A Scale to Measure Attitude of Farmers towards Agricultural Schemes for Sustainable Livelihood

E. Sathyapriya[1] and M. Asokhan[2]

ABSTRACT

Agriculture schemes are formulated to induce the agricultural growth of the nation and also improve the sustainable livelihood of the farming community. The study aims to develop a scale to measure the attitude of farmers towards agricultural schemes for sustainable livelihood of agrarians. Thurstone and Chave's (1929) equal appearing intervals scale method was adopted to develop the scale. The final scale comprised ten statements which are having universe of content, uniform distribution of scale values along the psychological continuum and high "scale values" and lower "Q" values and more or less equal number of favourable and unfavourable attitude items.

Agriculture and farmers are the backbone of India. However, agriculture's share in India's economy has progressively declined to less than 15.00 per cent. The major challenges in India are, nearly three-quarters of India's families depend on rural incomes, and India's food security depends on producing cereal crops, as well as increasing its production of fruits, vegetables and milk to meet the demands of a growing population with rising incomes. To do so, a productive, competitive, diversified and sustainable agricultural sector will need to emerge at an accelerated pace, with this aim many of the agricultural schemes are formulated.

Hence, this research paper aims to develop the scale to measure the attitude of farmers towards the agricultural schemes for sustainable livelihood.

METHODOLOGY

The scale was constructed by following "Equal Appearing Interval" scaling technique developed by Thurstone and Chave (1929). For the purpose, attitude was operationalized as the degree of positive or negative affect of the farmers about agricultural schemes.

Possible statements concerning the pshychological object "agricultural schemes" were collected based on the review of literature

[1] Ph.D Scholar and [2] Professor and Head, Dept. of Agricultural Extension and Rural Sociology, Tamil Nadu Agricultural University, Coimbatore-641 003.

and discussion with scientists and from extension personnel. In total, 100 statements were prepared which were organized and structured in the form of attitude items. The items were screened by following the informal criteria suggested by Edwards (1969). Based on the screening, 82 items were selected which formed the universe of the content. The selected items includes both positive and negative statements.

The 82 statements were then subjected to judges opinion on a five-point continuum ranging from most unfavourableto most favourable. The items were screened by following the informal criteria suggested by Edwards (1969) for editing the statements to be used in the construction of the attitude scale. The list of statements was sent to 75 judges who comprised of scientists of state agricultural universities, ICAR and Krishivigyan Kendra. Among the 75 judges, 42 judges responded by sending their judgments. Based on the judgments the "S" and "Q"values for each statement were calculated by applying the equal appearing scale Interval formula as suggested by Thurstone and Chave (1929).

The S value obtained from the following formula

$$S = l + \left(\frac{0.5 - \sum p_b}{p_w} \right) i$$

S – The median or scale value of the statement

l – The lower limit of the interval in which the median falls

$\sum p_b$ The sum of the proportions below the interval in which the median falls

p_w – The proportion within the interval in which the median falls

i – The width of the interval and is assumed to be equal to 1.0

Thurston and Chave(1929) used the interquartile range or Q as a measure of the variation of the distribution of judgments for a given statements. To determine the Q value, need to find two other point measures, the 75th centile and the 25th centile.

The 25th Centile (C_{25}) obtained from the following formula

$$C_{25} = l + \left(\frac{0.25 - \sum p_b}{p_w} \right) i$$

The 75th Centile (C_{75}) obtained from the following formula

$$C_{75} = l + \left(\frac{0.25 - \sum p_b}{p_w} \right) i$$

Inter quartile range (Q) value = C_{75}-C_{25}

Scale Reliability

Pearson's product moment correlation co-efficient:

$$r_{xy} = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n} \right) \times \left(\sum y^2 - \frac{(\sum y)^2}{n} \right)}}$$

Where,

N = Sample size
x = Odd test
Y = Even test

$\sum xy - (\sum x)(\sum y)/n$ = Sum of product of x and y

$\sum x^2 - (\sum x)^2/n$ = Sum of square of x

$\sum y2 - (\sum y)^2 / n$ = Sum of square of y

Spearman-Brown Formula

$$r_{tt} = \frac{2r_{hh}}{1 + r_{hh}}$$

Where,

r_{tt}- Reliability of a test estimated from reliability of one of its halves (Reliability coefficient of the whole test)

r_{hh} - Self correlation of a half test (Reliability coefficient of the half test)

FINDINGS AND DISCUSSION

Based on the calculation, Individual statements with "S" and "Q" values are presented in Table 1.

Item selection

The final attitude items were selected based on the universe of content, uniform distribution of scale values along the psychological continuum and high "scale values" and smaller "Q" values and more or less equal number of favourable and unfavourable attitude items. The scale values were arranged in descending order of magnitude and the difference between the successive scale values and the cumulative total of the computed differences were worked out. Since the selected scale values should have equal appearing interval and distributed uniformly along the psychological continuum it was necessary to form ten compartments so as to select ten statements with one statement from each of the compartment. The basis for forming the compartments was that, each compartment should be equally spaced in the continuum. For this purpose, the cumulative value (2.57) was divided by ten, which worked out to 0.257and this formed the width of the first class interval. The second interval was worked out by adding the value with the width of the first class interval. Subsequently all the ten intervals were worked out.

Ten Compartments

Compartment I	:	0.257
Compartment II	:	0.257+ 0.257 =0.51
Compartment III	:	0.514+0.257= 0.771
Compartment IV	:	0.771+0.257= 1.028
Compartment V	:	1.028+0.257 = 1.285
Compartment VI	:	1.285 + 0.257 = 1.542
Compartment VII	:	1.542 +0.257 = 1.799
Compartment VIII	:	1.799+0.257=2.056
Compartment IX	:	2.056 + 0.257= 2.313
Compartment X	:	2.313 + 0.257=2.57

To select the attitude items from the ten compartments the "scale values" and the corresponding "Q" values were considered. Based on the criteria already mentioned items having high "scale values" and low "Q" values were selected with one item from each compartment. Care was taken to ensure that the selected items represented the universe of content and covered the different aspects of agricultural schemes. Thereby ten items were selected with equal appearing interval and with a uniform distribution along the psychological continuum. The attitude scale thus constructed is given in Table 2.

Table 1.

Computation of Equal Appearing Interval Scale

Statement Number	Q Value	S Value	Difference	Cumulative frequency	Equal appearing class interval	Compartments
71	3.33	0.14				
2	1.48	0.29	0.14			
7	2.07	0.29	0.00	0.14		
15	2.39	0.29	0.00	0.14		
18	1.75	0.29	0.00	0.14		
24	2.42	0.29	0.00	0.14		
32	1.07	0.29	0.00	0.14		
39	1.74	0.29	0.00	0.14	0.26	I
42	2.40	0.29	0.00	0.14		
52	2.29	0.29	0.00	0.14		
61	1.57	0.29	0.00	0.14		
62	3.06	0.29	0.00	0.14		
65	-0.11	0.29	0.00	0.14		
76	2.57	0.29	0.00	0.14		
16	2.50	0.50	0.21	0.36	0.51	II
54	2.00	0.75	0.25	0.61	0.77	III
47	2.13	0.83	0.08	0.69		
6	2.10	1.00	0.17	0.86		
12	0.57	1.00	0.00	0.86		
23	2.70	1.00	0.00	0.86		
34	2.25	1.00	0.00	0.86		
35	3.65	1.00	0.00	0.86		
44	2.93	1.00	0.00	0.86		
45	2.51	1.00	0.00	0.86		
46	3.33	1.00	0.00	0.86		
57	2.08	1.00	0.00	0.86	1.03	IV
60	0.60	1.00	0.00	0.86		
63	2.33	1.00	0.00	0.86		
77	2.64	1.00	0.00	0.86		
79	1.75	1.00	0.00	0.86		
59	2.57	1.13	0.13	0.98		
38	3.89	1.14	0.02	1.00		
50	2.22	1.14	0.00	1.00		

A Scale to Measure Attitude of Farmers towards Agricultural Schemes for Sustainable Livelihood

Statement Number	Q Value	S Value	Difference	Cumulative frequency	Equal appearing class intervel	Compartments
19	2.11	1.25	0.11	1.11		
8	4.25	1.29	0.04	1.14		
82	1.75	1.33	0.05	1.19	1.29	V
36	1.89	1.38	0.04	1.23		
37	2.13	1.38	0.00	1.23		
10	1.64	1.50	0.13	1.36		
11	0.76	1.50	0.00	1.36		
53	0.86	1.50	0.00	1.36		
55	2.29	1.50	0.00	1.36		
56	4.64	1.50	0.00	1.36		
66	0.09	1.50	0.00	1.36		
73	1.17	1.50	0.00	1.36		
27	2.60	1.56	0.06	1.41		
22	3.23	1.60	0.04	1.46	1.54	VI
28	1.29	1.60	0.00	1.46		
49	1.00	1.60	0.00	1.46		
14	2.40	1.63	0.02	1.48		
51	0.67	1.63	0.00	1.48		
3	1.56	1.67	0.04	1.52		
33	1.67	1.67	0.00	1.52		
67	-0.33	1.67	0.00	1.52		
20	1.55	1.71	0.05	1.57		
70	1.42	1.71	0.00	1.57		
74	1.95	1.71	0.00	1.57		
40	8.36	1.78	0.06	1.63		
25	0.89	1.80	0.02	1.66	1.80	VII
29	4.83	1.80	0.00	1.66		
41	0.17	1.80	0.00	1.66		
43	-1.45	1.82	0.02	1.68		
75	5.56	1.83	0.02	1.69		

Statement Number	Q Value	S Value	Difference	Cumulative frequency	Equal appearing class intervel	Compartments
4	1.74	2.00	0.17	1.86		
9	-0.85	2.00	0.00	1.86		
13	4.52	2.00	0.00	1.86		
21	0.86	2.00	0.00	1.86		
26	1.15	2.00	0.00	1.86		
30	1.50	2.00	0.00	1.86		
31	1.39	2.00	0.00	1.86	2.06	VIII
48	1.56	2.00	0.00	1.86		
58	1.82	2.00	0.00	1.86		
64	-0.63	2.00	0.00	1.86		
68	5.00	2.00	0.00	1.86		
78	6.60	2.00	0.00	1.86		
69	3.89	2.17	0.17	2.02		
17	1.39	2.25	0.08	2.11		
80	-1.33	2.40	0.15	2.26		
5	-0.91	2.57	0.17	2.43	2.31	IX
81	0.83	2.60	0.03	2.46		
1	1.51	2.67	0.07	2.52		
72	-1.71	2.71	0.05	2.57	2.57	X

Scale Reliability

The reliability of the scale was determined by 'split – half ' method. The ten selected attitude items were divided into two equal halves by odd even method. The two halves were administered separately to 30 farmers in a non-sample area. The scores were subjected to product moment correlation test in order to find out the reliability of the half-test by using SPSS software. The half-test reliability coefficient (r) was 0.585 which was significant at one per cent level of probability. Furtherthe reliability coefficient of the whole test was computed using the Spearman-Brown Prophecy formula. The whole test reliability (r_{tt}) was 0.734. When the purpose of the test is to compare the mean scores of two groups of narrowrange a reliability coefficient of 0.50 or 0.60 would suffice. Hence, the constructed scale is reliable as the reliable coefficient (r_{tt}) was >0.60.

Content Validity of the Scale

Content validation was carried out by subjecting the selected ten items to judge's opinion.The judges were requested to indicate their presumed relevance to which the

A Scale to Measure Attitude of Farmers towards Agricultural Schemes for Sustainable Livelihood

Table 2.
Selected Attitude Statements

Statement No.	Statements	Q Value	S Value	Nature of the statement
72	Effective promotional strategies strengthen the farmers – extension relationship.	-1.71	2.71	Favourable
80	Value addition schemes improve the economy of farmers.	-1.33	2.40	Favourable
9	Agricultural Minimum Support price is encouraging the farmers to diversify to higher value crops.	-0.85	2.00	Favourable
43	Agricultural schemes are designed to strengthen the complete value chain of the agriculture.	-1.45	1.82	Favourable
67	Agricultural schemes strengthen the technical know- how among farming community.	-0.33	1.67	Favourable
12	Adoption rate of new technologies increased by agricultural schemes.	0.57	1.00	Favourable
65	Crop rotation practices are ensured by the agricultural schemes.	-0.11	0.29	Favourable
82	Farmers depend on agricultural schemes only for incentives/subsidies.	1.75	1.33	Unfavourable
54	Agricultural schemes focus on gender development instead of overall agricultural development.	2.00	0.75	Unfavourable
16	Agricultural schemes support the development of large scale enterprises alone.	2.50	0.50	Unfavourable

attitude items covered the different aspects of agricultural schemes. The responses were obtained on a four-point continuum of 'most adequately covered', 'more adequately covered', 'less adequately covered' and 'least adequately covered'. Scores of 4, 3, 2 and 1 were given for the points on the continuum respectively.

Totally 30 judges responded by sending their judgments. The mean score 2.5 was fixed as the basis for deciding the content validity of the scale. If the overall mean score of the attitude items as rated by the judges was above 2.5 the scale will be declared as valid and if not otherwise. In the present case the overall mean score was worked out as

The scoring procedure is as follows,

Nature of the statement	Continuum				
	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
Positive statements	5	4	3	2	1
Negative statements	1	2	3	4	5

3.51 and therefore the constructed attitude scale is said to be valid.

Administration of the Scale Value

The ten attitude items selected were arranged randomly in order to avoid biased responses. The scale was administered on a five point continuum as strongly agree, agree, undecided, strongly disagree and disagree. The score obtained for each statement was summed up to arrive at the attitude score for the respondents. The score ranged from 50 (maximum) to 10 (minimum). Maximum score revealed a favourable attitude, while a minimum score indicated unfavourable attitude towards agricultural schemes for livelihood diversification. The responses were grouped as unfavourable, moderately favourable and highly favourable based on the cumulative frequency method.

The various methods available for constructing of an attitude scale, Equal Appearing Interval method scaling technique was used in this study to measure the attitude of farmers towards agricultural schemes. The scale would be highly useful to study the attitude on agricultural scheme by the farmers and other agriculture stakeholders.

REFERENCES

Edwards L. Allen, (1969). *Techniques of attitude scale construction*. Vakils, Feffer and Simons Private limited, Bombay, India, pp 83-117.

Thurstone & Chave. (1929). *The measurement of attitudes*. Chicago University Press, Chicago, 97p.