

Comparative Study of Integrated Farming System – A Case Study

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ABSTRACT - The present study indicating the income gap between crops based farming system and fishery based farming system that was conducted at Krishi Vigyan Kendra, Ganiwan, Chitrakoot districts of Uttar Pradesh and compared with farmers practice. Data were collected from the IFS unit of KVK farm and compared with crop based farming system of same area and farmer's field of three different locations. The existing integrated farming systems in the area were Crop + Horticulture. The area covered under this farming system was 2.5 acre each. The study revealed that the farming system integrated with fishery activity able to generate 2.60 time extra employment and 3.66 times more income in terms of money as compared with Crop – horti based farming system. The income was in between Rs. 97324/-, 88400/- and Rs.71550/- from 2.5 acre area and created 195,195, and 172 mandys employment in a year at farmers field. It is found that fishery based farming system generated 512 man days employment and gross income was up to Rs. 458659/- per year as compared to crop based farming system which generate employment for 197 man days and gross income up to Rs. 107264/- from 2.5 acre area.

Key words- Integrated farming, Crop based farming, socio economic status, Employment generation.

Introduction

Agricultural occupation now seems to the non profitable activity in this agrarian country. The farming commonly depends upon crops more than 70%. The government of India has started several programmes in a mission mode and set a target to double the farmer's income up to Year 2022 in a sustainable manner. 112 district of India selected as aspirational district which are most economically, socially and educationally backward in developmental process. Chitrakoot is one of the districts among them. The livelihood development and food security is one of the important issues for thousands of the house hold suffering from malnutrition. Farmer and his family members did not show interest to involve themselves in agricultural works and migrate toward big cities in search of jobs. The Chitrakoot district characterized by mono cropping, where the cropping intensity was about 103%. The integrated farming system and diversification is one of the option to enhance the income of farm families and also able to generate employment and It is also able to migration check as well as upgrade socio economic status. The integrated farming system is very broad system which includes crop, vegetables, fruits, live stock, Fisheries and some small scale enterprises like mushroom, beekeeping, food processing etc. The Integrated farming system is beneficial for living environment as for IFS it enhance the quality of soil, utilize or recycle the byproduct of different component of the system. It will help in decreasing air pollution, improves water quality and enhance the soil fertility and finally increase total output in a sustainable manner.

A sustainable technology is the need of the hour for higher production from existing agricultural land and water. In this regard, integrated farming offers a possible solution and holds a great promise and potential for augmenting production, betterment of rural economy and employment generation, and finally improving socio-economic status of weaker rural community. For long sustainability of the production potential there is a need to integrate all available resources and production system to each other. This integration not optimizes the production but also reduces the system oriented pollutions. Indian agriculture possesses the responsibility of providing national as well as household food and nutritional security to its swarming millions. The linear growth in population and unplanned colonization lead to rapid fragmentation of land holdings and shrinkage in fertile cultivated land. In India, more than 70 per cent of the total population of the country still live in villages and mainly depend on agriculture and/or related enterprises. Marginal and small farmers constitute more than 84 per cent of the 115 million operational holdings in India which are cultivating only 29 per cent of the arable land. The integration of aquaculture with live stock and crop farming offers great efficiency in resource utilization reduces risk by diversifying crop and provides additional food and income.

The advantages of IFS are pooling and sharing of resources / input, efficient use of family labour, conservation, preservation and utilization of farm biomass including non conventional feed and fodder resource, effective use of organics, regulation of soil fertility and soil health, income and employment generation for many people to increase in economic status by utilization of under –utilized resources in an efficient and remunerative manner.

Farming system approach envisages the integration of agro forestry, horticulture, dairy, sheep and goat rearing, fishery, poultry, pigeon, biogas, mushroom, sericulture and by-product utilization of crops with the main goal of increasing the income and standard of living of small and marginal farmers. Integrated systems are about bringing crops and livestock into an interactive relationship with the expectation that together, as opposed to alone, they will generate positive effects on outcomes of interest, such as profitability overall productivity, and conservation of non-renewable resources. Systems also reflect natural resources available and the impact on their use, wildlife issues, target and non-target plant and animal species, micro-organisms, and indeed all of the definable and indefinable factors that ultimately interact to result in an outcome that is never constant. The integrated farming system approach is considered to be the most powerful tool for enhancing profitability of farming systems, especially for small and marginal farmers to make them copious.

The aims of IFS are to increased productivity, profitability, sustainability, balanced food, clean environment, recycling of resources income round the year. The major part of this system is adoption of new technology for solving energy, fuel and fodder crises. This technology also involves avoiding deforestation to increase employment generation and Input-output efficiency. It also enhanced opportunity for agriculture oriented industries and standard of living of the farmers.

Material and methods

Chitrakoot District lies between Lat. 24° 48' to 25° 12' N and Long. 80° 58' to 81° 34' E comprising an area of 338897 ha and only 14700 ha are sown more than once in a year. The district is surrounded by Banda, Kaushambi, Fatehpur, Allahabad, Rewa, Satna and Chhattarpur district from its periphery. As per census the total population was 991697 and 59.03 % farmers falls under marginal categories having less than one hectare land. The irrigated area was also 37.56 % of total cultivable land. The district enriched with four type of soil namely Mar, Roker, Kavar and sandy loam. The district comes under Central Plateau & Hills Region (Bundelkhand) agroclimatic zone receiving an average annual rainfall of 850MM and ambient temperature ranges between 04 °C to 48 °C. The majority of farm family (59%) possesses one ha (2.5 acre) land in the district. The area under each model was 2.5 acre. The present study was conducted at KVK, Chitrakoot to know the feasibility of integrated farming system for those farmers. A crop – Hort and fishery based farming system model were selected for study and it was compared with traditional farming system of three farmers from different location having same area. The data was collected and analyzed scientifically. In Crop based farming system cereals, oilseeds, pulses and vegetables are grown in 2.50 acre area throughout the year at KVK, farm and data of fishery based integrated farming system was collected from KVK, IFS unit, in this system fish farming integrated with guava, Lemon, Pomegranate, Jackfruit, Brinjal, Tomato, Beans, sponge guard, bottle guard on either bunds. An agro forestry system also developed on bunds eucalyptus, teak and Pigeon pea grown on bunds. Three farmer of village Lodhvara, Itraur and Baihar selected for personnel interview who adopted crop based farming system at their own field. All crops are grown scientifically with standard package of practices. The Yield data were collected farmer wise and compared with Model adopted at KVK. The cost of cultivation and productivity along with cost benefit ratio were also evaluated of the system.

Result and Discussion-

Productivity and profitability-

The integrated farming system suitable for particular agro climatic area is depending upon accurate planning and its execution at field level. Before finalization and adoption of farming system it is very essential to know the present cropping system, requirement of food and its choices with proper marketing strategies. The traditional cropping pattern in selected villages is mainly Rice – wheat/gram, Fallow – lentil/mustard/chick pea mixed with oilseed crops. Very few farmers are cultivating vegetables nearer to urban area. The productivity of different crops is very low. If we go through benefit cost ratio that is very less in traditional farming system. The present study based on the economic and employment performance of crop based farming both on farmers field and KVK, center and it is compared with fishery based integrated farming system at KVK, Chitrakoot in 2.5 acre area. The study indicated that at KVK, farm crop based farming system conducted in 2.5 acre area, the production, income and expenditure data was collected and analyzed. It was found that cereals, oilseeds, pulses and vegetables were grown in all season. The gross income was Rs. 107264/- with B:C ratio of 2.16. Whereas the average gross income from farmers field was Rs 82228/- with B:C ratio 2.60. The result of fishery based farming system indicates that the gross income of Rs.458659 obtained with B:C ratio of 2.95. If we see the farmer wise performance it was observed that Shri RR Tripathi farmer of lodwara village got the profit of Rs 88024/- with B:C ratio of 2.29 and Sri Sri Harish Chandra farmer of Village Itraur obtained gross income Rs.88700/- and B:C ratio was 2.85. Whereas farmer of Baihar village Sri Babbu got the gross income of Rs. 69960/- and B:C ratio was 2.76. The profitability of

fishery based farming system was much better than crop based farming both at KVK and farmers field. Reuse of waste products was the most advantage of integrated farming. Fishery based integrated farming was showing positive results in all means and system was highly profitable. Radhammani et al. [1] described IFS as concepts of minimizing risk, increasing production and profits along with improving the utilization of organic wastes and crop residues.

Employment and Income opportunity

The fishery based integrated farming system provides more employment opportunities to the rural people. 512 people got employment with fish feeding, mushroom, fruits and vegetable cultivation practices, harvesting and marketing of products and fish seed production. About 100 rural people also got seasonal job in association with this type of fishery based integrated farming. Crop based farming system at KVK creates 197 man days employment, whereas at farmers field employment creation was in between 172-195 man days in a year. Fishery based Integrated farming shows better employment opportunity and income generation. The income was about Rs. 236983/- higher than the crop based farming at KVK, farm and Rs.242843/- more than farmer's field in terms of net income. Integrated farming system offer solution to the problems of land and food crisis. As paddy and plant cultivation needs more intensive irrigation, presence of farm ponds becomes highly significant in the era of climate change. Farm ponds help to improve the living conditions of farmers. These types of water harvesting structures are economically and socially acceptable [2]. The integration of aquaculture with live stock and crop farming offers great efficiency in resource utilization reduces risk by diversifying crop and provides additional food and income. On an average 350 to 450 man-days are generated from each hectare of Rice based farming system in terms of investment of family labor[3]. Family absorption of 470 man-days reported by MSSRF. [4]and 373 man-days [5] has been reported from different kinds of farming systems.

Table :1- Performance of crop based farming system at KVK

S.No.	Crop/Variety	Area (acre)	Production (Q.)	Income (Rs.)	Expenditure (Rs.)	Net income (Rs.)	Mandays	B:C Ratio
1	Paddy	0.80	8.76	13864	4710	9154	197	2.16
2	Green gram	0.30	1.85	10175	3500	6675		
3	Pigeon pea	--	1.24	3720	1500	2220		
4	Sesame	0.20	1.05	6300	2689	3611		
5	Paddy straw	--	10.12	500	100	400		
6	Wheat	0.8	15.54	23310	12540	10770		
7	Chick pea	0.4	3.45	14200	5890	8310		
8	Lentil	0.2	1.68	5880	2584	3296		
9	Linseed	0.2	1.19	4760	1958	2802		
10	Vegetable	0.5	11.00	16500	8690	7810		
11	Vegetable pea	0.4	2.88 pod 2.07 seed	8055	5410	2645		
	Total :	2.5		107264	49571	57693		

Table :2- Performance of Fishery based farming system at KVK

Crop	Area (Acre)	Yield	Expenditure (Rs.)	Gross Income (Rs.)	Net Income (Rs.)	Man days	B:C ratio
Fish	2.5	5459000	150654	439960	289306	512	2.95
Fruits vegetables,Mushrooms		955 Kg	3642	14999	3670		
Pulses		137 Kg	1260	3700	1700		
Total			155556	458659	294676		

Table : 3Performance of crop based farming system at Farmers Field

Name	Crop	Area (Acre)	Prod. (Q.)	Exp.	Gross Income	Net Income	Man days	B:C ratio
Sri R.Raman Tripathi Vill-Lodhwara	Cereals	2.5	37	24158	51800	27642	172	
	Pulses		6.9	8280	20700	12420		
	Vegetables		5.10	6054	15524	9470		
	Total			38452	88024	49532		2.29
Sri Harish Chandra Vill-Itraur	Cereals	2.5	20	13000	28000	15000	195	
	Pulses		10.8	9391	32400	23009		
	Vegetables		10	8696	28300	19304		
	Total			31087	88700	57313		2.85
Sri Babbu Vill- Baihar	Cereals	2.5	14.4	7107	20160	13053	170	
	Oilseeds		2.0	1954	6000	4046		
	Pulses		11.6	12336	32800	23464		
	Vegetables		12.0	3909	11000	8091		
	Total			25306	69960	48654		2.76

The involvement of farmers and their family members and helped to get more jobs in different components. The present study reveals that farm fishery based farming system more helpful to increase income and good employment opportunities. The process of integrated fish farming is environment friendly and economically viable in the locality, so it will sustain for long time and in addition to that it became possible to empower the rural woman by making them financially independent [6]. It has been established that Integrated Farming System (IFS) focuses on increasing farm productivity by increasing diversification, resource integration and creating market linkages. Due to the rapid increase in the population and the decrease of agricultural land, no single farm enterprise is likely to be able to sustain the small and

marginal farmers without resorting to integrated farming systems for generating adequate income and gainful employment year round [7]. Highest gross and net return with maximum employment generation (100 days) was obtained in the module having fish and horticulture component [8].

Conclusion-

The integrated farming system attempted to fulfill the gaps between the improved and traditional production systems and this model has had its impact in many ways. Recycling, conservation and utilization of natural resources and establishing balance agro eco system This model able to generate income every time as per requirement due to various farming components. The integrated farming system made efficient utilization of products, by-products and also wastes generated on the either farm components. Integrated farming system always gives higher returns than traditional cropping system as such it may be replicated to other farmers across the country based on the availability of the water resource. Farmer can keep in practice the concept of recycling of resources more efficiently, it is necessary to study the linkages and interdependence of the components, the knowledge of which will help to develop farming system in which the waste of one enterprise is more efficiently used as input in another enterprise within the system. This system will be able to minimize risk, generation of extra employment, viable and check migration. It was concluded that adoption of full IFS approach is better than traditional and partial integrated farming with reference to productivity, profitability, economics and employment generation for small and marginal farmers.

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BIOGRAPHIES-



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