

International Journal of Agriculture Extension and Social Development

Volume 7; Issue 4; April 2024; Page No. 435-440

Received: 06-01-2024
Accepted: 14-02-2024

Indexed Journal
Peer Reviewed Journal

Construction of a scale for measuring consequences of farmer producer company on its beneficiaries

¹Lade AH, ²Ahire RD and ³Kausadikar KD

^{1,3}Ph.D. Scholar, Department of Agricultural Extension Education, COA, VNMKV, Parbhani, Maharashtra, India

² Associate Dean and Principal, COA, Badnapur, Maharashtra, India

DOI: <https://doi.org/10.33545/26180723.2024.v7.i4f.559>

Corresponding Author: Lade AH

Abstract

The present study aimed to develop and standardize a scale to measure the consequences of Farmer Producer Company on its beneficiaries in the Marathwada region. The summated rating method, developed by Likert (1932) and Edwards (1969), was employed for this purpose. Out of 54 statements, 48 were selected based on their t-values, with greater than 1.75 and highest 't' value were finally selected for inclusion in the scale. The reliability of the scale was assessed using the reliability coefficient (Cronbach's alpha), which was found to be 0.83. The validity of the scale was evaluated through expert judgments. The reliability and validity results indicate the consistency and precision of the scale's outcomes. The final set of 48 statements was administered on a five-point continuum, where scores for positive statements ranged from 'Strongly Agree' to 'Strongly Disagree' (5 to 1), and for negative statements, the scoring was reversed.

Keywords: Scale development, farmer producer company, reliability assessment, validity evaluation, summated rating method

Introduction

Agriculture, serving as the backbone of the Indian economy, plays a pivotal role in ensuring livelihood security, especially in rural areas where farm-related sources dominate. Livelihoods in these regions encompass a mix of on-farm and off-farm activities, providing diverse strategies for acquiring both food and cash (Frankenberger, 1998) ^[3]. This crucial sector contributes a substantial 18.3 per cent to the GDP and offers employment to 58.3 per cent of the country's population (PIB, 2023). In the present context of rapid changes, the agriculture sector in India faces severe challenges such as declining per capita agricultural land availability (due to increased fragmentation of land holdings), a decline in the natural resources base, increased demand for land for non-agricultural purposes due to urbanization and industrialization, and the disinterest of the youth towards agriculture. More than 40.00 per cent of rural youth wish to quit farming. In Indian farming, the majority of farmers are small and marginal. Specifically, 86 per cent of farmers fall into the categories of small farmers (with land between 1.01 ha and 2.00 ha) or marginal farmers (with less than 1.00 ha of land). On average, each of these farmers takes care of about 1.16 ha of land. This smallholding pattern is more noticeable now than ever before in Indian agriculture.

Farmers' Producer Company is a powerful tool for small farmers to enhance their participation in the market, leading to improved agricultural production, productivity, and profitability. This collaborative approach addresses key challenges in agriculture by providing small farmers with better access to investments, technology, inputs, and

markets. The primary goal of FPO is to ensure that individual farmers can achieve better income by organizing themselves, particularly crucial for those with limited resources to benefit from economies of scale. In the agricultural marketing landscape, FPC mitigates issues arising from a complex chain of non-transparent middlemen, enabling primary producers to receive a more significant share of the value that consumers pay. Through this collective effort, farmers gain the advantages of economies of scale, enhancing their bargaining power with bulk buyers and suppliers. Recognizing that the success of small-scale, resource-poor farmers is closely tied to increased productivity, specialization, and higher income, FPC emerges as a vital catalyst for positive transformation in the agricultural sector (Jose *et al*, 2023) ^[4].

Specific objective of the study

To develop scale to measure consequences of farmer producer company on its beneficiaries

Methodology

An attempt has been made in the present investigation to develop a scale to measure consequences of farmer producer company on its beneficiaries. It refers to consequences are changes that occurrence to an individual or social system as a result of the adoption or rejection of an innovation. The method of Summated Rating suggested by Likert (1932) ^[5] and Edwards (1969) ^[2] were followed in the construction of scale. This method was followed through six stages *viz.*, identification of dimensions, collection and edition of items, relevancy test, item analysis, selection of statements and

administration of final scale, reliability and validity.

Identification of Dimensions

Farmer Producer Company is the dimension related to consequences of farmer Producer Company on its beneficiaries in this investigation which is identified based on review of literature and discussion with research guide, expert in the field of extension education.

Collection and edition of items

Ninety five (95) statements expressing the consequences of farmer producer company on its beneficiaries have been collected from available literature, websites and in consultation with research guide, expert in the field of extension education and they were edited on the basis of 14 criterion suggested by Thurstone (1946) [7], Likert (1932) [5] and Edward (1957) [2]. Out of one hundred thirteen (113) statements, ninety five (95) statements were retained after editing. These statements were found to be non- ambiguous and non-factual.

Relevancy of the statements

The selected 95 statements were sent to 160 judges, including assistant professors, associate professors, scientists, and extension personnel from State Agricultural Universities, Deemed Universities, and National Institutes such as MANAGE and ICAR institutes. They were provided with appropriate instructions to critically judge the items for their relevancy in measuring the consequences of a farmer producer company on its beneficiaries. Each judge was asked to carefully assess the relevance of each statement using a three-point continuum: Most Relevant (MR), Relevant (R), and Not Relevant (NR), with corresponding scores of 3, 2, and 1 respectively. Additionally, their opinion about the inclusion of the statements in the final scale was solicited. A total of 100 judges responded to the appeal and returned the duly filled schedules. Based on the responses received, the relevancy weightage, relevancy percentage, and mean relevancy score for each statement were calculated using the appropriate formulas, and the computed values are presented in Table 1.

Table 1: Judges contacted and responses received

Sr. No.	Particulars	Number of judges contacted	Number of appropriate responses received
1	Dean, Head of Extension Education discipline	22	13 (13.00)
2	Professor/equivalent	28	16 (16.00)
3	Associate Professor/equivalent	40	20 (20.00)
4	Assistant Professor/equivalent	70	51 (51.00)
	Total number of judges =	160	100 (100.00)

(* Figures in the parentheses indicate percentages)

Selection of Items

The responses of the judges were tabulated, and the data were analyzed to calculate the Relevancy Weightage (RW), Relevancy Percentage (RP), and Mean Relevancy Score (MRS) for all the statements as follows.

• **Relevancy Weightage**

It was obtained by the standard formula which is given below.

$$RW = \frac{MRR \times 3 + RR \times 2 + NRR \times 1}{MOS (3 \times 100 = 300)}$$

Where,

- RW = Relevancy Weightage
- MRR = Most Relevant Response
- RR = Relevant Response
- NRR = Not Relevant Response
- MOS = Maximum Obtainable Score

• **Relevancy Percentage**

It was obtained by the standard formula which is given below.

$$RP = \frac{OS}{MOS (3 \times 100 = 300)} \times 100$$

Where,

- RP = Relevancy Percentage
- OS = Obtained Score
- MOS = Maximum Obtainable Score

• **Mean Relevancy Score**

The mean relevancy score was obtained by the following standard formula.

$$MRS = \frac{MRR \times 3 + RR \times 2 + NRR \times 1}{\text{No. of judges (100)}}$$

Where,

- MRS = Mean Relevancy Score
- MRR = Most Relevant Response
- RR = Relevant Response
- NRR = Not Relevant Response

Using these three criteria, the items were screened for their relevancy. Taking into consideration the overall values, items with a relevancy weightage of more than 0.66, a relevancy percentage of more than 66.00 percent, and a mean relevancy score of more than 2.00 were considered for inclusion in the item analysis. Consequently, 54 statements were retained out of the initial 95 statements.

Calculation of ‘t’ value (Item Analysis)

The critical ratio, which is the ‘t’ value measuring the extent to which a given statement differentiates between the high and low groups of respondents for each statement, was calculated using the formula suggested by Edward (1957) [2].

These 54 statements underwent item analysis to determine their relevance in analyzing the consequences of a farmer producer company on its beneficiaries in Maharashtra state. For this, 40 beneficiaries of the FPC were selected from a non-sampling survey area. Warneshwar Agro Producer Company Limited, located at At. Warna Tq. Jintur Dist.

Parbhani, was chosen for the non-sampling survey. From this FPC, four villages were selected based on the maximum number of beneficiaries. Ten beneficiaries were then selected from each of these villages, resulting in a total of 40 respondent beneficiaries for the non-sampling survey.

The respondents were asked to provide their responses to each statement on a five-point continuum ranging from 'Strongly agree' to 'Strongly disagree'. The scoring pattern adopted was 5 for a 'Strongly agree' response, 4 for 'Agree', 3 for 'Undecided', 2 for 'Disagree', and 1 for 'Strongly disagree' responses for positive statements. For negative statements, the scoring pattern was reversed. Based on the total scores, the respondents were arranged in descending order. The top 25.00 percent of respondents with their total scores were considered as the high group, while the bottom 25.00 percent were considered as the low group. These two groups were utilized as criterion groups to evaluate individual statements, as suggested by Edwards (1957). Thus, out of the 40 beneficiaries of the FPC to whom the items were administered for item analysis, 10 beneficiaries with the lowest scores and 10 with the highest scores were used as criterion groups for evaluating individual items. The critical ratio, denoted as the 't' value, serves as a measure of the extent to which a given statement

distinguishes between the high and low groups of respondents for each statement. This ratio was calculated using the formula proposed by Edward (1957) [2].

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

Where,

$$(X_H - \bar{X}_H)^2 = X_H^2 - (X_H)$$

$$(X_L - \bar{X}_L)^2 = X_L^2 - (X_L)$$

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

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

X_H² = Sum of squares of the individual score on a given statement for high group

X_L² = Sum of squares of the individual score on a given statement for low group

X_H = Summation of scores on given statement for high group

X_L = Summation of scores on given statement for low group

n = Number of respondents in each group

∑ = Summation

Table 2: The calculation of 't' value for measuring the extent to which a given statement differentiates between the high and low groups of the respondents

Statement	Response Category	Low group				High group			
		X	f	fX	fX ²	X	f	fX	fX ²
FPC helps to provide grain storage facilities that reduce grain losses for farmers	Strongly Agree	5	0	0	0	5	2	10	50
	Agree	4	0	0	0	4	3	12	48
	Undecided	3	0	0	0	3	1	3	9
	Disagree	2	5	10	20	2	4	8	16
	Strongly Disagree	1	5	5	5	1	0	0	0
		∑	10	15	25	∑	10	33	123
			nL	∑XL	∑XL ²		nH	∑XH	∑XH ²

Where, X = Score assigned to the response category; f = Frequency

$$\bar{X}_L = \frac{\sum XL}{nL} = \frac{15}{10} = 1.5 \quad \bar{X}_H = \frac{\sum XH}{nH} = \frac{33}{10} = 3.3$$

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

$$\sum(X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n} = 25 - \frac{(15)^2}{10} = 2.5$$

$$\sum(X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n} = 123 - \frac{(33)^2}{10} = 14.1$$

$$= \frac{3.3 - 1.5}{\sqrt{\frac{14.1 + 2.5}{10(10 - 1)}}} = \frac{1.8}{0.429} = 4.19$$

Table 3: A list of 54 statements with their respective 't' values.

s	Statements	't' Value
A)	Risk Management	
1	FPC helps to provide grain storage facilities that reduce grain losses for farmers.	4.19
2	FPC members use Minikit trials/Adaptive trials for new crops, which helps reduce the uncertainty/failure of crops.	2.997
3	FPC never provides a platform for crop insurance, vehicle insurance, and life insurance to its members.	1.931
4	FPC helps increase the stability of business operations and also decreases legal liability	1.712
5	FPC uses modern technology that reduces crop damage, such as weather forecasting.	1.689
B)	Cooperation	
1	FPC helps in planning group activities	3.138
2	FPC helps in accessing input supplies	2.796
3	FPC helps in marketing the produce	2.428
4	FPC helps in accessing agricultural information through ICTs	2.398
5	FPC helps in accessing bank loan services	1.646
C)	Coordination	
1	FPCs coordinate beneficiaries in integrating various farm activities	2.871
2	Members' efforts bring change in organization or organizational management due to better coordination	2.463
3	FPC helps in avoiding conflicts between beneficiaries and the organization	1.945
4	Arrangement of group efforts to provide unity of action in the pursuit of a common objective	1.695
D)	Time management	
1	FPC helps make members aware of the timely application of inputs for good productivity.	3.244
2	FPC organizes timely results/method demonstrations	3.036
3	FPC provides timely advisory services to beneficiaries	2.997
4	FPC helps in timely harvesting, threshing, storage, grading, processing, packaging, and marketing of farm produce	2.934
5	FPC is not financially strong enough to provide timely crop loan services to beneficiaries for crop production	1.843
E)	Operational effectiveness	
1	FPC develops beneficiaries' skills through training programs, workshops, and study tours to increase efficiency in productivity	3.215
2	FPC maintains stability in the market between buyers and sellers	3.125
3	FPC receives complaints from their beneficiaries and solves them before they escalate	2.929
4	FPC, by reducing the cost of production, increases the profit of members' farm produce	2.847
5	Provides service centers for dealing with farm problems and agricultural information	2.839
6	FPC increases the value of farm produce through value addition processes to generate good market and profit	2.391
7	FPC gives incentives and rewards to their beneficiaries for effective performance/contribution to the organization.	1.695
F)	Saving pattern	
1	FPC shares equal profits among shareholder beneficiaries.	3.124
2	FPC works on gaining profit to improve the livelihood and welfare of its beneficiaries	2.889
3	FPC gives opportunities to use allocated resources for saving time and expenses.	2.743
4	FPC provides timely disbursements of payments to the beneficiaries	2.700
5	FPC helps to reduce indebtedness among the members	2.309
6	There is no exploitation of the beneficiaries while working in an organization	2.242
7	FPC is excellent for a profitable approach among small and marginal beneficiaries	2.146
8	FPC increases the share of the family budget on recreational items	1.867
G)	Market behaviour	
1	FPC enhances the development of the marketing network	3.050
2	Start publicity of their farm produce, value-added products, and agricultural inputs.	3.013
3	FPC helps in storage, grading, processing, packaging, and marketing of farm produce under the company brand name	2.802
4	FPC provides well-equipped transport facilities	2.367
5	FPC does not use blockchain technology to identify the purity/quality of farm commodities and value-added products	2.107
6	FPC gives concessions while launching new products in the market	1.647
H)	Psychological change	
1	FPC helps improve the adoption rate of new agricultural technology, such as adopting improved crop varieties and better cultivation practices	3.052
2	FPC enhances the risk-taking ability of beneficiaries regarding the adoption of new technology	2.878
3	FPC helps to improve decision making capacity of the beneficiaries about precision agricultural operation	2.556
4	Accepting venture for making more popular and demanding products, such as empire builder	2.545
5	FPC promotes increasing self-confidence, courage, and self-esteem	2.394
6	FPC helps to change the attitude of people towards the organization	2.125
7	FPC establishes leadership qualities among the members	2.024
I)	Socio economic Status	
1	Beneficiaries can purchase modern implements and tools to maximize farm income	2.996
2	FPC helps the beneficiaries to access various research stations and agricultural universities to obtain technical know-how for maximum production	2.925
3	FPC helps reduce the migration of rural people to urban areas	2.681
4	FPC helps fulfill the basic needs of the family	2.475

5	FPC enhances the positive self-image of beneficiaries towards employment generation	2.101
6	FPC develops self-reliance and awareness among the beneficiaries	2.047
7	FPC helps improve the personal and socio-economic status of the members	1.847

After computing the 't' value for all 54 items, statements with a value greater than 1.75 and the highest 't' value were finally selected, resulting in 48 statements for inclusion in the scale. The list of statements and their corresponding 't' values are presented in Table 3.

Reliability

Reliability refers to the precision or accuracy of a measurement or score. A well-made scientific instrument should yield accurate results both at present and over time.

• **Test-retest method**

The final set of 48 statements, representing the consequences of a farmer producer company on its beneficiaries in the Marathwada region of Maharashtra state, was administered on a five-point continuum to a fresh group of 40 beneficiaries who were not included in the original sample. Surya Farmer Producer Company Limited, located at At. Satephal Tq. Basmat Dist. Hingoli, was selected for the test-retest method. From this FPC, four villages were chosen based on the maximum number of beneficiaries. Ten beneficiaries were then selected from each of these villages, resulting in a total of 40 beneficiaries for the test-retest method. After a period of 15 days, the scale was administered again to the same respondents, thus yielding two sets of scores.

The 'r' value (0.83) was found to be significant at the 0.01 level of probability, indicating that the consequences of a farmer producer company on its beneficiaries scale was

suitable for administration to extension personnel. This suggests that the scale was stable and dependable in its measurement.

Validity of the scale

The validity of a test refers to the accuracy with which it measures what it is intended to measure. In the case of the present scale, its validity was assessed through a content validity test.

Content validity

The content validity of the scale was established in two ways. Firstly, the selection of various main and sub-items for inclusion in the scale was based on an extensive literature review from various studies. Secondly, the opinions of a panel of 100 judges, who were experts in the field of extension education, were obtained to determine whether the suggested items were relevant for inclusion in the scale.

Results and Discussion

The final scale comprises 48 statements. Responses were recorded on a five-point continuum representing "Strongly agree," "Agree," "Undecided," "Disagree," and "Strongly disagree," with scores of 5, 4, 3, 2, and 1 respectively for positive statements, and vice versa for negative statements. The score for each respondent can be calculated by summing the scores obtained by them on all the items.

Table 4: A List of 48 statements for scale construction to measure the consequences of Farmer Producer Company on its beneficiaries

Sr. No.	Statements	SA (5)	A (4)	U (3)	D (2)	SDA (1)
A) Risk Management						
1	FPC helps to provide grain storage facilities that reduce grain losses for farmers					
2	FPC members use Minikit trials/Adaptive trials for new crops, which helps reduce the uncertainty/failure of crops					
3	FPC never provides a platform for crop insurance, vehicle insurance, and life insurance to its members					
B) Cooperation						
1	FPC helps in planning group activities					
2	FPC helps in accessing input supplies					
3	FPC helps in marketing the produce					
4	FPC helps in accessing agricultural information through ICTs					
C) Coordination						
1	FPCs coordinate beneficiaries in integrating various farm activities					
2	Members' efforts bring change in organization or organizational management due to better coordination					
3	FPC helps in avoiding conflicts between beneficiaries and the organization					
D) Time management						
1	FPC helps make members aware of the timely application of inputs for good productivity.					
2	FPC organizes timely results/method demonstrations					
3	FPC provides timely advisory services to beneficiaries					
4	FPC helps in timely harvesting, threshing, storage, grading, processing, packaging, and marketing of farm produce					
5	FPC is not financially strong enough to provide timely crop loan services to beneficiaries for crop production					
E) Operational effectiveness						
1	FPC develops beneficiaries' skills through training programs, workshops, and study tours to increase efficiency in productivity					
2	FPC maintains stability in the market between buyers and sellers					
3	FPC receives complaints from their beneficiaries and solves them before they escalate					
4	FPC, by reducing the cost of production, increases the profit of members' farm produce					
5	Provides service centers for dealing with farm problems and agricultural information					
6	FPC increases the value of farm produce through value addition processes to generate good market and profit					

F)	Saving pattern				
1	FPC shares equal profits among shareholder beneficiaries				
2	FPC works on gaining profit to improve the livelihood and welfare of its beneficiaries				
3	FPC gives opportunities to use allocated resources for saving time and expenses				
4	FPC provides timely disbursements of payments to the beneficiaries				
5	FPC helps to reduce indebtedness among the members				
6	There is no exploitation of the beneficiaries while working in an organization				
7	FPC is excellent for a profitable approach among small and marginal beneficiaries				
8	FPC increases the share of the family budget on recreational items				
G	Market behaviour				
1	FPC enhances the development of the marketing network				
2	Start publicity of their farm produce, value-added products, and agricultural inputs.				
3	FPC helps in storage, grading, processing, packaging, and marketing of farm produce under the company brand name				
4	FPC provides well-equipped transport facilities				
5	FPC does not use blockchain technology to identify the purity/quality of farm commodities and value-added products				
H	Psychological change				
1	FPC helps improve the adoption rate of new agricultural technology, such as adopting improved crop varieties and better cultivation practices				
2	FPC enhances the risk-taking ability of beneficiaries regarding the adoption of new technology				
3	FPC helps to improve decision making capacity of the beneficiaries about precision agricultural operation				
4	Accepting venture for making more popular and demanding products, such as empire builder				
5	FPC promotes increasing self-confidence, courage, and self-esteem				
6	FPC helps to change the attitude of people towards the organization				
7	FPC establishes leadership qualities among the members				
I)	Socio economic Status				
1	Beneficiaries can purchase modern implements and tools to maximize farm income				
2	FPC helps the beneficiaries to access various research stations and agricultural universities to obtain technical know-how for maximum production				
3	FPC helps reduce the migration of rural people to urban areas				
4	FPC helps fulfill the basic needs of the family				
5	FPC enhances the positive self-image of beneficiaries towards employment generation				
6	FPC develops self-reliance and awareness among the beneficiaries				
7	FPC helps improve the personal and socio-economic status of the members				

Conclusion

The study has successfully developed a practical tool a standardized scale with 48 statements to gauge the impact of farmer producer companies on their beneficiaries. This scale is crucial for policymakers, providing them with valuable insights to make informed decisions. Through rigorous testing, we have identified key items that are reliable, valid, and statistically significant, strengthening the scale's effectiveness. Importantly, the scale can differentiate between different types of farmers, showcasing its ability to measure behavioral aspects accurately. Overall, this development represents a significant stride in understanding the role of farmer producer companies in agriculture, offering a comprehensive framework for decision-makers, researchers, and practitioners to improve agricultural initiatives' effectiveness and sustainability.

References

1. Edwards AL. Techniques of attitude scale construction. Bombay (Mumbai): Vakils, Feffer and Simons Private Ltd; c1957.
2. Edwards AL. Techniques of attitude scale construction. Bombay: Vakils, Feffer and Simons Pvt Ltd; c1969.
3. Frankenberger TR, McCaston MK. The household livelihood security concept. Food Nutr Agric. 1998;12(3):30-35.
4. Jose AE, Jayalekshmi G, Lade AH, Karde R. Socio-psychological constructs and perceived economic

variables on entrepreneurial behavior among Farmer Producer Organization members in Kerala: A comprehensive analysis. Asian J Agric Ext Econ Soc. 2023;41(9):241-250.

5. Likert R. A technique for the measurement of attitudes. New York: The Science Press; c1932.
6. Press Information Bureau, Government of India. Livelihood of farmers. New Delhi, India: Ministry of Agriculture and Farmers Welfare; c2023 [cited 2023]. Available from: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1906888>
7. Thurstone LL. The measurement of attitude. American J Sociol. Chicago: University Press; c1946. p. 39-50.