Indian Journal of Extension Education
Vol. 50, No. 1 & 2, 2014 (59-62)

Integrated Farming Systems Approach for Income Enhancement and Employment Generation in North-West India

Ravinder Singh[1] and T. S. Riar[2]

ABSTRACT

A study was conducted during 2011-12 in Punjab to find out the productivity, profitability and employment generation of integrated farming system as compared to conventional cropping system. The study comprised of two integrated farming systems *viz.*, crop + floriculture and crop + bee-keeping. Both these integrated farming systems were productive and profitable than that of sole cropping system. The net returns increased in the tune of 29.53 per cent and 19.09 per cent per hectare with inclusion of floriculture and bee-keeping enterprises, respectively over sole cropping system. The study also indicated that crop + floriculture farming system generated 31.03 mandays/hectare/annum/farm employment for family, 46.14 mandays/hectare/annum/farm for hired labour and 77.17 mandays/hectare/annum/farm as total labour. In case of crop + bee-keeping, it was observed that employment generated through crop + bee-keeping farming system for family labour was 29.61 mandays/hectare/annum/farm, for hired labour was 40.12 mandays/hectare/annum/farm and for total labour was 69.73 mandays/hectare/annum/farm.

Key words : Integrated farming systems, income enhancement, employment generation

INTRODUCTION

Punjab is one of the leading states of Indian agriculture. The progressive status of state is passing through complex problems such as soil degradation, declining water table, appearance of multi-nutrient deficiencies, which is further coupled with effects of climate changes. The modern agricultural practices, which are heavily dependent on the use of chemical pesticides, inorganic fertilizers and growth regulators has raised the agricultural production manifold but at the cost of resource depletion, environmental deterioration and loss of crop diversity. The major reasons for these problems are the continuous cultivation of wheat-paddy, excessive use of insecticides, pesticides, weedicides *etc*. and other wrong farming patterns. To overcome the problems and to make the agriculture profitable, there is a need to shift from paddy pattern to alternative crops like cotton, maize, pulses, oil seeds, fruits, vegetables *etc*. There is also need to encourage other enterprises like beekeeping, mushroom cultivation and livestock rearing for additional income generation. Therefore, the present concern is to ensure the livelihood security, which can be very safely attained by following the farming system approach. Farming system approach is adequate combination of different enterprises, which interact with environment and agriculture inputs without dislocating the ecology on one hand and meeting the national goal on other.

It is a pre-requisite in farming system to ensure the efficient recycling of resources particularly crop residues, because 80-90 per cent of the micronutrients remains in the biomass (Gill *et al.,* 2011).Integrated farming system represents a complicated interwoven mesh of soil, plant, livestock, workers, farm inputs and environmental influences (Shekinah and Sankaran, 2007). Among the different system variables, some of these are necessary to manipulate as per the need of the area as well as system approach for making it more productive according to their preferences and aspirations. The integration of crop and animals enables synergistic interaction, which has a greater total contribution than the sum of their individual effects (Edwards *et al.,* 1988). Various farming system approaches are being practiced by the farmers of Punjab which fulfill their needs by maintaining balance of ecology. They manage farm enterprises like crops, dairying, poultry, fishery, sericulture, piggery, tree crops etc. in such a way that they could get more profit from all the enterprises and field. The present study was planned to assess the profitability and employment generation in different integrated farming systems.

METHODOLOGY

The comprehensive study was conducted during 2011-12. The Punjab Agricultural University confers prizes to progressive farmers' at farmers fair for the

[1]M.Sc scholar, [2]Associate Professor, Dept. of Extension Education, Punjab Agricultural University, Ludhiana (Punjab)

adoption of latest technologies and this concept was started in 1997 in memory of a progressive farmer, Sardar Dalip Singh Dhaliwal. The first award was started by the family of Sardar Dalip Singh Dhaliwal in 1997 by donating the funds for this purpose. Other awards namely 'Chief Minister Award (Agriculture), Chief Minister Award (Horticulture), Parwasi Bhartiya Award, Ujagar Singh Dhaliwal Award and Surjit Singh Dhillon Award, Sardarni Jagbir Kaur Memorial Awards were instituted by Punjab Agricultural University later on. A fool proof system of selecting the farmers for awards has been developed by the university. Since 1997, forty-nine farmers have been awarded for their excellent performance in agricultural activities.

All these awardee farmers till 2011 by Punjab Agricultural University, Ludhiana, Punjab were selected as respondents. A list of respondents was taken from Directorate of Extension Education, Punjab Agricultural University, Ludhiana for the study. It comprises of 60 awardee farmers for their achievements in agriculture sector. The respondents were belonged to Bathinda, Tarantaran, Muktsar, Gurdaspur, Patiala, Roopnagar, Moga, Sangrur, Kapurthala, Ferozpur, Barnala, Ludhiana, Amritsar, Ropar, Jalandhar, Nawasehar, Faridkot and Hoshiarpur districts of Punjab State.

An appropriate questionnaire was prepared as per the objectives of the study to collect the data from the respondents. Questionnaire was prepared for the data collection based on the criteria approved by Punjab Agricultural University, Ludhiana for selection of the farmers for the various awards. It includes items related to assessment of net income of successful farmers with different farming systems. It also includes items saluted to the assessment of employment generation both family labour and hired labour through different farming system. Proper precautions were taken to ensure unbiased response of the respondents by providing them necessary instructions after explaining the objectives of study. The present study comprised of two farming systems *i.e.,* crop + floriculture and crop + bee-keeping. It dealt with comparison of profitability and employment generation through these farming systems.

RESULTS AND DISCUSSION

The data presented in Table 1 indicated that net returns from only crops per hectare in crops + floriculture farming system were ₹ 62,631 but with floriculture the net returns per hectare increased to ₹ 91,824. There was 29.53 per cent per hectare increase in the net returns due to addition of floriculture over crop system. Similarly, in case of crops + beekeeping farming system (Table 2) the net returns from only crops per hectare was ₹ 59,723 but with second enterprise *i.e.* beekeeping the net return increases to ₹ 73,816 per hectare. There was 19.09 per cent per hectare increase in net returns. This increase in net returns is due to income flow from beekeeping by selling of honey and by-products and low input costs. Gill *et al.,* (2011) reported that there are a number of farmers who are running these farms in profitable ways by the use of modern and stable techniques.

The fodder fed to the cattle produces milk. The dung, urine and litter produce farmyard manure and energy used for crops and fish pond. The siltation of fish pond is utilized as manure to crops. The farmyard manure can substitute about 25 per cent of recommended N, P and K for crops, besides improving the physical and biological properties of soil. Various farming system approaches are being practiced by the farmers of Punjab which fulfill their needs by maintaining balance of ecology. They manage farm enterprises like crops, dairying, poultry, fishery, sericulture, piggery, tree crops etc. in such a way that they could get more profit from all the enterprises and field.

In any integrated farming system, engagement of year-round farm labours including family members irrespective of gender and age, is generally more as compared with conventional cropping system alone which has been reflected in this study (Table 3,4). Data presented in Table 3 showed that employment generated through crop + floriculture farming system for family labour was 624.19 mandays/annum/farm (41.71%) and for hired 872.43 mandays/annum/farm (58.29%). Floriculture increased the family labour by 25.18 man days/annum/farm, hired labour by 33.18 man days/annum/farm and total labour by 29.84 man days/annum/farm. In crop + floriculture farming system, employment for family labour generated was 31.03 man days/hectare/annum/farm, for hired labour was 46.14 mandays/hectare/annum/farm and for total labour was 77.17 mandays/hectare/annum/farm.

It was observed from Table 4 that employment generated through crop + bee-keeping farming system for family labour was 461.16 man/days/annum/farm (42.53%) and for hired labour 623.18 mandays/annum/farm (57.47%). Bee-keeping increased the family labour by 14.56 mandays/annum/ farm, hired labour by 14.85 man days/annum/farm and total labour by 14.73 man/days/annum/farm. Employment generated through crop + bee-keeping farming system for family labour was 29.61 man/days/hectare/annum/farm, for hired labour was 40.12 man/days/hectare/annum/farm and for total labour was 69.73 man/ days/hectare /

annum/farm. Gill *et. al.* (2011) reported that integrated farming system requires more labour comparative to wheat-paddy farming system. In wheat-paddy farming system mainly labour is required in sowing and harvesting time but in integrated farming system labour is required throughout the year. Farmers take only two crops in wheat-paddy farming system but farmers take more than two crops, so more employment is generated through integrated farming system. Combining crop with livestock enterprises would increase the labour requirement significantly and would help in reducing the problems of under employment to a great extent Integrated farming system provide enough scope to employ family labour round the year. At the farm of Bhupinder Singh at village Virk, the dairy enterprise could gave ₹ 10,761/ha and poultry also enhanced the margin to ₹ 11,546/ha. This enterprise could generate additional manpower of 173 mandays/annum.

Table 1: Returns from crop + floriculture.

Area under crops	25.18 ha	
Area under floriculture	8.87 ha	
Cost Items	₹/farm	₹/ha
Crops		
Seed	71184	2827
FYM & Fertilizers	131540	5224
Plant Protection	60860	2417
Irrigation charges	61817	2455
Fuel & Mobile Oil	86191	3423
Hired-in labour	178577	7092
Land rent	172080	6834
Miscellaneous	148738	5907
Total	910987	36179
Interest on variable cost	45549	1809
Total Variable cost	956537	37988
Interest on fixed capital	36034	2543
Depreciation on fixed capital	31401	2216
Total fixed cost	67435	4759
Total cost	1023972	42747
Returns from Crops		
Gross Returns	2653418	105378
Total cost	1023972	42747
Net Returns	1629446	62631
Floriculture: Costs		
Seed	2812	
FYM & Fertilizers	24934	
Plant Protection	15549	
Labour charges	309182	
Miscellaneous	20108	
Interest on working capital	18629	
Fixed cost	4896	
Total	396109	
Returns from floriculture		
Gross Returns	1078787	
Total cost	396109	
Net Returns	682678	
Total net returns from crops and floriculture per farm	2312124	
Total net returns from crops and floriculture per hectare	**91824**	
Additional net returns due to floriculture/farm	**682678**	
Percentage increase in net returns due to floriculture/farm	**29.53%**	

Table 2: Returns from crop + bee-keeping.

Area under crops	17.84 ha	
No. of bee boxes	122.86	
Cost Items	₹/farm	₹./ha
Crops		
Seed	48239	2704
FYM & Fertilizers	91394	5123
Plant Protection	44386	2488
Irrigation charges	39480	2213
Fuel & Mobile Oil	65277	3659
Hired-in labour	128680	7213
Land rent	119421	6694
Miscellaneous	103294	5790
Total	640171	35884
Interest on variable cost	32009	1794
Total Variable cost	672179	37678
Interest on fixed capital	54562	3058
Depreciation on fixed capital	49184	2757
Total fixed cost	103746	5815
Total cost	775925	43494
Returns from Crops		
Gross Returns	1841391	103217
Total cost	775925	43494
Net Returns	1065466	59723
Bee-keeping: Costs		
Labour	26422	
Wax sheets	37160	
Sugar	4182	
Sulphur	405	
Boxes' round	9456	
Miscellaneous	1381	
Total	79005	
Interest on variable cost	3950	
Interest on fixed capital	35160	
Depreciation on fixed capital	35160	
Total Cost	232280	
Returns from Bee-Keeping		
Gross Returns	483698	
Total cost	232280	
Net Returns	251418	
Total net returns from crops and bee-keeping per farm	1316884	
Total net returns from crops and bee-keeping per hectare	**73816**	
Additional net returns due to bee-keeping/farm	**251418**	
Percentage increase in net returns due to bee-keeping/farm	**19.09%**	

Table 3: Employment generation through crop + floriculture.

Enterprise	(Mandays/Annum/farm)					
	Family Labour		Hired Labour		Total Labour	
	Days	%	Days	%	Days	%
Crops	624.19	41.71	872.43	58.29	1496.62	100.00
Floriculture	157.15	35.19	289.45	64.81	446.60	100.00
Crops+Floriculture	781.34	40.21	1161.88	59.79	1943.22	100.00
% increase/farm	25.18%		33.18%		29.84%	
Per ha employment	31.03		46.14		77.17	

Table 4: Employment generation through crop + bee-keeping.

Enterprise	(Mandays/Annum/farm)					
	Family Labour		Hired Labour		Total Labour	
	Days	%	Days	%	Days	%
Crops	461.16	42.53	623.18	57.47	1084.34	100.00
Bee-Keeping	67.15	42.05	92.54	57.95	159.69	100.00
Crops + Bee-Keeping	528.31	42.47	715.72	57.53	1244.03	100.00
% increase/farm	14.56%		14.85%		14.73%	
Per ha employment	29.61		40.12		69.73	

CONCLUSION

Thus, it can be concluded that integrated farming system is the only way to get more profits from the agriculture and to generate the human labour as compared to mono-cropping. Integrated farming system on one hand increases economic yield per unit area per unit time by virtue of intensification of crop and allied enterprises, provides flow of money to the farmer round the year, make the agriculture profitable and on other hand it is very helpful in reducing the problems of under employment. Farmers can earn higher profit margins and can generate more employment opportunities by adopting integrated farming systems approach. Integrated farming system also reduces the cost of production by recycling the residues in the field and helps to conserve water, soil health and nutrients.

Paper received on : August 20, 2014
Accepted on : September 23, 2014

REFERENCES

Channabasavanna, A.S., Itnal, C.J. and Patil, S.G. 2002. Productivity, economic analysis and changes in physicochemical properties of soil as influenced by integrated rice based farming systems. *Indian J. Agron.* 47(1): 1-5.

Etward, K 2003. The importance of integration in sustainability agricultural systems. *Agriculture Ecosystem and Env*. 27: 25-35.

Gill, M.S., Samra, J.S. and Singh, 2005. Integrated farming system for realizing high productivity under shallow water-table conditions. Research Bulletins, Department of Agronomy, PAU, Ludhiana, pp. 1-29

Gill, M.S., Singh, J.P. and Gangwar, K.S. 2009. Integrated farming system and agriculture sustainability. *Indian J. Agron*. 54: 128-39.

Ramrao, W.Y., Tiwari, S.P. and Singh, P. 2006. Crop-livestock integrated farming system for the marginal farmers in rain fed regions of Chhattisgarh in central India. *Livestock Res. for Rural* Dev.: 55-58.

Shekinah, D. and Sankaran, J 2007. Productivity, profitability and employment generation in integrated farming systems for rainfed vertisols of western zone of Tamil Nadu. *Indian J. Prod.* 52: 275:78.

Singh, S. P., Gangwar, B. and Singh, M. P. 2009. Economics of Farming Systems in Uttar Pradesh, *Agricultural Economics Research Review* 22 :129-138.