Integrated Farming System in District Banda:
A Micro Analysis

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ABSTRACT

A multistage purposively cum random sampling technique was adopted for the sampling and data from 50 farmers of five villages from the selected district were collected and analysed using statistical tools to reach the below discussed results. It was found that the vegetable crop enterprises have given the highest net income of the different farms compared to other enterprises of the different farms like cereal crops as wheat and paddy, dairy, poultry and goatary etc. While cereals crop enterprises have given the highest employment of different farms compared to other enterprises of different farms. Among crops + dairy + vegetable based farming systems has given the highest average net income of different types of farms like as ₹ 128117.31, ₹ 165001.61 and ₹ 186147.39 on the marginal farms, small farms and large farms respectively; compared to other integrated farming systems models and crops + dairy + vegetable integrated farming systems models has given the highest employment 262 days on the marginal farms, 285 days on the small farms and 315 days on the large farms compared to other farming systems models. The average employment 287 days has given by this integrated IFS models.

HIGHLIGHTS

⊙ The highest average net income achieved was through crops + dairy + vegetable farming systems.
⊙ The highest level of employments, 287 days on average, was generated through crops + dairy + vegetable mix enterprises.

Keywords: Integrated farming system, income, employment

In recent year, food security, livelihood security, water security as well as natural conservation and environment protection have emerged as major issues worldwide. Within broad concept of sustainable agriculture "Integrated Farming System'' hold special positions as in this system, nothing is wasted; the by-product of practices become the input for others. It is an integrated approach to farming as compare to existing monoculture approaches. The farming system approach has emerged as a major theme for agricultural research

and farmers' development in fore-coming years however it is not new. An under standing of existing farming system is an essential prerequisite for formulating sensible innovations for achieving agricultural economic development. The integrated systems represent that reduce erosion, increases crop yield, soil biological

activities and nutrient recycling, intensify land use. Mixed farming systems are understood to exist where both livestock and crop production take place within the same locality. Integration of livestock and crop allow nutrient to be recycled more effectively on the farm. The highly improved integrated crop-livestock systems can guarantee more sustainable production, (Patel et al, 2015).

Contribution of different combination of enterprises such as poultry, fishery, sheep and goat and horticultural; with crop and dairy as, base enterprises have been analysed for their impact on farmers'. Positive correlation was observed between total income and socio- economic factors like land holding; permanent assets creation, food security, nutritional security, employment generation, marketing behaviour and livestock respectively. The adoption of multiple farm enterprises in an integrated manner can ensure a substantial income generation to sustain livelihood of farmers over the meagre income from self-standing enterprises as revealed from this study. The focus of present government is a doubling farmer income by 2022. The adoption of IFS is a right approach in this direction and should be supported through institution, extension, policies and marketing intervention in a system approach, (Ponnusamy *et al.* 2017).

Integrated farming system improves economic condition of the small and marginal farmers which enhanced the education, health and social obligations and overall improvement in livelihood security, (Gupta *et al.* 2020). If poor women invest in small livestock and the household step by step gets out of poverty, (Soni *et al.* 2014). This will be a great practice for allover socioeconomic development of the practitioners. Integrated farming systems approach not only enhances the income of the farm household but also provide an off-farm employment opportunity for small and marginal farmers to certain extent. The integrated farming systems generate economic empowerment Income and employment, (Singh *et al.* 2020).

It is concluded that the integrated farming system (IFS) is a promising enterprise for the marginal and small farmers particularly who has less farm holdings. The IFS provide progressive economic growth, employment opportunities, family nutritional requirements, optimal utilization of resources of the farming enterprises etc. Hence measures to be taken to document such kinds of farming system models and to disseminate to the needy farmers. Although the integrated farming system has certain constraints the scientific community and research station has to initiate steps to alleviate such problems of the farmers to improve their standard of living and income, (Sasikala *et al.* 2015).

RESEARCH METHODOLOGY

A multistage purposively cum random sampling technique was adopted to select the district, block, villages and farmers. The Bundelkhand region have several districts such as Jhansi, Banda, Hamirpur, Mahoba, Chitrakoot, Lalitpur and Jalaun. District Banda was selected purposively keeping in view the convenience of the investigator. Farmers in the selected area are adopting the integration of the farming systems for the enhancement of their farming business. Such as cultivation of crops, vegetable, animal husbandry, poultry farming, goat-rearing, fishery etc. It is the second stage of sampling technique. A list of all development blocks of the district Banda was prepared and among the eight development blocks of district Banda. One block namely Badokhar-khurd was selected purposively for the research. The selected block represents the best agro-economic condition in the Banda district. A list of all villages practices the different farming systems in block Badokhar-khurd was prepared. Out of this, five villages were selected randomly for the study purpose. A total number of 50 farmers were selected randomly from the universe of 5 villages on the proportion of the farmer's falling in each village under different size group of farms. These farmers were grouped according to the landholdings they possess, that are marginal farmer's (0-1 hectare) and small farmer's (1-2 hectare) and large farmer's (more than 2ha).

Method of inquiry and collection of data

The primary data were collected by personal interview with selected farmers on well- prepared schedules and the secondary data were collected from published

material, journal, books record of block, *tehsil* and district head quarter, district statistical record and records from lekhpal and other officials.

ANALYTICAL TOOLS

(a) Tabular analysis

The tabular analysis was used to compare the values of returns, input and output ratio and income and employment of different enterprises.

(b) Averages

Weighted average

$$W.A. = \frac{\Sigma W_i X_i}{\Sigma W_i}$$

Where,

W. A. = Weighted average

X_i = Variable

W_i = Weight of variable

Arithmetic mean

$$\bar{X} = \frac{\Sigma X}{N}$$

$$Percentage = \frac{Part\ value}{Total\ value} \times 100$$

The research on integrated farming systems used averages on the different farm of group for the different component of enterprises. The farmers were categorized on the basis of land holding, i.e., marginal farm (<1 ha.), small farmers (1-2 ha.) and large farmers (>2 ha.).

RESULTS AND FINDINGS

The input, output and net income of different enterprises have been worked out for measuring the farm economy of different sizes and is given below in table 1. The farmers of the study area were using different combination of enterprises mix or farming systems. The enterprise analysis of different farming systems reflect that the vegetable farming is very a remunerative enterprise among all because vegetables crops fetched out highest net-incomes overall components of enterprises while second rank on cereal crop, third rank on the dairy, fourth rank on the goatary and poultry enterprise was on fifth position at the farmer field of the study area.

Table 2 shows that highest average net-income was achieved through crops + dairy + vegetable farming systems followed by crops +dairy + goatary farming systems at all three sizes group of farms. The crops + dairy + poultry was third remunerative farming systems followed by fourth rank of crops + poultry + goatary farming systems in the study area.

Level of employment

The level of employment of a farm family is mainly

Table 1: Enterprises Used by Farmers in different Farms (₹)

Particulars	Marginal farm			Small farm			Large farm		
	Input	Output	Net income	Input	Output	Net income	Input	Output	Net income
CROPS									
Paddy/ha	44280.29	75414.15	31133.86	53632.05	98472.45	44840.40	55232.38	105219.55	49987.17
Wheat/ha	55609.41	93520.00	37910.59	62593.52	107148.00	44554.48	66887.90	117900.00	51012.08
VEGETABLE									
Onion/ha	56344.28	127050.00	70705.72	67365.96	154770.00	87404.04	69063.67	162470.00	93406.33
DAIRY									
Per cow	14775.50	35250.00	20474.50	17741.22	45825.00	28083.78	21207.66	54990.00	33782.34
Per buffalo	18445.73	43750.00	25304.27	26333.52	64050.00	37716.48	29361.95	80062.50	50700.55
POULTRY									
Per 5 birds	1757.90	3020.00	1262.10	1971.38	3294.00	1322.62	2098.08	3583.00	1484.92
GOATARY									
Per goat	6436.87	12045.00	5608.13	7666.40	17390.15	9723.75	9001.46	21463.48	12462.02

Table 2: Average level of net income from different farming systems (₹)

Combination/Farming Systems	Marginal	Small	Large
Crops + Dairy +Vegetables	128117.31	165001.61	186147.39
Crops + Dairy + Goatary	63019.72	87321.32	105203.08
Crops + Dairy + Poultry	58673.69	78920.19	94225.98
Crops + Poultry + Goatary	41392.43	55743.81	64446.56

Table 3: Employment days over different enterprises in a year

Particulars	Marginal	Small	Large
Crops	142	150	169
Vegetables	30	40	45
Dairy	90	95	100
Poultry	15	20	23
Goatary	20	25	28
Total days	297	330	365

Table 4: Level of employment on different types of farming systems in a year (days)

Combination	Marginal	Small	large	Average
Crops	142	150	169	153
Dairy	90	95	100	95
Vegetables	30	40	46	38
Total	262	285	315	287
Crops	142	150	169	153
Dairy	90	95	100	95
Goatary	20	25	28	24
Total	252	270	297	273
Crops	142	150	169	153
Dairy	90	95	100	95
Poultry	15	20	23	19
Total	247	265	292	268
Crops	142	150	169	153
Goatary	20	25	28	24
Poultry	15	20	23	19
Total	177	195	220	197

determined by the size of farm business, intensity of cropping and combining of different types of farming systems adopted by different size group of farmers. The level of employment of human labour days on the different size group of farms is given in given below table.

Table 3 presents the status of employment days generated from different enterprise at the different size group of farms. The highest employment days was generated through crops followed by dairy, vegetable, goatary and poultry. The status of employment was maximum at large group of farms followed by small and marginal farmers.

Table 4 shows that the average highest level of employments, 287 days was generated through crops + dairy + vegetable mix enterprise, followed by 273 days by crops + dairy + goatary farming systems and 268 days through crops + dairy + poultry. The lowest employment, 197 days generation was observed through crops + goatary + poultry farming system approach in the study area.
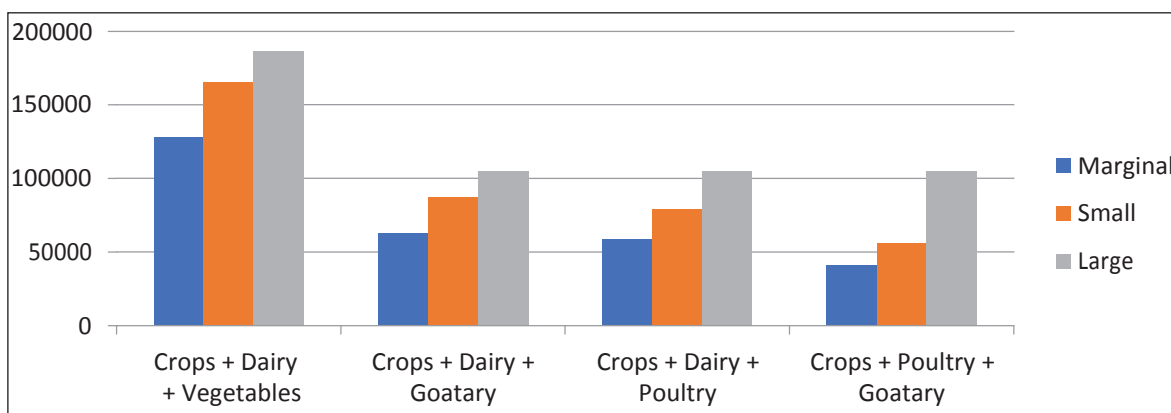
Graph for the table 3
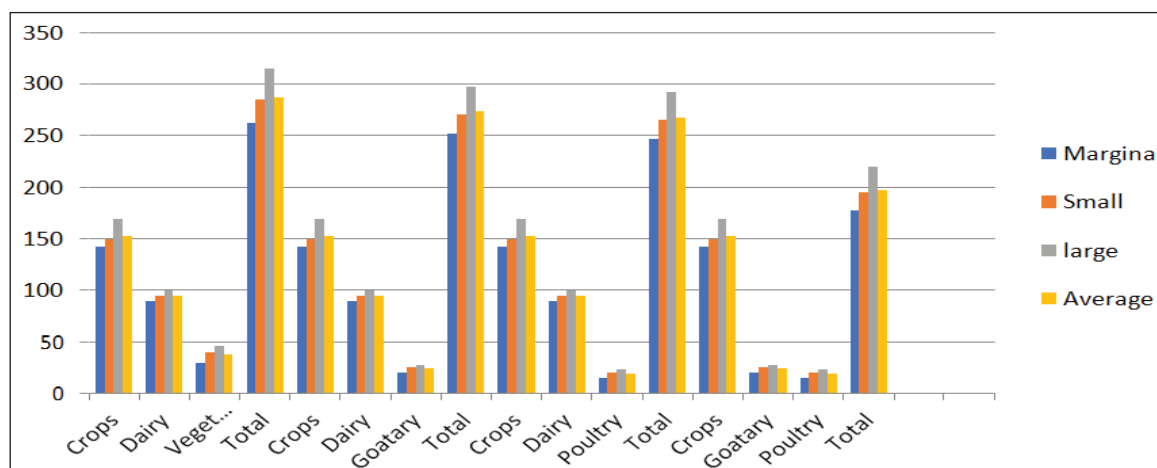
Graph for the table 4

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