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Perception of Beneficiary and Non-Beneficiary Farmers towards Integrated Farming System Demonstration (IFSD)

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ABSTRACT

In the present study an attempt was made to construct a scale to measure the perception of farmers towards integrated farming system (IFS). The scale was found to be reliable and valid. The perception scale developed was administered to 160 farmers of Bangalore Rural and Kolar district of Karnataka state during 2017-18. The results revealed that majority (71.25%) of the beneficiaries had better perception followed by average (16.25%) and poor (12.50 %) level of perception. Whereas, 50.00 per cent of non-beneficiaries had poor perception followed by 36.25 per cent having average perception and 13.75 per cent with better perception. In case of beneficiaries the variables such as land holding, cosmopoliteness, deferred gratification, extension agency contact, extension participation, employment generation and mass media exposure showed positive and highly significant relationship at one per cent level with their perception towards IFS. In case of non beneficiaries, mass media exposure showed positive and highly significant relationship at one per cent level.

Keywords: Perception, integrated farming system, beneficiaries, non-beneficiaries

IN India, agriculture is the main source of national economy and contributes 17.4 per cent of total GDP, while 52 per cent of the nation's workforce depend on agriculture for their livelihood. Majority of the farmers are resource poor with small land holdings. Therefore, the development of the country mainly depends on agricultural development. Increasing population and declining trend in the average size of land holding possess a serious problem to the Indian farmers. It is imperative to develop strategies and agricultural technologies that enable adequate employment and income generation to resource poor farm families.

Various subsidiary enterprises like crop husbandry, dairying, poultry, apiculture, sericulture, etc., have to be combined involving farmers in planning, implementation and evaluation of production plans to register a significant impact. This situation calls for the adoption of Integrated Farming System (IFS).

Integrated farming system is a combination of appropriate enterprises like crop, dairy, poultry, sericulture, bee keeping etc., by the farmers according to the availability of resources to sustain and satisfy the necessities. Suitable scale for measuring the perception of farmers towards IFS is not available. Hence, the study was undertaken with the following objectives :

1. To develop and standardize a scale to measure the perception of farmers towards Integrated Farming System (IFS)
2. To know the perception of beneficiaries and non beneficiaries towards IFS
3. To find out the relationship between personal, socio-economic, psychological characteristics of beneficiaries and non-beneficiaries and their perception towards Integrated Farming System

METHODOLOGY

The present study was carried out during the year 2017-18 in Bangalore Rural and Kolar Districts of Karnataka.

In Karnataka, Krishi Vigyan Kendra's (KVKs) under the administrative control of University of Agricultural Sciences, Bangalore have implemented IFSD project under RKVY project from 2011-12 to 2014-15. Integrated Farming System Demonstration (IFSD) is a unique extension method employed to show how the net income of a farmer would be increased if practiced continuously over a period (2-4 years), properly combining suitable crop and

livestock enterprises along with recycling of farm waste and biomass in addition to prividing guidance in the efficient management of farm. A beneficiary is any farmer who gains an advantage and / or profit from IFSD programme. Non-beneficiary is a farmer who does not receive any advantage and / or profit from IFSD programme.

A sample of 80 beneficiaries and 80 non beneficiaries were selected. From each district, eight villages where selected for the study. From eight villages 10 beneficiary farmers practicing IFSD were selected randomly and 10 non beneficiary farmers were selected from each of the eight surrounding villages for the study. Thus the total sample of 160 respondents from 16 villages of Bangalore Rural and Kolar Districts where selected and personally interviewed using the scale developed to measure the perception of farmers towards IFS. Information regarding 19 personal, socio-economic, psychological and communication characteristics of beneficiary and non beneficiary farmers were collected using a structured schedule with suitable scales. The data collected were scored, tabulated and analysed using frequency, percentage, mean, standard deviation and correlation.

Procedure for Development of Scale to Measure the Perception of farmers towards Integrated Farming System (IFS)

Perception is operationalized in the study as perceived understanding of usefulness and interpretation about various aspects of Integrated Farming System (IFS) practices through their experiences. The method suggested by Likert (1932) and Edwards (1969) in developing summated rating scale was followed in the construction of Perception scale.

Collection of items: The first step in the construction of perception scale was to collect exhaustive statements pertaining to Integrated Farming System. A large number of items were collected from review of literature, informal discussion with agricultural extension personnel and experts from selected areas. Tentative list of 69 statements pertaining to the perception of farmers was prepared.

Editing of the items : The collected statements were edited as per the 14 criteria enunciated by Edwards (1969) and Thurstone and Chave (1929). As a consequence, 13 statements were eliminated and the remaining 56 statements were included for the study.

Relevancy analysis : Fifty six statements were mailed to 120 experts of agricultural extension and other related fields who are working in State Agricultural Universities and ICAR institutions. Experts were asked to critically evaluate the relevancy of each statement as Most Relevant (MR), Relevant (R), Some What Relevant (SWR), Less Relevant (LR) and Not Relevant (NR) with the score of 5, 4, 3, 2 & 1, respectively.

The judges were asked to check each of the statements carefully and also make necessary modifications and additions or deletion of statements. A total of 60 judges returned the questionnaires duly completed in time were considered for further processing. From the data gathered, "Relevancy Percentage" and "Mean Relevancy Score" were worked out for all the 56 statements. Using these criteria, individual statements were screened for relevancies using the following formulas.

$$\text{Relevancy Percentage} = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1) \times 100}{\text{No. of judges responded} \times \text{Maximum possible score}}$$

$$\text{Mean relevancy score} = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{No. of judges responded}}$$

Where,

MR = Most Relevant
R = Relevant
SWR = Some What Relevant,
LR = Less Relevant
NR = Not Relevant

Accordingly statements having 'relevancy percentage' of above 75 per cent and mean relevancy score of above 3.75 were considered for the statements selection. Finally 34 statements were retained after relevancy analysis and were suitably modified as per the comments of the judges where ever applicable.

Item analysis: To eliminate the statements based on the extent to which they can differentiate the statements about perception scale, item analysis was

carried on the statements selected in the first stage. Pilot study was conducted among 30 respondents in non-sample area comprising 34 statements.

For item analysis, statements were arranged in ascending or descending order based on relevancy score. 25 per cent of the subjects with the highest total score and 25 per cent with the lowest total scores were grouped. These two groups provided the criterion group for which item analysis was conducted and critical ratio was calculated using the following formula.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\frac{\sum X^2_H}{n} - (\sum X_H)^2 \times \frac{\sum X^2_L}{n} - (\sum X_L)^2}{n(n-1)}}}$$

Where,

X_H = The mean score on given statement of the high group

X_L = The mean score on given statement of the low group

Σx^2_H = Sum of squares of the individual score on a given statement for high group

Σx^2_L = Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

Σ = Summation

t = The extent to which a given statement differentiate between the high and low group.

After computing the 't' value (2.04) for all the 34 statements, based on the item analysis. 21 statements which were statistical significant at 5 per cent and 1 per cent were finally retained for the scale to measure the perception of farmers towards IFS.

Reliability and Validity of the scale

Reliability : Reliability refers to the precision or accuracy of the measurement or scale. A well made scientific instrument should yield accurate results both at present as well as over time (Ray and Mandal, 2011). Split half method developed by Brown (1910) was employed to measure the reliability of the tools.

1) The half test reliability formula :

$$r_{1/2} = \frac{N(\sum XY - (\sum X)(\sum Y)}{\sqrt{N\sum X^2 - (\sum X)^2)(\sum Y^2 - (\sum Y)^2)}}$$

Where,

ΣX = sum of the scores of the odd number items

ΣY = sum of the scores of the even numbers items

ΣX^2 = sum of the squares of the odd number items

ΣY^2 = sum of the squares of the even number items

2) Whole test reliability formula :

$$r_{11} = \frac{2.\, r_{1/2}}{1+ r_{1/2}}$$

Where,

$r_{1/2}$= half test reliability

Validity : Validity refers to the ability of the instrument to measure what it proposed to measure (Mulay and Sabarthanam, 1980).

3) Validity formula

$V = \sqrt{r_{11}}$

Where,

r_{11} = test reliability

The reliability and validity of the perception scale construction is presented in Table II. Therefore, the scale developed is both reliable and valid.

The elimination of statements at various steps of perception scale construction is presented in Table I. In the first step of collection of items, the number of statements considered were 69 and number of statements retained were 69. In the second step *viz.*, editing of items, number of statements considered were 69 and the number of statements retained were 56 and incase of third step *i.e.*, relevancy analysis, 34 statements were retained out of 56 statements considered. The fourth step in perception scale construction is item analysis. Here the number of statements considered were 34 where as the number of statements retained were 21. In the fifth step of

TABLE I

Elimination of statements at various steps of perception scale construction

Steps in Perception scale Construction	No. of Statements	
	Statements Considered	Statements retained
Collection of items	69	69
Editing of items	69	56
Relevancy Analysis	56	34
Item Analysis	34	21
Reliability and Validity	21	21

finding reliability and validity, the number of statements considered were 21 and the number of statements retained were 21.

Administering the scale : The final scale consists of 21 statements of which 20 are positive statements and one is negative statement. The response is collected on a five point continuum, namely, strongly agree, agree, undecided, disagree and strongly disagree with the assigned score of 5, 4, 3, 2, and 1, respectively and vice versa for negative statements. Thus the minimum and maximum score one could get is 21 and 105, respectively.

RESULTS AND DISCUSSION

Reliability and validity of the Perception scale construction

The reliability co-efficient of half test using Karl Pearson's coefficient ($r_{1/2}$) was found to be 0.7964. The scale reliability co-efficient of the tool was found to be 0.8867 which is higher than the standard of 0.70 indicating reliability of the scale. The scale validity coefficient was found to be 0.9416 which is greater than the standard requirement of 0.70 indicating validity of the scale. Hence scale was found to be reliable and valid (Table II).

TABLE II

Reliability and validity of the perception scale construction

	Particulars	Value
Reliability	Split-half (r 1/2)	0.7964
	Whole-test (r II)	0.8867
Validity	Statistical Validity	0.9416

Statement wise relevancy per cent and mean relevancy scores of the scale to measure the perception of farmers towards Integrated Farming System (IFS)

The statements having 'relevancy percentage' of above 75 per cent and mean relevancy score of above 3.75 were considered for final selection of statements. Accordingly, the 21 statements such as practicing IFS can help to mitigate weeds, pest and disease problems,every piece of land is effectively utilized in IFS, Risk of crop failure is less in IFS compared to conventional farming, the manure and organic waste obtained from IFS farms reduce the fertilizer requirement, IFS creates employment to the farmers throughout the year, IFS increases productivity by way of increase in economic gain per unit area, IFS helps in supply of balanced and nutritious food to the family due to combination of various enterprises, IFS helps in better use of farm by-products from the various enterprises, IFS motivates the farmers to adopt new technologies, Multiple combination of enterprises will give more benefits to the farmer, IFS leads to reduction of soil erosion and improve water infiltration, Farmers would get reputation among their fellow farmers due to adoption of IFS, IFS helps in sustainable soil fertility and productivity by way of organic waste recycling, IFS helps in improving the knowledge and skill of farmers towards farming, IFS provides sustainable family income throughout the year, It is difficult for farmer to market the products from IFS, IFS improves the standard of living of farmers, IFS make the farmers conscious about farm management, Planting trees on bunds will reduce the degradation of forest, IFS will orient the farmers towards less risk than conventional farmers and IFS is a boon to farmers were considered for the perception scale (Table III).

Overall perception level of farmers about Integrated Farming System (IFS)

Table IV summarizes the perceptionof beneficiaries and non-beneficiaries of IFS. It is noticed that, a majority (71.25%) of the beneficiaries had better perception followed by average (16.25%) and

TABLE III

Scale to statements with their relevancy percent and mean relevancy scores to measure the perception of farmers towards Integrated Farming System (IFS)

Statements	Relevancy Percent	Mean relevancy score
Practicing IFS can help to mitigate weeds, pest and disease problems	79.33	3.96
Every piece of land is effectively utilized in IFS	91.33	4.56
Risk of crop failure is less in IFS compared to conventional farming	91.00	4.55
The manure and organic waste obtained from IFS farms reduce the fertilizer requirement	91.66	4.58
IFS creates employment to the farmers throughout the year	90.33	4.51
IFS increases productivity by way of increase in economic gain per unit area	87.66	4.38
IFS helps in supply of balanced and nutritious food to the family due to combination of various enterprises	88.00	4.40
IFS helps in better use of farm by-products from the various enterprises	91.00	4.55
IFS motivates the farmers to adopt new technologies.	87.33	4.36
Multiple combination of enterprises will give more benefits to the farmer	89.66	4.48
IFS leads to reduction of soil erosion and improve water infiltration	87.66	4.38
Farmers would get reputation among their fellow farmers due to adoption of IFS	89.66	4.48
IFS helps in sustainable soil fertility and productivity by way of organic waste recycling	90.33	4.51
IFS helps in improving the knowledge and skill of farmers towards farming	87.00	4.35
IFS provides sustainable family income throughout the year	88.33	4.41
It is difficult for farmer to market the products from IFS	85.66	4.28
IFS improves the standard of living of farmers	87.66	4.38
IFS make the farmers conscious about farm management	84.33	4.21
Planting trees on bunds will reduce the degradation of forest	87.00	4.35
IFS will orient the farmers towards less risk than conventional farmers	87.66	4.38
IFS is a boon to farmers	91.00	4.55

TABLE IV

Overall perception level of farmers about integrated farming system (IFS) (N=160)

Category	Beneficiaries (n=80)		Non-beneficiaries (n= 80)	
	No.	Per cent	No.	Per cent
Poor (<62.93)	10	12.50	40	50.00
Average (62.93 – 79.61)	13	16.25	29	36.25
Better (>79.61)	57	71.25	11	13.75
Total	80	100	80	100

poor (12.50 %) level of perception. Whereas 50.00 per cent of non-beneficiaries had poor perception followed by 36.25 per cent having average perception and 13.75 per cent with better perception.

This might be due to the fact that IFS provides adequate employment, generates additional income and risk of crop failure is comparatively less. Farmers are aware of these through frequent visit of gross-root extension functionaries and regular participation in extension activities. Hence, they responded positively about integrated faming system. The beneficiary farmers were well aware of benefits from the various enterprises of farming systems which ensures food security, income security, social security, create continuous employment, reduce the risk of crop failure and also helps to protect the environment through recycling of plant and animal wastes. Therefore, the farm families can have secured livelihood by practicing farming systems approach. The results are in line with the findings of Rajvendra and Kinjulck (2012), Younus (2013) and Shwetha (2016).

Relationship between personal, socio-economic, psychological and communication characteristics of beneficiaries and their perception towards Integrated Farming System

The results in Table V reveals that the variables age, education, farming experience, family size, income generation, innovative proneness, scientific orientation, achievement motivation, risk orientation, social participation of beneficiary farmers had positive but non- signification relationship with their perception towards integrated farming system. Variables like credit orientation, economic motivation had significant relationship at five per cent level and the variables such as land holding, cosmopoliteness, deferred gratification, extension agency contact, extension participation, employment generation and mass media exposure had positive and highly significant relationship at one per cent level with their perception towards IFS. For every unit of increase in land holding, economic motivation, credit orientation, cosmopoliteness, deferred gratification, extension agency contact, extension participation, employment generation and mass media exposure of the beneficiary farmers there will be an increase in the perception level towards integrated farming system.The findings are in line with the finding of Shwetha (2016) and Kowsalya (2017).

TABLE V

Relationship between personal, socio-economic, psychological and communication characteristics of beneficiaries and their perception towards integrated farming system (N=160)

Independent Variables	Correlation Co-efficient (r)
Age	0.150 NS
Education	0.043 NS
Farming experience	0.110 NS
Land holding	0.248 **
Family size	0.148 NS
Income generation	0.007 NS
Innovative proneness	0.050 NS
Cosmopoliteness	0.408 **
Scientific orientation	0.184 NS
Deferred gratification	0.332 **
Extension Agency contact	0.577 **
Extension participation	0.414 **
Credit orientation	0.230 *
Achievement Motivation	0.032 NS
Risk orientation	0.034 NS
Employment generation	0.396 **
Economic motivation	0.255 *
Social participation	0.173 NS
Mass media exposure	0.387 **

Relationship between personal, socio-economic, psychological and communication characteristics of non-beneficiaries and their perception towards Integrated Farming System

The results in Table VI reveals that the variables *viz.*, extension agency contact, extension participation, credit orientation has a positive and significant relationship at five per cent level, whereas, mass media exposure had positive and highly significant relationship at one per cent level. Remaining variables had posistive but non significant relationship with their perception towards IFS. The reason might be that integrating various enterprises demands more investment on its production. In order to realize, the benefits of the combination of enterprises they might have exposed themselves to different mass media.

TABLE VI

Relationship between personal, socio-economic, psychological and communication characteristics of non-beneficiaries and their perception towards integrated farming system (N=160)

Independent Variables	Correlation Co-efficient (r)
Age	0.008 NS
Education	0.037 NS
Farming experience	0.015 NS
Land holding	0.053 NS
Family size	0.169 NS
Income generation	0.035 NS
Innovative proneness	0.099 NS
Cosmo politeness	0.022 NS
Scientific orientation	0.141 NS
Deferred gratification	0.116 NS
Extension Agency contact	0.256 *
Extension participation	0.230 *
Credit orientation	0.224 *
Achievement Motivation	0.096 NS
Risk orientation	0.064 NS
Employment generation	0.110 NS
Economic motivation	0.039 NS
Social participation	0.037 NS
Mass media exposure	0.320 **

However, for cultivation aspects they looked towards other sources of information like personal contact, exposure visits and group contact methods. These may serve as important sources of information for the farmers to understand the cultivation practices and hence the present trend might have been observed. The results are in line with the studies of Nagadev and Venkataramaiah (2007).

The perception scale developed is found to be reliable and valid. Therefore, it can be used to measure the perception of farmers towards Integrated Farming System (IFS). Larger proportion (71.25%) of the beneficiaries had better perception followed by average (16.25%) and poor (12.50 %) level of perception. Whereas, 50.00 per cent of non-beneficiaries had poor perception followed by 36.25 per cent having average perception and 13.75 per cent with better perception. It can be inferred that farm scientists and extension personnel should popularize the integrated farming system practices among the non-beneficiary farmers since it gives higher yield and income per unit area.

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