

## Original Research Article

# An Index Development Perspective and to Measure the Farmers' Perception of Farmers Towards Market-led Extension and Advisory Services By Producers Organization in India Provided by FPOs

### ABSTRACT

Farmers Producers Organization (FPO) are those collectives of primary producers of agriculture and allied sector. The motto of FPO was to mobilize the small and marginal farmers into producer groups so they could help them in gaining appropriate and real time market intelligence. The intelligence gained is expected to enhance their forward and backward market linkage and guides them to identify and utilize their space in the agricultural values chain. Herewith, the producers can get maximum possible returns for their produce, subsequently, enhancing their farm income, and at the same time, boosts their ability to participate in the commercial markets. The FPOs could achieve this goal through balanced delivery of Market-led Extension and Advisory Services (MLE and AS) which includes activities ranging from delivery of production technologies to finding place in the global market. All these are possible through effective participation of FPO members at all stages and activities of FPO; likewise this leads the FPO to be highly progressive and prosperous growth. For that to happen, it is important to have a measuring instrument to measure the perception of FPO members about towards the Market-led Extension & Advisory and Advisory Services (MLE and AS), provided by the FPO was recognized. In this study, a perception index of the FPO members (PIFM) was developed using the by following the standardized procedures with nine dimensions: viz, availability of its products and services; appropriateness of products and services; adequacy of products and services; quality of products and services; timeliness of products and services; cost of products and services; responsiveness of the staffs in offering the products and services; usefulness of advisory services; and the content of advisory services consisting a total of 33 items. Consequently, the reliability of the PIFM was also verified. The validity of PIFM was validated using face and content validity. Thus, the study and it was found that the PIFM validity was to be 0.846 ( $\alpha$ , Cronbach's Alpha). The validity of PIFM was validated using face and content validity.

**Keywords:** Extension and Advisory Services, FPO, Market Intelligence and Perception Index.

### 1. INTRODUCTION

India is the second most populated country in the world next to China with a population of about 139.34 crores with contribution of 17.7 per cent to the world population. Out of this nearly fifty percent (48.00 per cent) of the work force of the country is involved in agriculture and allied sector either directly or indirectly (Agricultural Census Division, 2020). Beyond all these, India is the second largest food producer in the world next to China in terms of total calorie content. India accounts for 7.39 percent of total global agricultural output. Though in the total value of agricultural production, India drops to fourth place and produces less than half of China's total output. Farm productivity in India is also far lower than in China, the U.S. or Brazil. (FAO, 2022). The major reason behind this scenario is diversified agricultural practices throughout the country and large fragmented land holdings of farmers. There are more than 143 million land holdings in the country with an average size

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of just above 1.08 ha (Agricultural Census Division, 2020). Most ~~of the~~ Indian farmers have land holdings of marginal, small and medium sized. About 83.07 per cent of Indian farmers are ~~of~~ marginal and small farmers.

Though there exists a pluralistic extension system in the country, with this huge farming population, it is very difficult for ~~extension these~~ functionaries to address the individual farmers issues. To overcome these ~~challenges, and help issues and to link~~ these farmers to easily ~~link with to~~ the agricultural value chain; ~~it is important that they are they must be~~ collectivized into producer groups. Since independence, a variety of approaches including cooperatives have been tried for collectivising the farmers, it was felt that there was a need to give more freedom to farmers' organization to operate as business entities in a competitive market (Roy *et al.*, 2022). This led to the formation of producer companies, following the recommendations of the Alagh Committee (1999), which was set up with a mandate to frame a legislation that would accommodate the spirit of a cooperative with the operational flexibility of a private company. Then, the Farmer Producer Companies (FPCs) have emerged as an alternative to state-sponsored or state-led cooperatives since, 2003 with the amendment of the Companies Act (2002). After seeing its success in several states, the centre made policy framework for promotion of FPOs. Then, FPO scheme was formulated in 2013 from a dynamic phase of a nation-wide pilot through the Small Farmers' Agribusiness Consortium (SFAC) under the Ministry of Agriculture funded through the NABARD Bank. Since 2014, NABARD has been managing "Producers' Organization Development and Upliftment Corpus", and promoted many FPOs across the country.

The role of FPO was to help landless, small and marginal farmers tackle the issues related to changing climate, fragmented and small land holdings, non-judicious use/limited water availability, indiscriminate application of inputs, increasing fuel costs, lack of efficient market opportunities etc. and to get access to timely, reliable, and relevant information which can support the complexity of their farming systems. To achieve this the FPOs were providing necessary demand driven, market oriented, diversified, location specific and farm-segmented extension and advisory services to the farming community. With this context as a part of research on FPOs, an effort was made to develop an instrument (a composite index) to measure the perception of FPO members towards Market-led Extension and Advisory Services (MLE&AS) provided by the FPOs. The composite index was developed in such a way covering different possible dimensions for measuring the perception of FPO members.

## 2. METHODOLOGY

The methodology section deals with the systematic procedure followed in achieving the part of the research objective, that is, the development of Perception Index of FPO members (PIFM) towards the Market-led Extension and Advisory Services (MLE&AS) provided by the FPOs.

An index is defined as a technique of totalling or reducing a single composite series of data on several distinct, but related variables expressed in different units of measurement (Elakkiya, 2021).

### 2.1 Construct of the Research

A concept is a term that expresses an abstract idea generalizing from particulars and summarizing related observations. The term "construct" is a concept with additional meaning evolved for scientific purposes, in other words a construct is a combination of concepts (Ray and Mondal, 1999).

Rural advisory services, also called extension, are all the different activities that provide the information and services needed and demanded by farmers and other actors in rural settings to assist them in developing their own technical, organisational, and management skills and practices so as to improve their livelihoods and wellbeing." (Christoplos, 2010).

In the present study "Market led Extension and Advisory Services" is defined as system that facilitate the farmers access to market through the organization of knowledge, information and technologies,

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facilitate interaction with partners in research, education, agri-business and other relevant institutions and assist them to develop their own technical, organizational and management skills and practices as well as to improve the management of their agricultural activities to attain maximum possible returns.

To address the research issue perception of FPO members was taken as the major construct. Perception was defined as a process by which individuals organize and interpret their sensory impressions in order to give meaning to the environment (Robbins, 2012). In the present study, perception is defined as the way in which the Market Led Extension & Advisory Services (EAS) provided by the FPOs is regarded, understood and interpreted by the FPO members with their sensory ability and realize its meaningfulness in the improvement of their agricultural and allied sector income.

## **2.2 Dimensions to Measure the Construct**

In general, FPOs are collectives which is of the farmers, by the farmers and for the farmers. On a broader perspective, the FPOs are involved in rendering Market Led Extension & Advisory Services (EAS) in such a way it should reduce the input cost as well as double the income of the farmers, and make them capable to compete with the global food production system. The meaningfulness of the Market Led Extension & Advisory Services (EAS) provided by the FPOs is interpreted through the availability of its products and services, appropriateness of its products and services, adequacy of its products and services, quality of its products and services, timeliness of its products and services, cost of products and services, responsiveness of the staffs in offering the products and services, Usefulness of advisory services, and Content of advisory services. Hence, several items were framed under these concepts to design the perception index.

## **2.3 Defining the concepts**

**2.3.1 Availability:** Availability refers to the state of product and services that are readily available to the FPO members when they require or express the needs.

**2.3.2 Appropriateness:** Appropriateness refers to the suitability of the product and services given to the FPO members pertaining to situation in demand.

**2.3.3 Adequacy:** Adequacy refers to the completeness of the products and services given by the FPO to its members to fulfil their requirements.

**2.3.4 Quality:** Quality refers to the standards of the products and services provided by the FPO that are being met the expectations of the FPO members.

**2.3.5 Timeliness:** Timeliness refers to the perfection in time for delivering products and services to the FPO members when they express the need.

**2.3.6 Cost:** Cost refers to value for which the products and services offered by the FPOs are bearable by the FPO members

**2.3.7 Responsiveness:** Responsiveness refers to the positive or negative attention of the staffs in the FPOs to the FPO members while performing their activities during the delivery products and services.

**2.3.8 Usefulness:** Usefulness refers to the benefits derived out of the advisory services provided by the FPOs to achieve the goal of higher farm income of the FPO members

**2.3.9 Content:** Content refers to the subject, ideas, innovations, etc, of the advisory services provided by the FPO in a way that satisfies the FPO members to meet their specific farm requirement.

## **2.4 Collection and structuring of index items**

After, identifying different concepts or dimensions relevant to the measuring construct, the next step is the collection and creation of number of items under each concept. The items were collected from various sources viz., research articles, review articles, various national

and international conference proceedings, working papers, reports of NABARD, and also from several web sources. Discussion with field workers of promoting institutes and focus group discussion with farmers were also done for the structuring of items relevant to measure the perception of the FPO members. A total of 128 items were collected and structure initially and after critical evaluation and discussion with the advisory committee only 58 items were retained under nine dimensions stated earlier. These edited items were then sent to 76 extension specialists through post and Google forms into their inboxes working in various institutions like, Indian Council of Agriculture Research (ICAR), State Agriculture Universities, NAARM, CRIDA, IHR, KVKs, MANAGE, IIMR, Experts in various Resource institutes, Agricultural Officers and experts in other national institutions throughout India. for the critical evaluation of statements to determine their relevancy on a three-point continuum viz Most Relevant (MR), Relevant (R) and Irrelevant (IR) with the score of 3, 2 and 1 respectively. The judges were also requested to make necessary modifications or suggestions and addition or deletion of items. The responses received from 42 experts out of 76 experts in time. The relevancy score for each statement was found out by adding the scores based on the rating of all the judges. The relevancy weightage for each dimension and relevancy score of each item was worked out to retain the relevant items using the following formulas.

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#### **2.4.1 Relevancy Weightage**

Relevancy weightage was worked out by the following standard formula

$$\text{Relevancy weightage} = \frac{MR*3+R*2+IR*1}{\text{Maximum possible score}}$$

#### **2.4.2 Mean relevancy score**

Mean relevancy score was worked out by the following standard formula

$$\text{Mean relevancy score} = \frac{MR*3+R*2+IR*1}{\text{Total number of judges responded}}$$

### **3. RESULTS AND DISCUSSION**

#### **3.1 Selection of index items**

Using the relevancy weightage formulae, the relevancy weightage of each dimension was calculated and all the dimensions had the relevancy weightage of more than 0.75. So, all the nine dimensions are found as valid to be included in the composite Index and it was presented in Table.1.

**Table1. Relevancy weightage for selection of dimensions for Perception Index of FPO members (PIFM).**

Sl. No.	Indicators	Relevancy Weightage
1.	Availability of products and services in the FPO	0.83
2.	Appropriateness of products and services offered in the FPO	0.88
3.	Adequacy of products and services offered in the FPO	0.92
4.	Quality of products and services offered in the FPO	0.85
5.	Timeliness of products and services offered in the FPO	0.79
6.	Cost of products and services offered in the FPO	0.88
7.	Responsiveness of the staffs in offering products and services	0.80
8.	Usefulness of advisory services	0.91
9.	Content of advisory services	0.87

Using the mean relevancy score formulae, the mean relevancy score was calculated for verifying the validity of each item for the Perception Index of FPO members (PIFM). The values of mean relevancy score, relevancy weightage and relevancy percentage of each item was given in Table. 2.

**Table 2. Relevancy score, relevancy weightage and relevancy percentage for selection of items for Perception Index of FPO members (PIFM).**

Sl. No.	Dimensions and Items	Mean Relevancy Score
<b>I. Availability of products and services in the FPO</b>		
1	FPO enhances my input and output market access	2.38
2	I can avail all types of production related information from FPO	2.29
3	I can avail all types of market related information from FPO	2.48
4	The inputs / raw materials needed for the members are being sold at the FPO	2.22
5	FPO helps its members in availing crop / commodity / livestock loans	2.32
6	FPO facilitates me for obtaining Unnati Credit Card (KCC)	2.54
7	FPO image (brand) on my product improves its value	2.51
<b>II. Appropriateness of products and services offered in the FPO</b>		
8	The products and services provided by FPO is appropriate for meeting my needs	2.41
9	FPO channelizes information (e.g., about product specifications, market prices) and other business services accessible to its rural producers	2.32
10	I receive regular training on appropriate technologies, organized via. FPO	2.29
11	FPOs help members to overcome production and marketing risks	2.41
12	FPO aids me in management of resources by conducting regular meetings	2.32
13	FPO uses various extension methods (individual, group and mass contact methods) to satisfy its members	2.45
14	Staffs are good in demonstrating newer innovations to its members	2.29
<b>III. Adequacy of products and services offered in the FPO</b>		
15	The services provided by FPO is adequate for planning my production activities	2.25
16	The products available at the FPO are adequate to fulfil my needs	2.38
17	Adequate market-related technical counselling is provided	2.48
18	FPOs aid in proper networking with the producer groups	2.42
19	At grassroot level organizational infrastructures like FPOs is adequate to reach primary producers easily	2.39
20	FPO helps its members in post-harvest handling / post production activities	2.23
<b>IV. Quality of products and services offered in the FPO</b>		
21	The staffs have adequate knowledge to deliver the products and services	2.39
22	FPO offers high quality of services in terms of meeting client information needs and providing information mix and options available to its members	2.39

23	There is no difference between FPOs members and non-members in accessing services	1.96
24	There are enough staffs to attend the queries of members	2.32
25	There is no political involvement in FPOs	2.35
26	All members are treated equally and fairly	2.29
27	I perceive that FPO maintains proper records and documents	2.38
<b>V.</b>	<b>Timeliness of products and services offered in the FPO</b>	
28	I can get all products and services in time from the FPO	2.54
29	Through direct marketing, FPO reduces my time and burden in identifying different marketing channels	2.35
30	Diffusion of market prices is on a regular basis	2.41
31	FPO makes its members aware of recent innovations and technologies in time	2.32
32	FPO meets the members needs in time	2.22
33	I perceive that there is a time lag in the gathering, processing, and delivery of information related to Government schemes	2.29
34	Sustainability depends on the aptness of the members continuous participation in the FPO	2.39
<b>VI.</b>	<b>Cost of products and services offered in the FPO</b>	
35	Individual producer has low bargaining power, enabling traders to impose a low price on their commodity / product	2.35
36	Inputs purchased through FPOs were lower in cost when compared to private sellers	2.45
37	I can get a better price for my commodities when I sell my produce through FPO and there are no brokerage charges	2.22
38	There was no difference in the cost of getting inputs from FPOs between FPO members and non-members	2.52
39	Cost minimization on inputs enables the members to increase the volume of their production	2.45
40	FPO helped to improve the income of its members	2.23
<b>VII.</b>	<b>Responsiveness of the staff in offering products and services in the FPO</b>	
41	Whenever I approached FPO, there was always staff available to provide responses to my queries	2.42
42	The staff employed are well trained and knowledgeable	2.45
43	The staffs in the FPO are good motivators	2.16
44	Critical decisions in FPO are made after conducting group meetings with each Farmer Interest Groups (FIGs)	2.2
45	The attitude of staff towards servicing remains same year to year	2.42
<b>VIII.</b>	<b>Usefulness of advisory services</b>	
46	The advisory services offered in the FPO are very much useful	2.52
47	The advisory services provided helps in addressing management gap in my farm / business activities	2.35
48	Advisory Services provided by FPOs helps in adaptation to new	2.23

	technologies for local conditions	
49	Not just advisory information, but a complete resource package across the agricultural value chain needs to be provided	2.39
50	FPO provides basic, timely and accurately pre-information of different climate and weather conditions for every season	2.32
51	Information provided through the FPO is easy to understand and are applicable for practical use	2.35
<b>IX.</b>	<b>Content of advisory services</b>	
52	Information on promotion of the best agricultural/ animal husbandry/ entrepreneurial practices	2.16
53	Market related advisories helps me in making my marketing decisions	2.55
54	The knowledge exchanged is diverse, from most advanced stage in the development science-based new methods and materials to indigenous robust agricultural technology	2.52
55	Delivery of information is in oral as well as written	2.16
56	Information or advisory available in local language	2.49
57	Information or advisory available in local language	2.16
58	FPO has profound influence on members livelihood development	2.39
	<b>Total Score</b>	<b>136.548</b>
	<b>Mean Relevancy Score</b>	<b>2.354</b>

Accordingly, the items having the relevancy score of more than 2.35 were retained for the final Perception Index of FPO members (PIFM). Since the mean relevancy score of the overall items were calculated as 2.35. The items that were retained for constructing the final index was given in Table. 3.

**Table 3. List of items for Perception Index of FPO members (PIFM).**

Sl. No.	Dimensions & Items
<b>I.</b>	<b>Availability of products and services in the FPO</b>
1.	FPO enhances my input and output market access
2.	I can avail all types of market related information from FPO
3.	FPO facilitates me for obtaining Unnati Credit Card (UCC)
4.	FPO image (brand) on my product improves its value
<b>II.</b>	<b>Appropriateness of products and services offered in the FPO</b>
5.	The products and services provided by FPO is appropriate for meeting my needs
6.	FPOs help members to overcome production and marketing risks
7.	FPO uses various extension methods (individual, group and mass contact methods) to satisfy its members
<b>III.</b>	<b>Adequacy of products and services offered in the FPO</b>
8.	The products available at the FPO are adequate to fulfil my needs
9.	Adequate market-related technical counselling is provided
10.	FPOs aid in proper networking with the producer groups
11.	At grassroot level organizational infrastructures like FPOs is adequate to reach primary producers easily

<b>IV.</b>	<b>Quality of products and services offered in the FPO</b>
12.	The staffs have adequate knowledge to deliver the products and services
13.	There is no political involvement in FPOs
14.	I perceive that FPO maintains proper records and documents
<b>V.</b>	<b>Timeliness of products and services offered in the FPO</b>
15.	I can get all products and services in time from the FPO
16.	Through direct marketing, FPO reduces my time and burden in identifying different marketing channels
17.	Diffusion of market prices is on a regular basis
18.	Sustainability depends on the aptness of the members continuous participation in the FPO
<b>VI.</b>	<b>Cost of products and services offered in the FPO</b>
19.	Individual producer has low bargaining power, enabling traders to impose a low price on their commodity / product
20.	Inputs purchased through FPOs were lower in cost when compared to private sellers
21.	There was no difference in the cost of getting inputs from FPOs between FPO members and non-members
22.	Cost minimization on inputs enables the members to increase the volume of their production
<b>VII.</b>	<b>Responsiveness of the staff in offering products and services in the FPO</b>
23.	Whenever I approached FPO, there was always staff available to provide responses to my queries
24.	The staff employed are well trained and knowledgeable
25.	The attitude of staff towards servicing remains same year to year
<b>VIII.</b>	<b>Usefulness of advisory services</b>
26.	The advisory services offered in the FPO are very much useful
27.	The advisory services provided helps in addressing management gap in my farm / business activities
28.	Not just advisory information, but a complete resource package across the agricultural value chain needs to be provided
29.	Information provided through the FPO is easy to understand and are applicable for practical use
<b>IX.</b>	<b>Content of advisory services</b>
30.	Market related advisories helps me in making my marketing decisions
31.	The knowledge exchanged is diverse, from most advanced stage in the development science-based new methods and materials to indigenous robust agricultural technology
32.	Information or advisory available in local language
33.	FPO has profound influence on members livelihood development

### 3.2 Quantification of dimensions and items for the index

After the selection of the dimensions and the items/statements for the index, to complete the composite perception index there must follow suitable scoring procedure. A separate index was developed for each dimension. For each item in the dimension the respondents were asked to give their responses on a three-point continuum viz., Agree (A), Undecided (UD) and Disagree (DA) with scores of 3, 2 and 1, respectively. For each of the dimension, separate index was calculated using the following formulae.

$$\text{Component index} = \frac{\text{Individual score obtained on the indicator}}{\text{Maximum possible score of that indicator}}$$

For example, Availability index on FPO members perception was computed as below

$$\text{Availability index} = \frac{\text{Item1} + \text{Item2} + \text{Item3} + \text{Item4}}{4 \times 3} \times 100$$

Where, the availability indicator has four items and the maximum possible score of each item is three. Similar procedure was followed for all the remaining nine dimensions to get the individual index scores.

The composite perception index on FPO members (PIFM) was obtained using the following formula

$$\text{PIFM} = \frac{(\text{AVA} \times 4) + (\text{APP} \times 3) + (\text{ADQ} \times 4) + (\text{QUA} \times 3) + (\text{TIM} \times 4) + (\text{COS} \times 4) + (\text{ROS} \times 3) + (\text{USE} \times 4) + (\text{CON} \times 4)}{\text{Total number of items in each indicator of the perception index of FPO members}}$$

Here the total number of items in each indicator of the Perception Index of FPO members (PIFM) is the weightage of items in the index and its value is 33.

### 3.3 Standardization of the tool

#### 3.3.1 Reliability

It is more important to test the reliability of the instrument for sound measurement. If the quality of reliability is satisfied by an instrument, then while using it we can be confident that the transient and situational factors are not interfering (Kothari and Garg, 2014).

In the present study the reliability of the index was determined using 'Cronbach's alpha'. Cronbach's alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items. It is computed by correlating the score for each scale item with the total score for each observation, and then comparing that to the variance for all individual item scores. The formula for Cronbach's alpha is

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Where,  $N$  = the number of items.

$\bar{c}$  = average covariance between item-pairs.

$\bar{v}$  = average variance.

Table 4. Reliability Statistical result

Index	Reliability Statistics		
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
PIFM	0.839	0.846	33

In the present study, the structured items are employed to 30 respondents in the non-sample area. The resulting  $\alpha$  coefficient of reliability for the Perception Index of FPO Members (PIFM) is 0.846, which made evident that the internal consistency of PIFM is 'Better'. Hence, it is clear from the above

results that the constructed index is reliable as the value of reliability coefficient ( $\alpha$  coefficient) is greater than 0.6.

### 3.3.2 Validity

Validity of a research instrument assesses the extent to which the instrument measures what it is designed or intended to measure (Robson, 2011). The face and content validity were chosen to validate the tool. The face validity of the tool is established through the statement of each item and it was clearly self-evident. The content validity of the tool is established through the experts' judgement. From the calculations done for carrying out the relevancy test, the content validity of the tool is established. So, the instrument was said to be valid for measuring the Perception of FPO members towards the products and services provided by the FPOs.

## 4. CONCLUSION

Presently and in near future the extension system in India would be highly oriented towards the farmers' collectives. From 2014, since the Government has been boosting farmers' collectives through lot of initiatives and funding mechanisms including the FPO movement in 2014, the Government was boosting the farmers' collectives through lot of initiatives and funding mechanism. One such initiative is the "Formation and Promotion of 10,000 new Farmer Producer Organizations (FPOs)" for Rs. 6865 crores in 2020. For effective delivery of Market-led Extension and Advisory Services (MLE&AS) these infrastructural arrangement will act as the grass-root functionaries to reach the farming community. With this view, the composite PIFM was designed in such a way that it can be used for measuring perception of FPO members towards the products and services provided by the FPOs with different producer groups viz, Agricultural producers, horticultural producers, Spice growers, Milk Producers, Sheep and Goat producers, etc. Further, the tool developed will be also helpful for the researchers, academicians, and policy makers in monitoring and evaluation of the FPO activities and for future planning for its improvement.

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#### **ABBREVIATIONS**

FAO - Food and Agricultural Organization, PIFM - Perception Index of FPO Members, NABARD - National Bank for Agriculture and Rural Development, NAARM - National Academy of Agricultural Research Management, CRIDA - Central Research Institute for Dryland Agriculture, IIHR - Indian Institute of Horticultural Research, MANAGE - National Institute of Agricultural Extension Management & IIMR - Indian Institute of Millets Research