Scale to measure attitude of rural youth towards retention of rural youth in agriculture for livelihood security

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Abstract

Agriculture in India faces a dual challenge—meeting the rising food demand while dealing with shrinking farm sizes and declining land availability due to urbanization and industrialization. With the world population expected to surpass 850 crores by 2025, sustainable agricultural growth is crucial. Despite agriculture being the backbone of the Indian economy, its contribution to national income has declined significantly, from 50% at independence to 25% by 2000. Moreover, global investment in agricultural research and infrastructure has reduced, further complicating the situation. India's youth, constituting a significant portion of the rural population, hold the key to revitalizing agriculture. Encouraging their active participation requires understanding and addressing the barriers they face in farming. Given the importance of studying rural youth towards retention of rural youth in agriculture for livelihood, a scale has been developed to measure these attitudes. The Scale Product Method was employed, which combines Thurstone's technique of equal appearing interval scale for item selection with Likert's technique of summated rating. The development process began with identifying key aspects and collecting relevant items. This was followed by a relevancy and item analysis, and finally, checking the reliability and validity to ensure precision and consistency of the results. Initially, 45 statements were selected, and through this process, 12 statements were ultimately retained in the scale to measure the attitude of rural youth towards retention of rural youth in agriculture for livelihood. The developed scale was found to be reliable.

Introduction

India's rural economy, heavily reliant on agriculture, faces significant challenges in maintaining its vitality. With a growing population and shrinking farm sizes, the nation's food security hinges on attracting and retaining its youth in farming. Historically, agriculture's contribution to India's national income has declined, and global investment in agricultural development has decreased, highlighting a critical need for revitalization. Rural youth, a substantial portion of India's population, possess the potential to drive this change, but they are increasingly drawn to urban opportunities. Factors such as low returns, perceived social status, and limited access to resources contribute to their disinterest in farming. To address this, the government and institutions like ICAR are implementing initiatives to skill and empower rural youth, promoting entrepreneurship and modern agricultural practices. Understanding the attitudes and perceptions of these youth towards agriculture is crucial for developing effective strategies to ensure their engagement and secure the future of India's agricultural sector.

Objective

To develop and standardize a scale to measure attitude of rural youth towards retention in agriculture for livelihood security

Materials and Methods

Among available techniques for the construction of the scales, the Thurston's Equal Appearing Interval Scale (1928) and the Likert's Summated Rating Scale (1932) are quite well-known. However, both these methods suffer from the limitations, the first one in getting discriminating response and second one in the selection of items. Thus, the technique chosen to construct the attitude scale was "Scale Product Method" which combines the Thurston's technique of equal appearing interval scale for selection of the items and Likert's technique of summated rating for ascertaining the response on the scale as proposed by Eysenck and Crown (1949). The procedures are followed as followed by Chauhan *et al.* (2022), Meenu et al. (2022) Yeragorla et al. (2021), Jagadeeswari et al. (2019) and Vinaya et al. (2018).

Steps in construction of attitude scale

Steps in development of the attitude scale explained as below:

Item selection

The items of attitude scale refer to statements related to attitude. Primarily, large number of statements reflecting attitude towards working in rural area were collected from relevant literature and constructed through discussion with extension personnel. The statements thus selected were edited on the basis of criteria shown by Edwards (1957) and at last, 45 statements were selected as they were found to be non-ambiguous. The selected statements are presented in Table 1.

Table 1: Selection of statements on the basis of 'S' and 'Q' value to measure attitude of rural youth towards retention in agriculture for livelihood security

Statements no.	S Value	Q Value	Consent
22	4.93	3.89	**Accepted**
23	4.61	3.18	**Accepted**
39	4.18	4.18	Rejected
4	4.10	4.01	Rejected
15	4.00	5.09	Rejected
17	3.86	4.27	Rejected
5	2.44	2.26	**Accepted**
7	2.44	5.01	Rejected
16	2.25	4.93	Rejected
11	2.18	3.29	Rejected
26	2.07	3.81	Rejected
18	2.06	3.02	Rejected
36	2.00	5.30	Rejected
24	1.95	2.97	Rejected
9	1.93	3.69	Rejected
37	1.90	3.01	Rejected
38	1.90	1.90	Rejected
3	1.86	1.20	**Accepted**
35	1.86	3.18	Rejected
31	1.85	1.28	Rejected
20	1.80	1.27	Rejected
40	1.79	1.12	Rejected
30	1.77	1.18	Rejected
45	1.77	1.18	Rejected
32	1.74	1.21	Rejected
12	1.72	1.32	**Accepted**
21	1.69	1.19	Rejected
10	1.67	1.09	**Accepted**
43	1.66	1.25	Rejected
33	1.64	3.59	Rejected
25	1.64	1.14	**Accepted**
28	1.63	0.11	Rejected
13	1.63	1.36	Rejected

27	1.61	1.22	Rejected
19	1.60	1.15	**Accepted**
29	1.50	1.28	Rejected
42	1.50	1.19	**Accepted**
14	1.46	1.07	Rejected
2	1.42	4.31	Rejected
6	1.39	1.15	**Accepted**
41	1.39	1.28	Rejected
1	1.36	1.14	Rejected
44	1.33	1.08	**Accepted**
8	1.28	0.98	**Accepted**
34	1.27	1.03	Rejected

Judges rating of attitude statements:

Probably, all the collected statements may not be appropriate equally in measuring the attitude for present study therefore, these were subjected to scrutiny for its appropriateness by the judges. The five points equal appearing interval continuum was used to judge each statement on the degree of five-point continuum namely, 'Very important', 'Important', 'Moderately important' 'Slightly important' and 'Not important'. The scoring pattern was 5, 4, 3, 2, 1 for positive and 1, 2, 3, 4, and 5 for negative statements respectively. The judges were staff members of the cadre of Assistant Professor and above from the Agricultural Extension Department of State Agriculture Universities and Indian Council of Agricultural Research Institutions and prepared schedule which contents 47 items was sent for judging the relevancy. The schedule was sent via post and online through 'Google forms' to judges 142 with request to analyze the relevancy of items. Out of the total, 65 judges had responded. The investigator has found that some of the judges have responded very carelessly, misunderstand the directions and not be aware of the judgments desired in scale construction hence, 15 schedules were eliminated. Lastly, 50 schedules were kept for the construction of scale.

Determination of scale and quartile value

The five points of the rating scale were assigned score ranking from 1for not important and 5 for very important. The responses of 50 judges on 47itemsweretransferred into the master sheet.

The appropriateness and relevancy was calculated by using statistics advocated by 'Scale Product Method'. Based on judgement, the Median value of distribution and the Quartile value (Q) for the statement concerned were calculated. The following procedure was use for calculation of S and Q values.

$$S = L + \frac{0.50 - \sum Pb}{Pw} \times i$$

Where,

S = Median or Scale value of statement
L = Lower limit of the interval in which the median falls
$\sum P_b$ = Sum of the proportion below the interval in which the median falls
P_w = Proportion within the interval in which the median falls
i = Width of the interval which was assumed as equal to 1.0(One).

$$C_{25} = L + \frac{0.25 - \sum Pb}{Pw} \times i$$

Where,

C_{25} = Median or scale value of the statement

L = Lower limit of the interval in which the 25th centile falls

$\sum P_b$ = Sum of the proportion below the interval in which the 25th centile falls

P_w = Proportion within the interval in which the 25th centile falls

i = Width of the interval and is assumed to be equal to 1.0 (one)

$$C_{75} = L + \frac{0.75 - \sum Pb}{Pw} \times i$$

Where,

C_{75} = Median or scale value of the statement

L = Lower limit of the interval in which the 75th centile falls

$\sum P_b$ = Sum of the proportion below the interval in which the 75th centile falls

P_w = Proportion within the interval in which the 75th centile falls

i = Width of the interval and is assumed to be equal to 1.0 (one)

The inter quartile range was worked out for determination of ambiguity involved in the statement by taking the difference between C_{75} (Q3) and C_{25} (Q1), that means Q = C_{75} − C_{25} for each statement. In this manner, the inter-quartile range (Q) for each statement was worked out show in table 1.

Thurstone and Chave (1929) used the inter quartile range Q as a means of the variation of the distribution of the judgments for a given items. Moreover, it was worked out to determine the ambiguity involved in the items. The inter quartile range contents the middle 50 per cent of the judgments. To determine the value of Q, it is

needed to find two other points also, the 75th centile and 25th centile.

Reliability of the scale

The 12 items were divided into two halves, with odd (eight item) number in one half and even (seven) number in the other. These were administered to 20 respondents separately, which were not included in the final sample. Having obtained the two sets of scores for each of the 20 respondents, co-efficient of correlation (reliability co-efficient) between the two sets of scores was calculated. Co-efficient of reliability between these two sets of score was calculated by Rulon's formula (Guilford 1954).

$$rtt = 1 - \frac{\sigma^2 d}{\sigma^2 t}$$

Where,

Rtt = Coefficient of reliability

$\sigma^2 d$ = Variance of those differences

$\sigma^2 t$ = Variance of the total scores

The correction factor is calculated by using Spearman Brown(1910) formula

$$rtt = \frac{2roe}{1 + roe}$$

rtt = Coefficient of the reliability of the original test

roe = reliability of coefficients of odd and even score

Co-efficient of correlation (reliability co-efficient) between the two sets of scores was found to be significant (r = 0.83094). The results obtained from the analysis shown in Appendix I-a reliability co-efficient thus obtained, indicated that internal consistency of the feedback index developed for the study was high.

Validity of the scale

According to Kerlinger (1969), the content validity of the scale was tested. The content

validity is the representative or sampling adequacy of the content, the substance, the matter and the topics of a measuring instrument. This method was used in the present scale to determine the content validity of the scale. As the content of the attitude was thoroughly covered the subject matter under the study through literature and expert opinion, it was assumed that present scale satisfied the content validity.

Results and Discussion

A standardized scale for measuring attitude of rural youth to retaining in agriculture for livelihood security was developed according to scale product method which combines the Thurston's technique of equal appearing interval scale for selection of the items and Likert's technique of summated rating. The selected 12 statements for final format of the attitude scale have been randomly arranged to avoid response bias. The final format of the scale is presented in Table 2. This scale was found to be reliable with a correlation coefficient of 0.830.

Table 2: Final scale to measure attitude to retaining in agriculture for livelihood security

Sr. No.	Statement(s)	SA	A	UD	DA	SDA
1.	I believe that promote agriculture discipline as a compulsory subject in schools. (+)					
2.	I believe that use of more innovative approaches to disseminate agricultural extension messages to entice the youth in farming. (+)					
3.	I believe that agriculture is seen as a masculine occupation. (-)					
4.	I believe that diversification is required to survive in farming. (+)					
5.	I believe that scope of farming can be enlarged in rural youth by adopting post-harvest technology. (+)					
6.	I think that youth is attracted towards white collar jobs. (-)					
7.	I think increased cost of living attracts rural youth towards alternate occupation. (-)					
8.	I think farming is for the school drop outs and illiterate people. (-)					
9.	I think that popularization of crop insurance among rural youth to cope with adverse natural calamities. (+)					
10.	I think Rural youth are reluctant to adopt farming as major occupation. (-)					
11.	I think that minimum support price (MSP) by government helps rural youth during adverse situation. (+)					
12.	I think innovative farming enterprises offer an effective way to retain youth in farming. (+)					

SA=Strongly Agree; A=Agree; UD=Undecided; DA= Disagree; SDA=Strongly Disagree

Administration of the scale

The selected 12 statements for the final format of the attitude scale were randomly arranged to avoid the response biases, which might contribute to low reliability and detraction from validity of the scale. Out of the 12 selected statements, 05 statements were the indicators of the unfavorable attitude and 07 statements were the indicators of favorable attitude. Against these 12 statements, there were five columns representing five points continuum of agreement and disagreement to the statements as stated by Likert (1932) in his Summated Rating Technique to measure the attitude. The five points continuums were strongly agree, agree, undecided, disagree and strongly disagree with respective weights of 5, 4, 3, 2, and 1 for the favourable statements and with the respective weights of 1, 2, 3, 4 and 5 for the unfavorable statements. The total attitude score for each respondent was obtained by adding all the scores of their responses of all the statements and by following the arbitrary method of calculation, lower score is subtracted from the higher score and divided by the number of categories. The obtained score is added into the lower score until you get the highest score. Thus, the respondents were grouped into five categories as follow.

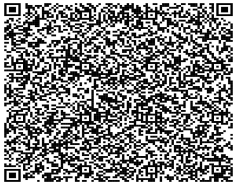| Sr. No.	Category	Score
1	Very low level of attitude	00-21.6
2	Low level of attitude	21.7-31.2
3	Medium level of attitude	31.3-40.8
4	High level of attitude	40.9-50.4
5	Very High level of attitude	50.5-60

Conclusion

The attitude scale developed to measure rural youth's attitude towards retention in agriculture for livelihood security is a significant tool for understanding their engagement with the agricultural sector. Using Thurstone's equal appearing interval scale and Likert's summated rating technique, the scale was designed to capture relevant attitudes accurately. The process involved identifying key aspects and conducting item analysis to ensure precision. Initially, 47 statements were considered, and after thorough evaluation, 12 items were retained. The scale's reliability and validity were rigorously tested, ensuring consistency and accuracy in measuring attitudes. This refined scale offers a reliable method for assessing rural youth's attitudes towards agriculture. It can be adapted for use in different regions and contexts, providing valuable insights for researchers and policymakers. By measuring these attitudes, the scale can inform strategies to enhance agricultural retention among youth, promoting livelihood security. This tool will support the development of targeted interventions to improve rural youth involvement in agriculture.

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