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## Awareness of farmers towards integrated farming system

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### Abstract

The study entitled, 'Awareness of farmers towards integrated farming system' was carried out in Parbhani district of Marathwada region of Maharashtra state. A total of 120 farmers were considered as respondents for the present study. The data regarding the extent of awareness about the meaning of IFS among the respondents revealed that 60.83 per cent of the respondent farmers had partial awareness about meaning of IFS while awareness of the farmers about IFS combines various agro-supplementary occupations, 62.50 per cent of them respondents were partially aware about it. Whereas 50.00 per cent of the respondents partially aware about IFS saves costs and increase productivity by recycling the resources available in one agribusiness to another. Regarding awareness of the respondents about various models of IFS, 44.17 per cent of the respondents were completely aware about IFS model - Cropping system + Cow / Buffalo Rearing + Vermicompost Production + Fruit Cultivation + Vegetables Cultivation whereas 38.33 per cent of the respondents were unaware about IFS model - Crop System + Cow / Buffalo Rearing / Poultry + Fruit Cultivation, 38.33 per cent of the respondents were not aware about this model. Data also shows that 39.16 per cent of the respondents were medium level of awareness regarding IFS, followed by high level awareness about IFS (36.67%) and 24.16 per cent of them were unaware about IFS concept. In case of constraints about IFS, lack of technical knowledge about IFS were expressed by 91.67 per cent of the respondents, followed by adverse weather conditions and rainfall uncertainty was expressed by 87.50 per cent respondents. Whereas, constraints of unavailability of quality raw material on time for IFS was expressed by 66.67 per cent of the respondents. Regarding market-oriented constraints in IFS, 91.67 per cent of the respondents were expressed the constraints of price fluctuations of agricultural produce, followed by 85.00 per cent of the respondents were expressed the constraints of lack of market facilities at the village level. Majority of the respondents suggested to remove broker / middleman in marketing system of agricultural products (95.83%), followed by government can support to fetch a reasonable price to agriculture produce in the market suggested by 93.33 per cent of the respondents. Agriculture marketing facilities should be strengthened is suggested by 92.50 per cent of the respondents, 91.67 per cent of them suggested make availability of quality inputs at the village level related IFS and regular power supply to agriculture.

**Keywords:** Integrated farming system, awareness, constraints, suggestions

### Introduction

The Indian economy is mainly oriented towards agriculture. Operational farming in India continues to decline. The declining trend of per capita land availability poses a serious challenge to the sustainability and profitability of farming (Siddeswaran, *et al.* 2012) <sup>[4]</sup>. As the population of the country increase, more and more, there is practically no scope for horizontal expansion of land for food production. Vertical expansion is only possible through the integration of appropriate agricultural components that require less space and time to ensure reasonable periodic income for farm families (Gill, *et al.* 2005) <sup>[1]</sup>. From the Green Revolution onwards, farmers have mainly concentrated on single-enterprise farming systems that lead to deterioration in soil health, increased risk of crop failure, and downward trends in productivity (Rahman and Sarkar, 2012) <sup>[3]</sup>. Rapid population growth, urbanization and income growth in developing countries like India, the demand for food of animal origin is increasing, while besides aggravating the competition between crops and livestock (increasing cropping areas and reducing rangelands). A system approach it is need of the hour for fulfilling the demand of constantly increasing population without disturbing the ecological balance.

An integrated farming system appears to be the possible solution to the continued increase in demand for food production, income stability, and nutritional security, especially for small and marginal farmers with limited resources. It is not only a reliable way to get a fairly high productivity with a substantial fertilizer economy, but also a concept of ecological soundness,

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leading to sustainable agriculture.

As per the awareness of integrated farming system by farmers, it is first-hand information about the existence of an individual's facts, activity, or process. For understanding the extent to which the respondents are aware of the information about the integrated farming system, it is necessary for further development of integrated farming system in the area. Keeping the above facts in mind, the present study was designed to understand the level of awareness of farmers with respect to the integrated farming system. The following specific objectives were formulated for the study:

### Objectives

1. To study the extent of awareness of integrated farming system among the respondents.
2. To study the constraints faced and suggestions given by the respondents about integrated farming system.

### Materials and Methods

The present investigation was carried out in Parbhani district of Marathwada region of Maharashtra state. Randomly sampling design was adopted in selection of district, tehsils, and villages. Three tehsils *viz.*, Parbhani, Manwat and Pathri were selected randomly from the district. Four villages were randomly selected from the selected taluka. From each selected village, 10 farmers were selected randomly. In this way, a total of 120 farmers were considered as respondents for the present study. These selections were done by using simple random sampling method for the purpose of the study. Ex-post facto research approach was used for the present study. The dependent variable in the study was awareness of IFS while education, farming experience, family size,

occupation, land holding, source of irrigation, annual income, social participation, extension contact, mass media exposure and utilization of income were independent variables. A 3-point rating scale was used to measure the extent of awareness of the farmers. Appropriate weights such as 2 for 'complete aware', 1 for 'partially aware' and 0 for 'never aware' was assigned to each of the scale to measure the level of awareness of the farmers. By adding the assigned weights of each of the responses under 15 specific statements regarding IFS, the awareness of a farmer about IFS was measured. Awareness index was calculated by using following formula;

$$\text{Awareness index} = \frac{\text{Awareness score actually obtained}}{\text{Maximum obtainable awareness score}} \times 100$$

The respondents were categorized according to obtained awareness index score into low, medium and high category on the basis of mean  $\pm$  standard deviation. The data were classified, tabulated and analysed in order to make findings meaningful for interpretation and drawing conclusions.

### Results and Discussion

#### Extent of awareness about IFS among the respondents

The extent of awareness about IFS among the respondents is presented in Table 1. Regarding the extent of awareness about the meaning of IFS among the respondents, higher number of respondents (i.e. 60.83%) had partial awareness about meaning of IFS, followed by 27.50 per cent of them had complete awareness and 11.67 per cent of them did not know the exact meaning of IFS.

**Table 1:** Distribution of the respondents according to their extent of awareness about IFS

(N=120)

Sr. No.	Items of Awareness of IFS	Frequency		
		Complete	Partial	Never
1	Do you know meaning of IFS?	33 (27.50)	73 (60.83)	14 (11.67)
2	IFS combines cropping system with various agro based subsidiary occupations	27 (22.50)	75 (62.50)	18 (15.00)
3	IFS save costs and increase productivity by recycling resources available in one agribusiness to another.	39 (32.50)	60 (50.00)	21 (17.50)
4	Various agro-based occupations in IFS help in increasing the annual income of the farmers.	63 (52.50)	39 (32.50)	18 (15.00)
5	IFS generate financial resources around the year from one or integrated another agri-business.	56 (46.67)	48 (40.00)	16 (13.33)
6	Various agro based occupations in the IFS guarantees income in the uncertainty of agricultural production.	49 (40.83)	54 (45.00)	17 (14.67)
7	IFS can reduce partial unemployment in rural areas	41 (34.16)	57 (47.50)	22 (18.34)
8	IFS can provide balanced nutritious food to farmers' family through various agri-enterprises.	53 (44.16)	54 (45.00)	13 (10.83)
9	IFS can keep cash in the hands of farmers throughout the year	55 (45.83)	44 (36.67)	21 (17.50)
10	The conversion of one cropping system into an IFS results in proper conservation of natural resources	49 (40.83)	51 (42.50)	20 (16.67)
11	Secondary waste generated from diary agri-business, to increase soil fertility	58 (48.33)	44 (36.67)	18 (15.00)
12	IFS improve the living standards of farmers	62 (51.66)	38 (31.67)	20 (16.66)
13	IFS increases crop production and productivity	57 (47.50)	49 (40.83)	14 (11.67)
14	In IFS, balanced use of farm waste is possible, crop residues are wisely used to solve energy problems.	53 (44.17)	43 (35.83)	24 (20.00)
15	IFS leads to sustainable production with proper utilization of available resources without any harm to the environment and land.	62 (51.67)	44 (36.67)	14 (11.66)

In case of awareness about IFS combines various agro-supplementary occupations, 62.50 per cent of the respondents were partially aware about it, followed by 22.50 per cent of them were complete aware and 15.00 per cent of them were completely unaware about it.

Extent of awareness about IFS saves costs and increase productivity by recycling the resources available in one agribusiness to another. Data revealed that 50.00 per cent of the respondents partially aware about it, whereas 32.50 per cent of them were fully aware about it and 17.50 per cent of them were unaware about it.

Regarding to extent of awareness about the statement i.e. various agro-based occupations in the IFS helps in increasing the annual income of the farmers, 52.50 per cent of the respondents were completely aware of this, followed by 32.50 per cent of them were partially aware of it and 15.00 per cent respondents were unaware about it.

In case of awareness of the respondents about IFS generates financial resources around the year from one or integrated another agri- business, 46.67 per cent of them were completely aware about it, while 40.00 per cent of them were partially aware and 3.34 per cent respondents were unaware about it. Regarding the extent of awareness of the respondents about various agro-based occupations in the IFS guaranteed income even in the uncertainty of agricultural production, majority of them (45.00 %) were partially aware about it, followed by 40.83 per cent respondents who were completely aware and 14.66 per cent of them were unaware about it.

Awareness of the respondents about IFS can reduce partial unemployment in rural areas, 47.50 per cent of them were partial aware of it, followed by 34.17 per cent of them were completely aware about it and 18.33 per cent respondents were not aware about it. While awareness about IFS can provide balanced nutritious food for their family members through various agri-enterprises, 45.00 per cent of them were partial aware of it, followed by 44.16 per cent of them were completely aware about it and 10.83 per cent respondents were not aware about it.

Regarding awareness about IFS can keep around the year cash in the hands of farmers, 45.83 per cent respondents were completely aware about this statement and 36.67 percent of them were partial aware about it while 17.50 percent of them were not aware about it. In case of awareness about IFS maintain proper conservation of natural resources, 42.50 per cent of the respondents were partially aware about it and 40.83 per cent of them were completely aware of it while 16.66 per cent respondents were not aware of it.

Concerning the extent of awareness among the respondents about secondary waste generated from dairy agri-business used to increase soil fertility in IFS. About 48.33 per cent of the respondents were completely aware about it, 36.67 per cent of them were partially aware about it and the remaining 15 per cent farmers were not at all aware about it.

Regarding the extent of awareness about the statement that is IFS improves the living standards of farmers, 51.66 per cent of the respondents were completely aware about it while 31.66 per cent of them were partial aware about it and remaining 16.66 per cent respondents were unaware about it. In case of awareness about IFS increase crop production and

productivity, here 47.50 per cent of them were completely aware while 40.83 per cent of them were partial aware of it and the remaining 11.66 per cent respondents were not aware of it at all.

In IFS, balanced use of farm waste is possible, crop residues are wisely used to solve energy problems, 44.16 per cent of the respondents were completely aware about this statement and 35.83 per cent of them farmers were partial while 20 per cent of them were unaware about it. In case of awareness extent about IFS leads to sustainable production with proper utilization of available resources without any harm to the environment, 51.66 per cent of the respondent farmers were completely aware of it and 36.67 per cent of them were partial aware about it while 11.66 per cent of them were not aware about it at all.

### **Awareness of the respondents about various models of IFS**

Regarding awareness of the respondents about various models of IFS (Table 2), 44.17 per cent of the respondents were completely aware about IFS model - Cropping system + Cow / Buffalo Rearing + Vermicompost Production + Fruit Cultivation + Vegetables Cultivation whereas 38.33 per cent of the respondents were unaware about this model while 17.50 per cent of them were partially aware about this model.

In case of awareness of the respondents about IFS model - Crop System + Cow / Buffalo Rearing / Poultry + Fruit Cultivation, 38.33 per cent of the respondents were not aware about this model, whereas 34.17 per cent and 27.50 per cent of them were partially aware and completely aware about this model, respectively.

Table 2 further revealed that 74.17 per cent of the respondents were not aware about IFS model - Cropping System + Goat / Sheep Rearing + Vegetables Cultivation while 15.83 per cent of them were partially aware and only 10 per cent of them were completely aware about this model.

Regarding awareness of IFS model - Crop System + Sericulture + Fish Rearing in Farm Pond, 60.83 per cent of the respondents were unaware about this model, while 31.66 per cent of them were partially aware and only 7.50 per cent of them completely aware about this model. It is also reported that 54.16 per cent of the respondent farmers were not aware about IFS model - Cropping System + Floriculture + Medicinal Plant + Goat / Cow / Buffalo Rearing, while 34.17 per cent of them were partially aware and only 11.67 per cent of them were completely aware about this IFS model.

### **Extent of overall awareness of IFS by the respondents**

Distribution of the respondents according to their extent overall awareness of IFS by farmers has been presented in Table 3. Data shows the extent of overall awareness of IFS by farmers, it revealed that high percentage of the respondents (39.16 %) were medium level of awareness regarding IFS, followed by high level awareness about IFS (36.67%) and 24.16 per cent of them were unaware about IFS concept. Thus, overall result shows that the extent of awareness regarding IFS would be related more by the medium level of awareness. Similar findings have been noted by Younus (2013) and Parmar (2018).

**Table 2:** Distribution of the respondents according to their awareness about various models of

(N=120)

Sr. No.	Items of Awareness of IFS	Frequency		
		Complete	Partial	Never
1	Crop System + Cow / Buffalo Rearing + Vermicompost Production + Fruit Trees + Vegetables	53 (44.17)	21 (17.50)	46 (38.33)
2	Crop System + Cow / Buffalo or Poultry + Fruit Trees	33 (27.50)	41 (34.17)	43 (38.33)
3	Crop System + Goat / Sheep Rearing + Vegetables	12 (10.00)	19 (15.83)	89 (74.17)
4	Crop System + Sericulture + Fish Rearing in Farm Pond	09 (7.50)	38 (31.67)	73 (60.83)
5	Cropping system + Floriculture + Medicinal Plant + Goat / Cow / Buffalo Rearing	14 (11.67)	41 (34.17)	65 (54.16)

\* Figures in parentheses show percentage to their total

**Table 3:** Distributions of the respondents according to extent of overall awareness of IFS by farmers (N=120)

Sr. No.	Categories	Frequency	Percentage
1	Low awareness (Upto 14.64)	29	24.16
2	Medium awareness (14.65 to 30.17)	47	39.17
3	High awareness (30.18 & Above)	44	36.67

### Constraints perceived by the respondents in adoption of IFS

The data depicted in Table 4 shows the various constraints perceived by the respondents related to the IFS. Constraints perceived by the respondents reported into five categories. Regarding production oriented constraints, lack of technical

knowledge about IFS were expressed by 91.67 per cent of the respondents, followed by adverse weather conditions and rainfall uncertainty was expressed by 87.50 per cent respondents. Whereas, constraints of unavailability of quality raw material on time for IFS was expressed by 66.67 per cent of the respondents.

**Table 4:** Constraints faced by the respondents about IFS.

(N=120)

Sr. No.	Constraints	Frequency	Percentage
<b>A) Production oriented constraints</b>			
1	Lack of technical knowledge about IFS	110	91.67
2	Adverse weather conditions and rainfall uncertainty	105	87.50
3	Unavailability of quality raw material on time	80	66.67
<b>B) Situational constraints</b>			
1	Inadequate irrigation facilities	100	83.33
2	limited and irregular power supply	75	62.50
3	Unavailability of labor in seasonal time	70	58.33
4	Lack of agricultural equipment	75	62.50
<b>C) Financial constraints</b>			
1	Lack of quality resources	69	57.50
2	High initial production cost	92	76.67
3	Unavailability of subsidies and loans	105	87.50
<b>D) Market oriented constraints</b>			
1	Lack of market facilities at the village level	102	85.00
2	Price fluctuations	110	91.67
3	Lack of storage facilities for perishable agricultural produce	95	79.17
4	Low prices for agricultural produce	85	70.83
<b>E) Organizational constraints:</b>			
1	Lack of timely guidance from extension agencies	106	88.33
2	Unavailability of medical services available to animals	84	70.00
3	Lack of demonstration to prove the merits of the technology	93	77.50
4	Lack of authentic information in media / radio / newspapers	87	72.50

In case of situational constraints, 83.33 per cent of the respondents expressed the inadequate irrigation facilities was major constraints, whereas equal percentage of the respondents (i.e. 65.50%) were perceived limited and irregular power supply and lack of agricultural equipment. While constraint of unavailability of labour in seasonal time was expressed by 58.33 per cent of the respondents.

In financial constraints, 87.50 per cent of the respondents were expressed the timely non availability of subsidies and loans, whereas 76.67 per cent of them expressed high initial

investment for IFS was the major constraints while lack of quality resources constraints was expressed by 57.50 per cent respondents.

Regarding market-oriented constraints in IFS, 91.67 per cent of the respondents were expressed the constraints of price fluctuations of agricultural produce, followed by 85.00 per cent of the respondents were expressed the constraints of lack of market facilities at the village level. Whereas constraint of lack of storage facilities for perishable agricultural produce was expressed by 79.17 per cent respondents and 70.83 per

cent of them were expressed the constraint of low prices for agriculture produce.

In case of organizational constraint, 88.33 per cent of the respondents were expressed the constraint of lack of timely guidance from extension agencies about IFS, followed by constraint of lack of demonstration to prove the merits of IFS was expressed by 77.50 per cent of the respondents. Whereas lack of information in media or radio or newspapers was constraint expressed by 72.50 per cent of the respondents and 70.00 per cent of them was expressed the constraint of unavailability of medical services to animals.

### Suggestions of the respondents about IFS

Suggestions refer to the ideas put forth by the respondents based on their experience and constraints faced by the respondents. Suggestions of the respondents regarding about IFS are presented in Table 5. It was observed from the Table

5 that majority of the respondents suggested to remove broker / middleman in marketing system of agricultural products (95.83%), followed by government can support to fetch a reasonable price to agriculture produce in the market suggested by 93.33 per cent of the respondents. Agriculture marketing facilities should be strengthened is suggested by 92.50 per cent of the respondents, 91.67 per cent of them suggested make availability of quality inputs at the village level related IFS and regular power supply to agriculture. Equal percentage of the respondents (i.e. 90.00 %) suggested regular organization of demonstrations and training on IFS by extension agencies. Quality breeds of dairy animals should be provided by animal husbandry department and quality inputs should be timely provided by the state department of agriculture were suggested by 81.67 per cent and 79.17 per cent of the respondents respectively.

**Table 5:** Suggestions of the respondents about IFS:

Sr. No.	Suggestions	Frequency	Percentage
1	Remove middleman / brokers in marketing agricultural products	115	95.83
2	Government can support to fetch a reasonable price to agriculture produce in the market.	112	93.33
3	Agriculture marketing facilities should be strengthen	111	92.50
4	Make availability of quality inputs at the village level related IFS.	110	91.67
5	Regular power supply should be provided to agriculture	110	91.67
6	Subsidy should be provided to IFS farmers	108	90.00
7	Regular demonstrations on IFS should be organized by the extension agencies.	108	90.00
8	Training on IFS should be organized by extension agencies	105	87.50
9	Quality breeds of dairy animals should be provided by the Animal Husbandry Department	98	81.67
10	Quality inputs should be timely provided by the state department of agriculture.	95	79.17

(N=120)

### Conclusion

From above findings it is concluded that regarding overall awareness about IFS, majority of them were medium level of aware about IFS. Regarding awareness of the respondents about various models of IFS, 44.16 per cent of the respondents were completely aware about IFS model such as cropping system + cow / buffalo + vermicompost production + Fruit trees + vegetables.

The major constraints faced by the respondents were "Market related constraint" followed by 'production constraints,' 'organization constraints'. Removal of broker from agriculture production market and government support to fetch a reasonable price to agriculture produce were suggested by the majority of the respondents for IFS.

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