RESEARCH ARTICLE :

Relationship between socio-economic characteristics of IFS farmers and perception of usefulness of integrated farming system (IFS)

■ **D. Channamallikarjuna and A. T. Patil**

SUMMARY : The present study was conducted in Belagavi, Dharwad, Haveri and Uttar Kannada districts of northern Karnataka. The total sample size for the study was 160 integrated farming system (IFS) farmers. The *Ex-post-facto* research design was adopted for study. Findings of the study revealed that that nearly half of the IFS farmers belonged to middle age group, studied upto high school, IFS farmers belonged to low land holding, low income group. Majority of them belonged to medium experience category, material possession of the farmers was found to be medium with high economic motivation. Majority of the IFS farmers belonged to medium innovative proneness, risk orientation, mass media utilization, extension contact and training received belonged to low level. Majority of the farmers visited the nearest town once in fortnight. Among thirteen independent variables studied eight variables namely farming experience, material possession, economic motivation, innovative proneness, risk orientation, mass media utilization, extension contact and cosmopolitiness exhibited positive and significant relationship with perception of usefulness of IFS by farmers.

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Author for correspondence :

D. Channamallikarjuna
Department of Agricultural Extension Education, University of Agricultural Sciences, Dharwad (Karnataka) India
Email: channa.agri@ gmail.com

See end of the article for authors' affiliations

BACKGROUND AND OBJECTIVES

India with 2.4 per cent of the global geographical area, 16 per cent of the world human population and more than 55 per cent of population (Anonymous, 2013) dependent on agriculture in one or the other way. Indian agriculture is the biggest sector in the country and plays a key role in the socio-economic growth of the country. India has made significant progress in food grain production. The production of food grains, which was 50.8 million tonnes in 1950-51 rose to 272 million tonnes, which consists of 38.06 million tonnes of oil seeds, 105 million tonnes of rice, 96.96 million tonnes of wheat and 22.95 million tonnes of pulses (Anonymous, 2014). India is also the second largest producer of vegetables and fruits, representing 8.6 and 10.9 per cent of overall production, respectively. This was mainly due to the use of high yielding verities, fertilizers and irrigation. Similarly, government policies on food grain production played an important role in making the "green revolution"

successful and the country has become self reliant in food grain production.

The linear growth in population and unplanned colonization lead to rapid fragmentation of land holdings and shrinkage in fertile cultivated land. Marginal and small farmers constitute more than 84.00 per cent of the 115 million operational holdings in India which are cultivating only 29.00 per cent of the arable land (Singh *et al.,* 2011). The small land holders are better contributors to the total production (78.00 %) but weak in terms of generating adequate income and sustaining their own livelihood. Small holding (below 0.8 ha) does not generate enough income to keep a farm family out of poverty despite high productivity (Chand *et al.*, 2011). Growth in human and livestock populations has led to an expansion of cultivated land and shortened fallow periods.

Integrated farming systems (IFS) has got more relevance in the present day to reap up better harvests in the long run by maintaining a productive resource base on a holistic approach. The IFS approach introduces a change in the farming techniques for maximum production in the cropping pattern and takes care of optimal utilization of resources. The farm wastes are better recycled for productive purposes and judicious mix of agricultural enterprises like dairying, poultry, mushroom, piggery and fishery which suits to the local agro-climatic situations and socio-economic status of farmer would bring in prosperity in the farming. Indian agriculture is characterized by mixed farming, involving a system of combining crop production with one or more livestock enterprises like rearing of cattle, buffalo, sheep and goat. In integrated farming systems, the by-products of livestock are used in crop production as to supplement nutrients for crop growth and crop residues, fodder and green forages are used as livestock feed.

RESOURCES AND METHODS

The present study was conducted in Belagavi, Dharwad, Haveri and Uttar Kannada districts of northern Karnataka during the year 2017-18. The research design adopted for the study was Expost-facto-research design. Data collection was done through personal interview method with the help of interview schedule. Socio-economic characteristics of IFS farmers and perception of usefulness of integrated farming system (IFS) by the farmers for the study 160 IFS farmers formed the population of the study. Scale was developed for

measuring perception of usefulness of IFS by farmers. The finale scale consists of 42 statements. These statements were administered to 160 farmers to assess their perception of usefulness of IFS. Responses of farmers was recorded on a five point continuum *viz.,* strongly agree, agree, undecided, disagree and strongly disagree with scores 5, 4, 3, 2, 1, respectively. The total perception score for individual respondent was calculated by summing up the number of sub items as perceived by the individual farmers. Thus, 210 and 42 were the maximum and minimum scores, respectively, obtainable by the farmers. The data collected from respondents was scored, tabulated and analyzed using suitable statistical tools such as frequency, percentage, mean, SD and correlation.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Age:

As it is seen in Table 1 that, majority of the respondents (49.37 %) were middle age group, while 31.87 per cent were old age group and 18.75 per cent were of young age group. This might be due to farmers of the middle aged are more enthusiastic and tend to had more family responsibility and were more involved in the farming occupation. It could also be that young generation is less interested in agriculture and were more attracted to non-farm occupation. It could also be due to the facts that parents might be encouraging the children to go for higher education and to take up non-farm occupation. The old age farmers might have less physical stamina to withstand the hard work and hence less efficient and less involved in farming activity. The results are inline with the findings of Mangala (2008).

Education:

The data in Table 1 revealed that twenty five per cent (25.00 %) of the farmers studied upto high school, whereas, 20.00 per cent of the farmers studied upto middle school, followed by 18.75 per cent of the farmers Illiterate, while, 14.37 per cent of the farmers studied upto primary school, whereas 12.50 per cent of the farmers studied upto pre-university and 9.37 per cent of the farmers graduated.

Relationship between socio-economic characteristics of IFS farmers & perception of usefulness of integrated farming system (IFS)

Table 1: Profile characteristics of the IFS farmers (n=160)

Sr. No.	Variable	Category	Frequency	Percentage
1.	Age	Young age (upto 35 yrs)	30	18.75
		Middle age (36-50 yrs)	79	49.37
		Old age (above 50 yrs)	51	31.87
2.	Education	Illiterate	30	18.75
		Primary school	23	14.37
		Middle school	32	20.00
		High School	40	25.00
		Pre-university	20	12.50
		Graduate	15	9.37
3.	Land holding (ha)	Low (< 4.26)	69	43.13
		Medium (4.26 to 8.59)	52	32.50
		High (>8.59)	39	24.38
4.	Family income	Low (< Rs. 150907)	66	41.25
		Medium (Rs. 150907 to 338480)	56	35.00
		High (> Rs. 338481)	38	23.75
5.	Farming experience	Low (< 11.47 years)	39	24.37
		Medium (11.47-22.86 years)	69	43.12
		High (> 22.87 years)	52	32.50
			$\bar{x} = 19.32$	SD = 9.95
6.	Material possession	Low (<5.41)	57	35.63
		Medium (5.41 to 8.18)	61	38.13
		High (>8.18)	42	26.25
			$\bar{x} = 6.80$	SD = 3.25
7.	Economic motivation	Low (<11.96)	44	27.50
		Medium (11.96 to 14.55)	52	32.50
		High (> 14.55)	64	40.00
			$\bar{x} = 13.26$	SD = 3.04
8.	Innovativeproneness	Low (<7.93)	55	34.38
		Medium (7.93 to 10.11)	66	41.25
		High (> 10.11)	39	24.37
			$\bar{x} = 9.02$	SD = 2.57
9.	Risk orientation	Low (< 10.66)	46	28.75
		Medium (10.66 to 14.35)	59	36.88
		High (> 14.35)	55	34.38
			$\bar{x} = 12.50$	SD = 4.35
10.	Mass media utilization	Low (<3.55)	48	30.00
		Medium (3.55 to 5.24)	71	44.38
		High (>5.24)	41	25.63
			$\bar{x} = 4.4$	SD = 1.99
11.	Extension contact	Low (<3.75)	52	32.50
		Medium (3.75 to 5.74)	67	41.88
		High (> 5.74)	41	25.63
			$\bar{x} = 4.75$	SD = 3.15

Table 1: Contd…………

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12.	Training participation	Low (< 0.44)	73	45.63
		Medium (0.44 to 1.18)	49	30.63
		High (> 1.18)	38	23.75
			$\bar{x} = 0.81$	SD = 0.88
13.	Cosmopolitiness	Number of visit to town		
		Once in a week	29	18.12
		Once in a fortnight	92	57.50
		Once in a month	29	18.12
		Occasionally	10	6.25

In general, results showed that majority of the farmers (85.00 %) had formal education. The government policy of free education upto high school might be the reason for increase in the education level. Educated farmers come across with many sources of information and gain more knowledge about the outside world, in view of their tendency to know more about many things, an educated farmer will be in a better position to collect, interpret and utilize and relate information in day to day life. Few of them opted for higher education reflecting on their affordability and interest to learn more and gain knowledge The results are in line with the finding of the studies reported by Shanabhoga (2016) and Chandrashekar (2016).

Land holding:

Table 1 revealed that the more than forty (43.13 %) of the farmers possessed a land holding upto 4.26 acres followed, by more than one-third (32.50 %) of farmers possessed land holding upto 4.27 to 8.59 acres and 24.38 per cent of the farmers possessed more than 8.59 acres of land holding. The proportion of respondents had land holding upto 4.26 acres was found higher in almost all integrated farming systems reflected the attraction of marginal and small farmers towards integrated farming systems. They were more prone to integrate more enterprises in order to increase income from small area of land. The similar findings were also reported in the research studies of Argade (2014).

Family income:

The data in Table 1 revealed that more than forty per cent (41.25%) of farmers belonged to low income level followed by medium income (35.00%) and high income (23.75%). It is very interesting to note that the annual income levels of IFS farmers had increased by

practicing the integrated farming system. This can be explained with the fact that farming is always a gambling with monsoon and hence, horticulture component might have replaced the field crops. Further, dairy and goat rearing are always profitable to farmers because of the regular income and easy availability of fodder with horticulture orchards. Further, they are also the source of income on regular basis for family commitments to farm women and provide additional employment to family labours. The findings of the study fall in line with the results of Mangala (2008) and Shwetha (2012).

Farming experience:

The results in Table 1 indicated that 43.12 per cent of the farmers belonged to medium experience category (11–23 years). While, 32.50 per cent of farmers had high experience (>23 years). Whereas, 24.37 per cent of the farmers belonged (<11 years) to low experience. The reason for majority of respondents belonged to medium experience category might be that by birth farmers are being dependent on agriculture profession and also inherited culture of farmers from generation to generation to follow the traditional agricultural experience. The results are in accordance with the findings of Naik (2007) and Mangala (2008).

Material possession:

The result presented in Table 1 revealed that 38.13 per cent of the farmers belonged to medium level of material possession, followed by low (35.63 %) and (26.25%) to high level category. Machinery like tractor, tractor mounted equipments, power sprayer and other high efficiency and improved machines were owned by the farmers with large land holding as these machinery/ equipments involves advanced technology. The results are in conformity with findings of Kudari (2014).

Economic motivation:

Table 1 clearly showed that about 40.00 per cent of farmers had high economic motivation. It was satisfying to note that more than one third (32.50 %) of the farmers had medium economic motivation and 27.50 per cent of the farmers were in low economic motivation category. This might be due to the higher returns and round the year employment generation from integrated farming systems made them to have high economic motivation. Similar findings were reported by Natikar (2001); Mangala (2008) and Argade (2014).

Innovative proneness:

Table 1 revealed that 41.25 per cent of the respondents belonged to medium level of innovative proneness category. While, 34.38 and 24.37 per cent of the respondents belonged to low and high innovative proneness categories, respectively. The reason might be that, since majority of IFS farmers belonged to small land holding, low to medium income group, middle age group category and medium cosmopoliteness in nature. Further, IFS practices involves more enterprises and majority of farmers prefers to know new ideas and to adopt new technologies. It may also may be due to various psychological factors acting on individual, which exert more pressure and make them to adopt under favourable environmental condition and hence, this kind of result obtained. The findings of the study are in consonance with the findings of Sidram (2008) and Lavanya (2010).

Risk orientation:

It is clear from Table 1 revealed that more than one third 36.88 per cent of the farmers had medium risk orientation. Whereas, 34.38 and 28.75 per cent of them had high and low level of risk orientation, respectively. The risk bearing capacity of individuals depend upon the personal, psychological, socio-economic characteristics. The individuals with more farming experience, better land holding and better income might have exhibited medium and high risk orientation. These could have contributed for the present finding. Similar result was reported by Yeshwanth Kumar (2008) and Binkadakatti (2013).

Mass media utilization:

From Table 1 observed that nearly forty five per cent of the farmers had medium mass media exposure followed by low (30.00%) and high (25.63%) mass media exposure, respectively. An overall view of mass media utilization revealed medium to low utilization of respondents. Moreover, average educational qualification of respondents might have contributed to the importance of the mass media as a source to gather information. To be a successful entrepreneur one needs day to day information regarding market behaviour, government policies, technologies available etc. It might have contributed to the above results. The findings are in line with the findings of Hinge (2009) and Kiran and Sandhya Shenoy (2010).

Extension contact:

It is conformed that Table 1 also revealed that more than forty per cent (41.88 %) of the farmers had medium level of extension contact, followed by low (32.50 %) and high (25.63 %) categories. The extension personnel were not available to give expert advice to the farmer's problems at right time. However, 26.00 per cent of the IFS farmers had contact with extension personnel because of different subsidy programmes. The findings of the above study are also in line with the findings of Binkadakatti (2013) and Singh *et al.* (2017).

Training:

The results shown in the Table 1 revealed that, forty five per cent of the farmers had received low training, followed by 30.63 per cent and 23.75 per cent of farmers belonged to medium and high category, respectively of farmers received in training. The probable reason for the above trend might be due to their low extension contact with extension functionaries working in university extension functionaries, department of agriculture and NGO'S and voluntary organization. And less exposure to various activities in agriculture. The results are in confirmation with the findings reported by Kumar *et al.* (2011).

Cosmopolitiness:

The data revealed that in Table 1 indicated that, maximum of 57.50 per cent of the respondents visited the nearest town 'once in fortnight', followed by 18.12 per cent of the respondents visited the town 'once in month' and 'once in a week', respectively and least of 6.25 per cent visited the town 'occasionally' to get information or involvement towards the integrated farming system. Cosmopoliteness is the degree to which a farmer is oriented outside his community to seek information. Big and medium farmers when compared

to small farmers had higher cosmopoliteness due to their sound economic conditions, thereby leading to their active participation in extension activities like tours, exhibitions, krishimelas and the like and also due to their higher social participation. The results are in conformity with the findings of Lavanya (2010).

Distribution of farmers according to their overall perception of usefulness of IFS:

Distribution of according to their overall perception of usefulness of IFS by farmers was showed in the Table 2 that more than two fifth (44.38 %) of IFS farmers belonged to medium perceived usefulness category, whereas, 35.00 per cent of IFS farmers belonged to high perceived usefulness category and 20.63 per cent of IFS farmers belonged to low perceived usefulness category.

It indicated that the combination of different enterprises will certainly result in enhanced income and employment and reduced the risks involved in the farming systems as perceived by the farmers. Irrespective of farming systems, the farmers who had more enterprise combinations, perceived high level of reduction in vulnerability in conventional farming as compared to the farmers had less enterprise combination.

Table 2: Distribution of overall perception of farmers towards integrated farming systems (n = 160)

Sr. No.	Category	Frequency	Per cent
1.	Low (Mean – 0.425 SD)	33	20.63
2.	Medium (Mean ± 0.425 SD)	71	44.38
3.	High (Mean + 0.425 SD)	56	35.00
		Mean : 155.45	SD : 29.22

Diversified and rather intensive nature of multifarious activities related to different enterprises included in the IFS model provide a lot of opportunities of employment and keeps farmers and their family members engaged whole the year and as such can help in solving unemployment problem of the country mainly in rural youths, the integrated system is the combination that reduces erosion, increases crop yields, soil biological activity and nutrient recycling, helps in efficient use of water, reduces pest and diseases, intensifies land use, improving profits and can, therefore, help reduce poverty and malnutrition and strengthen environmental sustainability. These findings are in line with the earlier studies of Radhammani *et al.* (2003); Fraser *et al.* (2005) and Singh *et al.* (2011).

Relationship between independent variables of the farmers and perception of usefulness of IFS:

A perusal of results of correlation analysis presented in Table 3 revealed that out of thirteen independent variables studied eight variables namely farming experience, material possession, economic motivation, innovative proneness, risk orientation, mass media utilization, extension contact and cosmopolitiness exhibited positive and significant relationship at 0.01 level of probability, age and training received did not show significant relationship with perception of IFS farmers.

Table 3: Relationship between perception and socio-economic characteristics of IFS farmers (n = 160)

Characteristics	'r'- value
Age	0.93NS
Education	0.210*
Land holding	0.192*
Family income	0.179*
Farming experience	0.262**
Material possession	0.289**
Economic motivation	0.363**
Innovative proneness	0.379**
Risk orientation	0.250**
Mass media utilization	0.380**
Extension contact	0.344**
Training	0.88NS
Cosmopolitiness	0.319**

* and ** indicate significance of values at $P=0.05$ and 0.01, resepectively   NS=Non-significant

The possible reasons may be farming experience also increases. This includes them to integrate animal enterprises with crop production to avoid risk in farming. The exposure to outside because of cosmopolite nature and extension contact might have created awareness about different enterprises. Innovativeness and mass media helps them to search new ideas and information material possession and economic motivation helps to increase the productivity, profitability and employment generation from animal husbandry and cultivation.

While, the three variables namely education, land holding and family income exhibited positively significant relationship at 0.05 level of probability with perception of usefulness of IFS by farmers. The possible reasons may be education opens the avenues for different opportunities and rational thinking which might have influenced integrated farming system. Further, more land

holding provide the choice for the individuals to diversify their farm related activities and also help them to take up the enterprises on a economic viable mode and this might have influenced in getting more income, the income in turn influences the livelihood security. The present study gets the conformity with the findings of Lavanya (2010) and Shwetha (2012).

Conclusion:

The study indicated that farmers were having medium level of perception towards the IFS. The findings of the study also indicate that perception of usefulness of IFS by farmers has been significantly influenced by farming experience, material possession, economic motivation, innovative proneness, risk orientation, mass media utilization, extension contact and cosmopolitiness exhibited positive significant relationship with perception of usefulness of IFS by farmers. The significant R^2 value revealed that these eleven variables taken together explained a highly significant difference in the levels of perception of farmers.

Authors' affiliations :

A.T. Patil, Department of Agricultural Extension Education, University of Agricultural Sciences, Dharwad (Karnataka) India

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