crop + Vegetable (1.63). Lowest B: C was observed in Crop + Fishery. This is due to lower crop yield in areas where fishery is practiced.

A sample of 25 farm households each of Crop alone, Crop + Dairy, crop + horticulture, crop + vegetable, Crop + Fishery, Crop + horticulture + vegetables and crop +dairy integrated farming systems were selected for giving proportionate allocation to the available integrated farms in 5 villages. The respondents were asked to indicate the problems faced by them. The problems enlisted were ranked based on Likert scale.

It was observed during survey that all the selected farmers were not adopted integrated farming system at farm level. Only some farmers were found to adopt horticulture, vegetables and fishery along with crop production. The non adoption of Integrated Farming System at overall farm level in general could be due to various reasons. Some of the constraints faced by farmers had been presented in Table 3. The constraints analysis was reported based on the opinion survey of the sample farmers. Constraints were identified on the basis of their rating them as severe, moderate and least in adopting different enterprise combinations and the number of farmers reporting the said constraints was multiplied by 3, 2 and 1 respectively to find the extent of severity. As per the opinion of farmers they faced

problems in IFS in different extent. The main constraint faced by farmers were "Lack of marketing facilities at local level and low price for produce" (Rank I) followed by "Unavailability of skilled labourand its high wages" (Rank II), "Heavy investment required at initial stage" (Rank III),"High care and management required for maintenance of different enterprises "(Rank IV),"Timely non availability of inputs and costly inputs "(Rank V), "Irregular supply of electricity" (Rank VI) and "Lack of infrastructural facility" (Rank VII) respectively. All the above mentioned constraints seemed to commonly exist in various parts of the Rohtak district. Similar were the findings of Younus (2013), Balusamy*et al.* (2003)and Sanjeev*et al* (2011).

Table 2. Economics of integrated farming system of Rohtak District

Sr. No.	Enterprises	Total cost (Rs)	Gross return (Rs)	B:C
1	Sole Crop (Paddy-wheat)	274631	3,86,269	1.41
2	Crop + Dairy	787243	1316950	1.67
3	Crop + vegetable	301779	491719	1.63
4	Crop + Horticulture	297595	456816	1.54
5	Crop + Fishery	238544	319182	1.34
6	Crop + Vegetable + Horticulture	348557	598057	1.72

Table 3. Constraints faced by farmers of Rohtak District in adopting integrated farming system (N=25)

Sr No.	Constraints in integrated farming system	Total weighted score	Weighted mean score	Rank Order
1	Lack of marketing facilities at local level and low price for produce	71	2.84	I
2	Unavailability of skilled labourand its high wages	66	2.64	II
3	Heavy investment required at initial stage	64	2.56	III
4	High care and management required for maintenance of different enterprises	61	2.44	IV
5	Timely non availability of inputs and costly inputs	60	2.40	V
6	Irregular supply of electricity	57	2.28	VI
7	Lack of infrastructural facility	56	2.24	VII

CONCLUSION

Among various enterprises highest BC ratio was recorded with Crop + Vegetable + Horticulture followed by Crop + Dairy which is 21.98 % and 18.43 % higher than Sole Crop (Paddy-wheat). Therefore, the IFS model of Crop + Vegetable + Horticulture should be encouraged under agro-climatic conditions of Rohtak district for increasing the farmer's income. The most important constraint faced by farmers in adopting integrated farming system was lack of marketing facilities at local level and low price for produce followed by unavailability of skilled labour and its high wages and heavy investment required at initial stage.

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