Original Research Article

A Scale to Measure the Attitude of Organic Farmers towards Paramparagrat Krishi Vikas Yojana ~~(PKVY)~~

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ABSTRACT

Organic farming is considers as the medium and long term effect of agricultural interventions on the agro ecosystem. A scale has been developed for the study of attitude of organic famers towards PKVY. Attitude is a behavioural construct that cannot be measured by a single variable, hence there arise a need for developing a standardized instrument for its measurement. A method of Equal-Appearing Intervals was used to construct the attitude scale. A total of 82 attitude statements about conservation agriculture practices expressing varied degree of favourableness were collected and modified based on the Edward's criteria. These statements were subjected to judge's opinion by agricultural extension scientists of State Agricultural Universities and ICAR Research Institutes and field level extension workers. Based on expert's response a standardized scale has been developed with 10 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. The selected statements were tested with validity and reliability.

Keywords: Attitude, Organic farming, Equal – Appearing scale, S value, Q value

1. INTRODUCTION

Agriculture plays a crucial role in the part of Indian economy. Chemical use has increased under intensive cultivation, disrupting the balance between soil, plant, and human health. Chemical additives are being used by farmers to increase crop productivity, but this is just destroying the environment. Farmers were confronted with a slew of socioeconomic issues, particularly small farmers who were more excluded due to a lack of access to foreign inputs. The frequent application of harsh and hazardous chemicals has depleted their soil. Organic farming's goal is to improve or maintain the overall quality and health of the soil ecosystem. Agriculture's long-term viability is dependent on fruitful soil. During the last several decades, many research have focused on improving output and protecting environmental quality under various farming systems, and those studies show that employing organic fertilizers in organic farming has increased crop yields and enhanced food security around the world. Organic food and farming have continued to grow across the world. Since 1985, the total area of farmland under organic production has been increased steadily over the last three decades (Willer and Lernoud, 2019).

In India, organic farming is still in its infancy. According to the Union Ministry of Agriculture and Farmers' Welfare, about 2.78 million hectares of cropland were under organic agriculture in March 2020. This represents 2% of the country's total net sown area of 140.1 million ha. The "Paramparagat Krishi Vikas Yojana" (PKVY) scheme is an extended component of Soil Health Management (SHM) of major project National Mission of Sustainable Agriculture (NMSA). Organic farming is encouraged under the PKVY scheme through the adoption of an organic village cluster strategy and PGS certification. To expand the importance of the PKVY scheme in enhancing organic farming, it is vital to understand organic farmers' attitudes regarding the scheme. In this instance, the study was designed with the objective to develop a scale to measure the attitude of organic farmers towards PKVY scheme.

2. METHODOLOGY

Thurstone and Chave? devised the equal seeming interval scaling technique, which was used to create the attitude scale (1927). Initially, a set of items and statements related to farmers' attitudes toward conservation agriculture practices were gathered and developed based on a review of the literature, consultation with experts from State Agricultural Universities and ICAR Research Institutes, as well as the researcher's field experience. A preliminary list of 100 statements was created with the application of statements relevant to the study topic in mind. The statements gathered were carefully vetted using Edwards' 14 informal criteria (1957). The statements were carefully edited to ensure that they could measure what was meant. As a result, there are 60 statements in all.

Table 1. Universe of statements related to the attitude of farmers towards PKVY scheme

S. No.	STATEMENTS
1.	PKVY scheme provides possible solutions to the organic farmers
2.	Consumption of organic products from PKVY scheme has improved the health
3.	The cluster approach by PKVY strengthens farmers who practice organic farming
4.	PKVY promotes chemical free methods for crop cultivation
5.	PKVY ensures certification in Participatory Guarantee System (PGS – India)
6.	PKVY integrates farmers with traditional resources to promote organic farming
7.	PKVY does not focus on building up soil fertility
8.	PKVY has improved the income of the practioners
9.	Direct market linkages possible through PKVY
10.	PKVY helps farmers in certification of their organic products
11.	PKVY promotes the production of botanical pesticides
12.	Transparency in selecting the Lead Resource Person
13.	PKVY is a potential scheme to reach the needy organic farmers
14.	PKVY paves the way for farmers with organic ideologies
15.	PKVY involves complex procedures in enrollment for organic certification
16.	Only resourceful farmers can be enrolled in PKVY scheme
17.	The demand for organic products among consumers has been met out by PKVY
18.	Specific technologies for irrigated and rainfed situations are suggested by PKVY
19.	Difficulties during registration are faced by the farmers on PKVY scheme
20.	PKVY is a farmer friendly approach
21.	Cost of cultivation is reduced by PKVY
22.	Domestic production of organic products is increased
23.	Organic certification is made possible through PKVY scheme
24.	Training programmes conducted under PKVY on organic production practices were effective
25.	Demonstrations conducted under PKVY are not able to be followed by the organic

	farmers
26.	Exposure visits are useful in observing the benefits of successful farmers
27.	Delayed release of funds for PKVY scheme
28.	Increased in purchase of organic inputs (GLM, FYM, compost and organic seeds) under PKVY
29.	Awareness on biological nitrogen harvesting plants are created by PKVY
30.	Natural pest control agents like Neem oil are not promoted by PKVY
31.	Purchase on chemical fertilizers and pesticides are increased after enrolling in PKVY
32.	Poor identification of potential crops and locations by PKVY
33.	PKVY has encouraged the involvement of private companies in marketing with huge profit
34.	The PGS – India web portal enables huge profit for farmers to track their products easily
35.	There is nothing new in PKVY scheme
36.	PKVY won't make any difference in the farming community
37.	The process involved in PKVY complex in nature
38.	PKVY improves the socio- economic status of the farming community
39.	Relative advantage of PKVY is very less than other related schemes
40.	The subsidies of PKVY scheme is not sufficient
41.	PKVY scheme provides potential market for the produce
42.	PKVY scheme helps in promoting organic farmers
43.	PKVY scheme motivates natural resource mobilization
44.	PKVY scheme helps to produce residue- free products
45.	PKVY scheme encourage mobilization of farmers and local people to form as groups
46.	PKVY helps to avail farm implements through custom hiring centres
47.	Under PKVY scheme assistance availed timely to the beneficieries
48.	The process of product certification is too lengthy
49.	Meetings and discussions are conducted periodically
50.	Trainings conducted are based on assessed needs of the farmers
51.	Periodical evaluations are done on the fields of cluster farmers to provide suggestions
52.	PKVY scheme encourages the group based approach
53.	Timely subsidies are provided on soil sample testing
54.	Online registration of farmers is an easy process
55.	PKVY scheme will promote organic products production commercially
56.	PKVY have not provide efficient support for farmers to adopt organic farming
57.	Limited support from PKVY to farmers in adopting organic methods.
58.	PKVY degrading the organic farming

59.	I am willing to pay for organic farming certification
60.	PKVY is in line with the needs and problems of organic farmers

(MUF- Most Unfavourable; **UF-** Unfavourable; **N-** Neutral; **F-**Favourable; **MF-** Most Favourable**)**

2.1. Calculations of Scale and Q values

The data obtained from 30 subjects for each statement are arranged in table as frequency and proportions in the first and second row respectively. The proportions are obtained by dividing each frequency by the total number of subjects. The 'S' and 'Q' values given in scale were judged on the basis of 30 respondent's opinion and equal appearing interval which were computed by calculating the median value (S) and their inter quartile range (Q). The objective was to have small number of statements evenly placed on the continuum. The median value is considered as scale value and it was calculated by using following formula.

$$S = l + \frac{0.50 - \sum Pb}{Pw} \text{ i}$$

Where,

S = the median or scale value

l = the lower limit of the interval in which the scale value falls

Pb = the sum of the proportion below the interval in which the scale value falls

Pw = the proportion within the interval in which the scale value falls

l = the width of the interval and it is assumed to be equal to 1.00

Q = C75- C25

Q = inter quartile range; C75 = 75th centile; C25 = 25th Centile

25^{th} centile = C25= $l + \frac{0.25 - \sum Pb}{Pw}$ i

75^{th} centile = C75 = $l + \frac{0.75 - \sum Pb}{Pw}$ i

When there is good agreement among the subjects in judging the degree of favourableness of a statement, Q value will be small. A large Q value indicates disagreement among the judges as to the degree of attribute possessed by a statement and it is, therefore, taken as an indication that there is some ambiguity in the statement. Thurstone & Chave (1929) regard large Q values primarily as an indication that a statement is ambiguous. It is also may be since statement is interpreted in more than one way by the subjects.

2.2. Reliability of the scale

Reliability refers to the consistency of scores obtained by the same individuals when re-examined with the test on different occasions, or with different sets of equivalent items Anastasi (1968). The reliability of the scale was determined by 'split – half' method. The test is divided into two halves in which one half contains the odd-numbered items (1,3,5,7,9) and other half contains the even-numbered items (2,4,6,8,10). A single administration of the two sets of items to a sample of respondents, yields two sets of scores. A positive and significant correlation between the two sets of scores indicates that the test is reliable.

From the self-correlation of the half-tests, the reliability coefficient of the whole test may be estimated by the Spearman-Brown formula, as follows.

$$\textbf{Reliability coefficient of the whole test} = \frac{2 \times \textbf{reliability coefficient of the half test}}{1 + \textbf{reliability coefficient of the half test}}$$

2.3. Validity of the scale

Validity refers to the accuracy with which it measures that which is intended to measure (Lindquist 1951). To test the validity of the scale, content validity method is used. The content validity involves essentially the systematic examination of the test content to determine whether it covers a representative sample behaviour domain to be measured, Anastasi (1968). The content validity of the scale is measured using Experts Judgement method.

3. FINDINGS AND DISCUSSION

Based on the calculation, Individual statements with *"S"* and *"Q"* values are presented in Table 2.

Table 2. Computation of Equal Appearing Interval Scale

S. No	Statement No.	'Q' value	Scale value	Difference between successive 'Scale' value	Cumulative value	Interval	Compartments
1.	11	2.408	2.277				
2.	**14**	**2.269**	**2.418**	**0.141**		**0.19**	**I**
3.	20	2.035	2.500	0.083	0.223		
4.	40	1.950	3.000	0.500	0.231		
5.	**4**	**1.940**	**3.165**	**0.165**	**0.396**	**0.38**	**II**
6.	1	2.038	3.296	0.131	0.527		
7.	12	1.910	3.296	0.000	0.527	**0.57**	**III**
8.	**7**	**1.840**	**3.358**	**0.062**	**0.589**		
9.	30	-0.050	3.500	0.142	0.731		
10.	**21**	**2.065**	**3.500**	**0.000**	**0.731**	**0.76**	**IV**

11.	39	2.125	3.500	0.000	0.782		
12.	42	1.318	3.558	0.058	0.789		
13.	22	0.922	3.566	0.008	0.797		
14.	13	1.755	3.576	0.010	0.807		
15.	43	2.056	3.583	0.006	0.814		
16.	37	1.714	3.590	0.007	0.821		
17.	29	1.821	3.634	0.044	0.865		
18.	50	1.594	3.643	0.009	0.874	**0.95**	**V**
19.	31	1.893	3.643	0.001	0.874		
20.	2	1.594	3.643	0.000	0.874		
21.	51	2.114	3.683	0.039	0.914		
22.	44	1.407	3.688	0.005	0.919		
23.	15	2.095	3.688	0.000	0.919		
24.	49	2.016	3.701	0.014	0.932		
25.	**38**	**1.813**	**3.714**	**0.013**	**0.945**		
26.	56	1.707	3.731	0.017	0.962		
27.	52	1.304	3.750	0.019	0.981		
28.	45	1.969	3.750	0.000	0.981		
29.	58	1.944	3.750	0.000	0.981		
30.	59	1.319	3.778	0.028	1.009		
31.	**16**	**1.405**	**3.785**	**0.006**	**1.142**	**1.14**	**VI**
32.	35	1.457	3.816	0.031	1.173		
33.	3	1.337	3.834	0.018	1.191		
34.	53	1.458	3.834	0.000	1.191		
35.	28	1.170	3.853	0.019	1.210		
36.	34	1.723	3.858	0.005	1.215		
37.	54	1.220	3.875	0.018	1.232		
38.	17	0.714	3.881	0.006	1.239		
39.	33	1.815	3.900	0.019	1.257	**1.33**	**VII**
40.	24	1.400	3.900	0.000	1.257		
41.	48	0.750	3.900	0.000	1.258		
42.	10	0.937	3.911	0.011	1.268		
43.	55	1.106	3.911	0.000	1.268		
44.	57	1.022	3.911	0.000	1.268		
45.	5	1.894	3.918	0.007	1.275		

46.	47	1.008	3.937	0.020	1.294		
47.	19	0.750	3.950	0.013	1.307		
48.	32	1.415	3.962	0.012	1.319		
49.	**60**	**1.810**	**3.962**	**0.000**	**1.337**		
50.	25	0.882	3.971	0.009	1.346		
51.	9	0.600	3.980	0.009	1.355		
52.	27	0.750	3.999	0.019	1.513	**1.52**	**VIII**
53.	46	2.303	4.000	0.001	1.514		
54.	**23**	**0.833**	**4.000**	**0.000**	**1.514**		
55.	**36**	**0.970**	**4.063**	**0.063**	**1.708**	**1.71**	**IX**
56.	8	0.750	4.100	0.037	1.745		
57.	26	1.210	4.117	0.017	1.762		
58.	18	1.142	4.142	0.026	1.788	**1.91**	**X**
59.	6	1.133	4.168	0.011	1.821		
60.	**41**	**1.203**	**4.193**	**0.050**	**1.913**		

3.1. Item selection

The final attitude items were selected based on the universe of content, uniform distribution of scale values along with 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 (7.00) was divided by ten, which worked out to 0.70 and 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 and presented in Table 3.

Table 3. Computation of class interval values

S.No.	Compartments	Interval values
1.	I	0.19
2.	II	0.19+0.19 = 0.38
3.	III	0.38+0.19= 0.57
4.	IV	0.57+0.19=0.76
5.	V	0.76+0.19=0.95
6.	VI	0.95+0.19=1.14
7.	VII	1.14+0.19=1.33
8.	VIII	1.33+0.19=1.52

9.	IX	1.52+0.19=1.71
10.	X	1.71+0.19=1.9

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 conservation agriculture. 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 4.

Table 4. Selected Attitude Statements

Items	Statements	S value	Q value	Nature of statement
14.	PKVY paves way for farmers with organic ideologies	2.418	2.269	Favorable
4.	PKVY promotes chemical free methods of crop cultivation	3.165	1.940	Favorable
7.	PKVY does not focus on building up soil fertility	3.296	1.910	Unfavorable
21.	Cost of cultivation of organic crops is reduced by PKVY	3.500	2.065	Favorable
38.	PKVY improves the socio-economic status of the farmers	3.714	1.813	Favorable
16.	Only resourceful farmers can be enrolled in PKVY	3.785	1.405	Unfavorable
60.	PKVY is in line with the needs and problems of organic farmers	3.963	1.810	Favorable
23.	Organic certification is made possible through PKVY	4.000	0.833	Favorable
36.	PKVY won’t make any difference in the farming community	4.063	0.970	Unfavorable
41.	PKVY provides potential market for the organic produce	4.193	1.203	Favorable

3.2. 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 correlation test in order to find out the reliability of the half test by using SPSS software. The half-test reliability coefficient (r) was 0.638 which was significant at one per cent level of probability. Further the reliability coefficient of the whole test was computed using the Spearman-Brown Prophecy formula. The whole test reliability (rtt) was 0.778. When the purpose of the test is to compare the mean scores of two groups of narrow range a reliability coefficient of 0.50 or 0.60 would suffice. Hence, the constructed scale is reliable as the reliable coefficient (rtt) was >0.60.

3.3. 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 attitude items covered the different aspects of conservation agriculture practices. 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 3.94 and therefore the constructed attitude scale is said to be valid.

3.4. 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 conservation agriculture practices. The responses were grouped as unfavourable, moderately favourable and highly favourable based on the cumulative frequency method.

3.5. Conclusion

In conclusion, there are various methods available for construction of an attitude scale, Equal Appearing Interval method scaling technique was used in this study to measure the attitude of organic farmers towards PKVY scheme. The scale would be highly useful to study the attitude of organic farmers towards PKVY scheme.

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