

## Research Article

# Sustainable integrated farming system in Wardha district of Vidarbha

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**SUMMARY :** The present study was undertaken in Wardha district of Vidarbha region with sample size of 120 respondents from 12 villages. Data were collected regarding farming systems adopted by the farmers and the economics of all farming systems with the help of pre structured and pretested interview schedule. It was found that cent per cent respondents had adopted agriculture and dairy farming followed by vegetables cultivation (83.33%) and fruit crops (65.00%). Agriculture and all allied enterprises were found beneficial in farmers' situation. It is inferred that vermicomposting had given maximum net profit with B:C ratio 4.89. It was followed by backyard poultry (3.34), apiculture (2.82), forage crop (2.71), sericulture (2.42), agriculture (2.28) and goat rearing (2.21). All above enterprises were giving more than two rupees on expenditure of one rupee. Below two rupees, fruit crops, vegetable crops and dairy farming were giving 1.76, 1.56 and 1.38 B:C ratio, respectively.

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**KEY WORDS:**

Integrated farming system

## BACKGROUND AND OBJECTIVES

Indian economy is predominantly rural and agriculture oriented where the declining trend in the average size of the farm holding poses a serious problem. In agriculture 84.00 per cent of the holding is less than 2 acres. Majority of them are dry lands and even irrigated areas depend on the vagaries of monsoon. In this context, if farmers concentrated on crop production they will be subjected to a high degree of uncertainty in income and employment. Hence, it is imperative to evolve suitable strategy for augmenting the income of the small and marginal farmers by combining to increase the productivity and supplement the income. In an agricultural country like India, the average land holding is very small. The population is steadily increasing without any possibility of increase in land area. The income from cropping for an average farmer is hardly sufficient to sustain his family. The farmer has to be assured of a regular income for a reasonable standard of living by

including other enterprises.

In view of the above facts there is strong need to commercialize agriculture and in order to ensure an all round development of farming, families farming should be considered as a system in which crop and other enterprises that are compatible and complimentary are combined together. The study of farming systems and application of farming systems approaches can bring a ray of hope for the betterment of farmers. Keeping all these factors in mind, the present study was conducted to suggest which particular mixture of crop, dairy and other farming systems can provide maximum benefit.

## RESOURCES AND METHODS

The present study was carried out in Wardha district of Maharashtra State, where sample of 120 respondents from 12 villages were purposively selected who had been adopted farming system other than agriculture or subsystem of agriculture.

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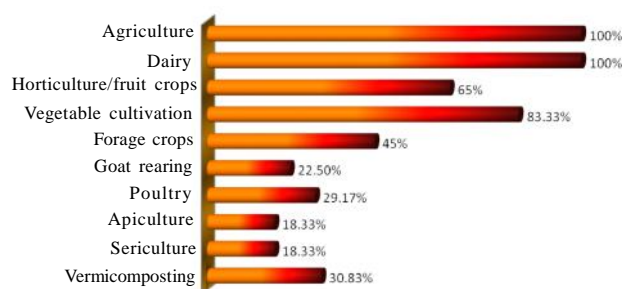
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Exploratory research design was used for investigation. For the present study interview schedule was found to be most convenient method for data collection from the farmers. Findings regarding adoption of farming system in relation to selected variables *viz.*, age, education, land holding, farming experience, sources of information, mass media participation, extension participation, organizational participation, economic motivation, innovativeness and risk orientation were included in study.

## OBSERVATIONS AND ANALYSIS

It is observed from the Fig. 1 that almost all the respondents have adopted agriculture and dairy farming followed by vegetable cultivation by 100 respondents (83.33%), horticulture by 65.00 per cent respondents, forage crops by 45 per cent respondents. Sericulture farming systems were adopted by only 18.33 per cent respondents in the study.



**Fig. 1: Distribution of respondents according to their adoption of different farming systems**

It is revealed from Table 1 that dairy farming is highly compatible with agriculture (Index value 95) just below this vermicomposting was found to be compatible with index value of 94 followed by backyard poultry (Index value 91), goat

rearing (Index value 90) and forage crop cultivation (Index value 89). Apiculture and sericulture were found to be compatible at 86 per cent and 82 per cent, respectively. Vegetables farming and fruit crops farming were found compatible at 74 per cent and 68 per cent with the agriculture. It clearly indicated that the enterprise which requires more water and its economic production was regulated by the water were having lower compatibility with the agriculture (Singh and Baruah, 2012).

**Table 1 : Compatibility of different farming systems with agriculture**

Sr. No.	Farming system	Compatibility index
2.	Dairy	95
3.	fruit crops	68
4.	Vegetable cultivation	74
5.	Forage crops	89
6.	Goat rearing	90
7.	Poultry (Backyard)	91
8.	Apiculture	86
9.	Sericulture	82
10.	Vermicomposting	94

### Economic analysis of different farming systems :

Agriculture and all allied enterprises presented in Table 2 were found beneficial in farmers' situation. It is inferred that among all ten farming systems vermicomposting had given maximum net profit with B:C ratio 4.89. It was followed by backyard poultry (3.34), apiculture (2.82), forage crop (2.71), sericulture (2.42), agriculture (2.28) and goat rearing (2.21). All above enterprises were giving more than two rupees on expenditure of one rupee. Below two, fruit crops, vegetable crops and dairy farming were giving 1.76, 1.56 and 1.38 B:C ratio, respectively. Similar work on the related topic was also

**Table 2: Economics of different farming system**

Sr. No.	Farming system	Average total income (Rs.)	Average total expdt. (Rs.)	Average net profit (Rs.)	Average B:C ratio
1.	Agriculture	173833	83760	90073	2.28
2.	Dairy farming	139143	102743	36399	1.38
3.	Fruit crop	306590	188167	118423	1.76
4.	Vegetable crops	30983	19531	11339	1.56
5.	Forage crops	58642	23454	35188	2.71
6.	Goat rearing	26478	12500	13978	2.21
7.	Backyard poultry	3955	1200	2755	3.34
8.	Apiculture	36415	13067	23348	2.82
9.	Sericulture	61663	25581	36082	2.42
10.	Vermicomposting	46878	9781	37097	4.89

done by Deoghore and Bhattacharya (1993 and 1994 a and b).

### Integrated farming system model:

The model of integrated farming system given in Fig. 1 is the combination of various farming systems such as vermicomposting (B:C ratio = 4.89), backyard poultry (B:C ratio = 3.34), apiculture (B:C ratio = 2.82), forage crops (B:C ratio = 2.71), sericulture (B:C ratio = 2.42) with agriculture (B:C ratio = 2.28) and dairy farming (B:C ratio = 1.38) are complementary to each other and helps to generate more income that improves socio-economic status of farmers (Kumar *et al.*, 1994).

On the basis of benefit-cost ratio and combination of different farming systems complementary to each other in farmers' situation, the above model is prepared which is beneficial to almost all farmers (Singh *et al.*, 1993; Patil and Udo, 1997). Vermicomposting helps to generate income by selling vermicompost and vermiculture which provide maximum net return to the farmers. Labour requirement of vermicomposting was also very low, even women member can manage it very effectively. It also provides manure of high fertility status to their own farms. Therefore, it was complementary to the agriculture enterprise.

Sole crop or intercropping of forage crops like sorghum and maize also provide additional benefits in the form of economic produce and bi-produce. It was complementary to agriculture and dairy farming. Even though the dairy farming requires more labour and skilled workers, it provides milk, better monetary returns and family health. It also provides FYM for manuring the crops. It clearly indicated that dairy farming was very important in integration of farming systems as a best complementary enterprise to the other farming systems.

Backyard poultry was found very effective, supplementary and domestic enterprise which can be handled by even old or child members of family. It could provide egg and meat which is liked by almost all non-vegetarians. Backyard poultry provided bound income to the women members of the family which contributed in their economic empowerment, its B:C ratio was also found very high. Apiculture was also found to be a good subsidiary occupation in combination with agriculture. It requires no labour which can be managed by any family member with some training. Sericulture is one of the farming systems which provided better returns to the farm family in addition to the agriculture.

Integration of different farming systems were also found beneficial by Ramrao *et al.* (2005), Sharma *et al.* (2008); Channabasavanna *et al.* (2009) and Gill *et al.* (2009) in their research of different States.

Irrespective of B:C ratio compatibility of farmers and complementary combination of different farming system was prepared for the farmers of Wardha district which is given in Fig. 2.



Fig. 2: Model of integrated farming systems

### Conclusion :

It is concluded that the farmers from Wardha district can adopt the complementary enterprises and make integration of agriculture + dairy + vermicomposting + backyard poultry + apiculture + forage crop + sericulture which was found beneficial on the basis of B:C ratio and compatibility index .

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