

International Journal of Agriculture Extension and Social Development

Volume 9; Issue 2; February 2026; Page No. 217-222

Received: 10-11-2025
Accepted: 25-01-2026

Indexed Journal
Peer Reviewed Journal

Development and standardization of scale for measurement of attitude of farm women towards agriculture as an enterprise

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i2c.3042>

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Abstract

Farm women constitute a vital segment of the rural workforce and play a decisive role in agricultural development. Recognizing agriculture as an enterprise requires a favourable attitude supported by risk-taking ability, innovation, managerial skills, and economic orientation. The present study was undertaken to develop and standardize a reliable and valid scale to measure the attitude of farm women towards agriculture as an enterprise. The study was conducted during 2022 in Akola and Washim districts of Maharashtra, with a total sample of 240 respondents.

Following a systematic scale construction procedure, statements were generated, screened, and subjected to relevancy testing and item analysis. Initially, 98 statements were formulated based on literature review and expert consultation, of which 79 were retained after editing. Relevancy testing by 91 subject-matter experts resulted in the selection of 46 statements. Item analysis using the critical ratio ('t' value) led to the final selection of 35 statements, comprising 28 positive and 7 negative statements, covering seven dimensions: risk aversion/taking, innovational attitude, social attitude, managerial attitude, economical attitude, stressfulness, and satisfaction.

The reliability of the scale was established using the test-retest method, yielding a high reliability coefficient ($r = 0.823$), significant at the 0.01 level. Content validity was ensured through comprehensive coverage of the construct and expert judgment. The developed scale is a standardized, dependable instrument that can be effectively used in future research and extension programmes to assess and compare the attitude of farm women towards agriculture as an enterprise.

Keywords: Attitude scale, farm women, agriculture as an enterprise, rural women, women empowerment, agricultural entrepreneurship

1. Introduction

India is predominantly an agrarian economy, with agriculture and allied sectors providing livelihood to a significant proportion of the population. According to Census 2011, about 54.60% of the total workforce is engaged in agriculture and allied activities. Women constitute a substantial share of this workforce and play a crucial role in sustaining agricultural production systems. The workforce participation rate of rural women is considerably higher (41.8%) compared to urban women (35.31%) (MoSPI, 2017), indicating their vital contribution to rural economic development.

In rural India, agriculture and allied activities serve as the primary source of livelihood for nearly 80% of economically active women. Among them, approximately 33% are agricultural labourers, while 48% are self-employed farmers. Rural women actively participate across the entire agricultural value chain, including pre-harvest

operations, post-harvest processing, storage, packaging, and marketing, thereby enhancing farm productivity and household income. Over time, the increasing ratio of women to men in agriculture reflects their growing contribution to agricultural growth and national GDP (Pingali *et al.*, 2019) [9].

Women engaged in farming activities are commonly referred to as farm women, defined as women belonging to farm families whose primary source of income is agriculture. Farm women shoulder multiple responsibilities simultaneously, encompassing household management, farm operations, and livestock care. Despite their extensive involvement, their role often remains under-recognized, particularly in terms of decision-making, ownership, and entrepreneurial engagement in agriculture.

In Maharashtra, women account for 48.17% of the total population, of which 55.45% reside in rural areas. Notably, about 74.93% of rural women are engaged in agriculture

and allied activities (Census, 2011) ^[4]. With the increasing emphasis on agriculture as an enterprise rather than a subsistence activity, understanding the attitude of farm women towards agriculture as an enterprise becomes crucial. Attitude significantly influences adoption of innovations, risk-taking behaviour, managerial efficiency, and entrepreneurial orientation.

However, the availability of a standardized and reliable instrument to measure the attitude of farm women towards agriculture as an enterprise is limited. Hence, the present study was undertaken with the objective of developing and standardizing a scale to measure the attitude of farm women towards agriculture as an enterprise, which can serve as a valuable tool for researchers, extension professionals, and policy planners.

2. Materials and Methods

An attitude is a theoretical concept used to describe how much a person likes or dislikes something. It reflects the level of positive or negative feelings a person holds toward a particular psychological object, such as a person, idea, event, or situation.

Allport (1967) ^[1] defined attitude as “a mental and neural state of readiness, organized through experience, exerting directive or dynamic influence upon an individual's response to all objects and situations with which it is related”.

The attitude was defined as the “sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic” (Thurstone, 1967) ^[11].

Breckler and Wiggings (1992) ^[3] defined attitude as mental and neural representations, organized through experience, exerting a directive or dynamic influence on behaviour.

In this study, the attitude of farm women toward agriculture as an “enterprise” is operationally defined as the extent to which they hold positive or negative feelings about agriculture as a business activity.

To measure the attitude level of farm women in a systematic and accurate manner, and to ensure the proper development of the research instrument, the following steps were undertaken.

1. Item selection.
2. Preparation of statements.
3. Item analysis.

4. Testing reliability of the scale.
5. Testing validity of the scale.
6. Final format of attitude scale.
7. Administration of attitude scale

1 Item selection

Seven components namely risk aversion or risk-taking ability, innovational attitude, social attitude, managerial attitude, economic attitude, perceived stressfulness, and satisfaction with agriculture as an enterprise were identified and selected to assess the attitude of farm women. These components were determined based on a review of relevant literature and consultations with extension experts.

2. Preparation of statements

Initially, ninety-eight statements reflecting the attitudes of farm women toward agriculture as an enterprise were developed based on available literature, research articles, publications, and consultations with specialists in extension, economics, and agricultural field officers. These statements were edited according to the criteria suggested by Thurstone (1967) ^[11], Likert (1932) ^[6], and Edward (1957) ^[5].

After the editing process, seventy-nine statements were retained out of the original ninety-eight. The selected statements were clear, non-ambiguous, and non-factual in nature.

3 Item analysis (Selection of the Judges)

These statements were subsequently reviewed by a panel of expert judges to assess their relevance. For this purpose, 120 judges specializing in extension education, sociology, and economics from various agricultural universities across India were selected to provide their valuable opinions on the statements.

The judges were asked to rate each statement on a three-point continuum: ‘most relevant,’ ‘relevant,’ and ‘not relevant.’ For positive statements, scores of 3, 2, and 1 were assigned respectively, whereas for negative statements, the scoring pattern was reversed (1, 2, and 3). The judges were also invited to suggest additional items they considered suitable for inclusion in the scale.

Out of the 120 judges contacted, 91 responded and returned the duly completed schedules. The details are presented in the following table.

Table 1: Judges contacted and responses received

Sr. No.	Particulars	Number of judges contacted	Number of appropriate responses received
1.	Dean, Director	10	03
2.	Head of the Department, Professor/ equivalent	24	22
3.	Associate Professor/equivalent	28	16
4.	Assistant Professor/equivalent	48	45
5.	SMS/ SRA/ PS	10	05
	Total number of judges	120	91

Relevancy test

Based on responses received from the judges, the relevancy weightage, relevancy percentage and mean relevancy score were worked out for all the 79 items individually, using the formulae given by Edward (1957) ^[5].

Relevancy weightage

Following formula was used to work out the relevancy

weightage of each statement.

$$RW = \frac{MRR \times 3 + RR \times 2 + NRR \times 1}{MOS (3 \times 91 = 273)}$$

Where,

RW = Relevancy Weightage

MRR = Most Relevant Response

RR = Relevant Response

NRR = Not Relevant Response

MOS = Maximum Obtainable Score

Relevancy percentage

Relevancy percentage of each statement was computed by using the following formula.

$$RP = \frac{MRR \times 3 + RR \times 2 + NRR \times 1}{MOS (3 \times 91 = 273)} \times 100$$

Where,

RP = Relevancy percentage

MRR = Most Relevant Response

RR = Relevant Response

NRR = Not Relevant Response

MOS = Maximum Obtainable Score

Mean relevancy score

Mean relevancy score of each statement was computed by using the following formula.

$$MRS = \frac{MRR \times 3 + RR \times 2 + NRR \times 1}{\text{Number of judges (91)}}$$

Where,

MRS = Mean Relevancy Score

MRR = Most Relevant Response

RR = Relevant Response

NRR = Not Relevant Response

Based on these three criteria, the statements were evaluated and screened for their relevance. Statements that obtained a relevancy weightage above 0.66, a relevancy percentage exceeding 66.00%, and a mean relevancy score greater than 2 were considered suitable for assessing attitude. As a result of this screening process, a total of 46 statements were finally selected.

Calculation of 't' value (Item analysis)

The 46 selected statements were further subjected to item analysis to identify those items that could effectively

differentiate respondents with a high level of attitude from those with a low level of attitude. For this purpose, 40 respondents were chosen from non-sample areas namely Dagad Dhanora and Shembal Pimpri villages of Pusad taluka, and Mulawa and Navin Sukli villages of Umard taluka in Yavatmal district through direct interviews. The respondents were asked to indicate their level of agreement or disagreement with each statement on a five-point continuum ranging from "strongly agree" to "strongly disagree." The scoring pattern ranged from 5 to 1 for positive statements, with 5 assigned to "strongly agree," 4 to "agree," 3 to "undecided," 2 to "disagree," and 1 to "strongly disagree." For negative statements, the scoring pattern was reversed.

The critical ratio, or 't' value, which indicates the extent to which each statement distinguishes between the high and low respondent groups, was calculated for every item. This was done using the formula recommended by Edward (1957) [5].

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

Where,

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

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

X_H = mean score on given statement of the high group

X_L = mean score on given statement of the low group

$\sum X_H$ = summation of scores on given statement for high group

$\sum X_L$ = summation of scores on given statement for low group

$\sum X_H^2$ = sum of the squares of the individual score on a given Statement for high group

$\sum X_L^2$ = sum of the squares of the individual score on a given Statement for low group

n = number of respondents in each group

Table 2: Attitude of farm women towards agriculture as an enterprise. ('t' value of selected attitude scale statements after item analysis)

Sr. No.	Statements	't' value
A	Risk aversion/taking	
1	It is essential to take the risk for establishing agriculture enterprise.	3.55
2	Decision making in Agriculture Enterprise is not a difficult task for farm women.(-)	3.37
3	Great volatility always exists in the market price of agricultural product.	2.99
4	It is appropriate to take financial risk in agriculture enterprise.	1.58
5	Uncertainty of the weather always minimizes the risk in agriculture enterprises. (-)	1.65
6	It is necessary to take the insurance policy to overcome the most losses in Agricultural Enterprises.	3.86
7	Agriculture and allied enterprises diversification distribute farm women's economic risk.	3.15
B	Innovational attitude:	
1	Farm women should have soil health report while starting agriculture as an enterprise.	3.20
2	Farm women should only continue with traditional farming practices. (-)	2.15
3	Modern technology of running agriculture enterprises helps to get maximum profit.	1.22
4	Modern technologies of agriculture enterprises require lot of money.	3.63
5	Farm women require to try modern technology for agricultural and allied activities.	3.35
C	Social attitude:	
1	Farm women feel that starting agriculture enterprise is respectable enterprise in the society.	1.39
2	Farm women engaged in agriculture enterprise feel self-dependent in society.	3.06
3	Ownership of land should be in the name of farm women.	3.84

4	Agriculture enterprise helps farm women to improve the personal and social status of farm women.	3.37
5	Equal pay for equal work should not be there in agriculture enterprise. (-)	3.60
D	Managerial attitude:	
1	It is necessary to consult with a professional agriculture enterprise adviser before making a decision.	3.35
2	Farm women should use modern record keeping system in agriculture enterprise.	3.06
3	It is important to prepare yearly budget plan by farm women for agriculture enterprise.	3.32
4	Farm women should manage the capital, time and land resources for agriculture enterprise.	3.23
5	Agriculture enterprise will not fail due to lack of planning and poor management. (-)	3.63
6	Overall management is key factor for success in Agriculture enterprise.	1.29
E	Economical attitude:	
1	Agriculture enterprise strengthens the economic sources of farm women.	3.16
2	Financial assistance is essential to set up new agriculture enterprise.	3.50
3	Institutional credit is not available, accessible and affordable.	3.52
4	Farm women can fulfil household liabilities through agriculture enterprise.	1.31
5	It is harmful to farm women to lend institutional loans for agriculture enterprise. (-)	3.45
6	It is difficult to get loan to individual than group of farm women in agriculture enterprise.	2.59
F	Stressfulness:	
1	Unavailability of money in time gives financial stress to farm women in agriculture enterprises.	3.35
2	In agriculture enterprises unpredictable weather is gamble.	4.16
3	Prolonged period of stress lead to depressions in farm women.	0.85
4	Lack of labour during peak period in agriculture enterprise becomes a stressful to farm women.	3.83
5	In agriculture enterprise perishable product transportation is difficult for farm women. (-)	3.23
6	Farm women illiteracy losses the confidence in agriculture enterprise.	1.45
7	It creates tension when farm women feel unable to repay the loan towards agriculture enterprise.	3.50
8	Agriculture as an enterprise would go a long way in the reducing poverty. (-)	1.41
9	Not to develop laws to get the property right of land to farm woman.(-)	4.27
10	Lack of training to farm women in agriculture enterprise is stressful.	3.21
G	Satisfaction	
1	Agriculture enterprise brings a healthy living.	1.73
2	Agriculture enterprise is able to meet the local demand of product.	3.03
3	Optimum utilization of farm resources is not possible in agriculture enterprise. (-)	2.63
4	Agriculture enterprise is a profession which has harmony with nature.	4.03
5	Agriculture is not just an enterprise, but it is way of life.	3.94
6	In agriculture enterprise farm women get freedom to work in own way.	2.59
7	Being agriculture as an enterprise will entail great satisfaction to farm women.	2.60

Selection of statements for scale with 't' values

After calculating the 't' value for all 46 statements, only those items with a 't' value of 1.75 or higher were retained for inclusion in the scale. Consequently, 35 statements were selected for the final scale. The developed scale was then further standardized by assessing its reliability and validity.

3.8.2.4 Testing reliability of scale - test-retest method

A scale is considered reliable when it produces consistent results when used repeatedly to measure the same phenomenon. In this study, the test-retest method was used to assess reliability. The final set of 35 statements, representing the attitude of farm women toward agriculture as an enterprise, was administered on a five-point continuum to a new group of 20 respondents who were not part of the actual sample. After 15 days, the same scale was administered again to the same respondents, producing two sets of scores. The correlation coefficient between the two sets of scores was calculated. The obtained 'r' value of 0.823 was significant at the 0.01 level, indicating that the scale is highly reliable. This shows that the scale is stable and dependable in measuring the attitude of the respondents.

3.8.2.5. Testing validity of the scale

Validity refers to the extent to which an instrument measures what it is intended to measure. In this study, the developed scale was evaluated for content validity. According to **Fred N. Kerlinger (1976), content validity is

the extent to which the content of an instrument adequately represents the subject matter or domain it is intended to measure. Content validity was established for the present scale by ensuring that the items comprehensively covered the entire domain of agriculture as an enterprise. This coverage was based on a thorough review of literature and the opinions of a panel of 91 expert judges in extension education and economics. The judges assessed the relevance of the items to determine whether they should be included in the scale. Since the selected statements demonstrated high discriminating power, the scale was considered to be a valid measure of farm women's attitudes toward agriculture as an enterprise. Therefore, the scale was found to possess a satisfactory degree of validity.

Result and Discussion

The final scale which would measure the attitude of farm women toward agriculture as an enterprise was considered of 35 statements out of that 28 statements are positive statements while seven are negative statements. The 35 statements selected for the final format of attitude scale were randomly arranged to avoid response biases. The scale can be administered on five-point continuum i.e. 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' by giving score 5, 4, 3, 2 and 1 for positive statements and 1, 2, 3, 4 and 5 for negative statements. Therefore, the overall possible attitude score of the individual respondent towards agriculture as an enterprise

could range from 35 to 175. The high score of scale will represent the favorable attitude of farm women towards the agriculture as an enterprise.

Thus, Attitude score of the Farm women were obtained by

summation of score of all the statements included in the scale and they were grouped into three categories i.e. less favorable, moderately favorable and highly favorable by using equal interval method.

Table 3: Final format of the attitude scale

Sr. No.	Statements	SA	A	UA	DA	SDA
A	Risk aversion/taking					
1	It is essential to take the risk for establishing agriculture enterprise.					
2	Decision making in Agriculture Enterprise is not a difficult task for farm women. (-)					
3	Great volatility always exists in the market price of agricultural product.					
4	It is necessary to take the insurance policy to overcome the most losses in Agricultural Enterprises.					
5	Agriculture and allied enterprises diversification distribute farm women's economic risk.					
B	Innovational attitude:					
1	Farm women should have soil health report while starting agriculture as an enterprise.					
2	Farm women should only continue with traditional farming practices. (-)					
3	Modern technologies of agriculture enterprises require lot of money.					
4	Farm women require to try modern technology for agricultural and allied activities.					
C	Social attitude:					
1	Farm women engaged in agriculture enterprise feel self-dependent in society.					
2	Ownership of land should be in the name of farm women.					
3	Agriculture enterprise helps farm women to improve the personal and social status of farm women.					
4	Equal pay for equal work should not be there in agriculture enterprise. (-)					
D	Managerial attitude:					
1	It is necessary to consult with a professional agriculture enterprise adviser before making a decision.					
2	Farm women should use modern record keeping system in agriculture enterprise.					
3	It is important to prepare yearly budget plan by farm women for agriculture enterprise.					
4	Farm women should manage the capital, time and land resources for agriculture enterprise.					
5	Agriculture enterprise will not fail due to lack of planning and poor management. (-)					
E	Economical attitude:					
1	Agriculture enterprise strengthens the economic sources of farm women.					
2	Financial assistance is essential to set up new agriculture enterprise.					
3	Institutional credit is not available, accessible and affordable.					
4	It is harmful to farm women to lend institutional loans for agriculture enterprise. (-)					
5	It is difficult to get loan to individual than group of farm women in agriculture enterprise.					
F	Stressfulness:					
1	Unavailability of money in time gives financial stress to farm women in agriculture enterprises.					
2	In agriculture enterprises unpredictable weather is gamble.					
3	Lack of labour during peak period in agriculture enterprise becomes a stressful to farm women.					
4	In agriculture enterprise perishable product transportation is difficult for farm women. (-)					
5	It creates tension when farm women feel unable to repay the loan towards agriculture enterprise.					
6	Need to develop laws to get the property right of land to farm woman.					
7	Lack of training to farm women in agriculture enterprise is stressful.					
G	Satisfaction					
1	Agriculture enterprise is able to meet the local demand of product.					
2	Optimum utilization of farm resources is not possible in agriculture enterprise. (-)					
3	Agriculture enterprise is a profession which has harmony with nature.					
4	Agriculture is not just an enterprise, but it is way of life.					
5	In agriculture enterprise farm women get freedom to work in own way.					

4. Conclusion

The present study successfully developed and standardized an attitude scale to measure the attitude of farm women towards agriculture as an enterprise in the western Vidarbha region of Maharashtra. The final scale consists of 35 carefully selected statements that adequately represent the multidimensional nature of attitude related to agricultural entrepreneurship. High reliability and satisfactory content validity indicate that the scale is consistent, stable, and capable of measuring the intended construct accurately. This standardized instrument can serve as a valuable tool for researchers, policymakers, and extension professionals to diagnose attitude levels, design need-based capacity-building programmes, and evaluate the impact of

interventions aimed at promoting agriculture as an enterprise among farm women. With suitable contextual modifications, the scale may also be applied in other regions to facilitate comparative studies and contribute to strengthening women's participation and empowerment in agriculture

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