

Development of a scale to measure the attitude of farmers towards Crop Insurance Scheme

ABSTRACT

A scale was developed to measure the "attitude of farmers towards Crop Insurance Scheme". Based on the review of literature and discussion with the expert's, 48 statements were enlisted. The Likert's summated rating scale was followed in the construction of scale. The relevancy rating was sent to 250 extension specialists working in various research and extension wings of ICAR like State Agricultural Universities, KVKs etc., throughout the country for critical evaluation of statements on a 4 point continuum. Out of 250 judges selected for the scale construction, 74 judges were responded in time and at earliest. Based on their judgment an aggregate of 30 statements was selected by finding the Relevancy Weightage Scores (RWS). Statements having an equal or more RWS of 0.75 and Mean Relevancy Score of 3.00 were selected for the item analysis. In item analysis, the selected statements were administered to forty farmers in the non-sample area. Finally, a total of 24 statements are selected for the study based on the 't' values (> 1.75) resulted from the item analysis and were included in the final scale. The 'r' value of the scale was found to be 0.81, which was significant at one per cent level indicating the high reliability. Hence, the scale developed was found to reliable and valid. Thus, the instrument developed to measure the attitude of farmers towards Crop Insurance Scheme and it consists of 18 positive and 6 negative attitude statements.

Keywords: Attitude, Crop Insurance Scheme, Item analysis, Reliability and Validity

1. Introduction:

Agriculture production and farm income in India are frequently affected by natural disasters such as droughts, floods (Musa & Shabu, 2019), cyclones, storms, landslides and earthquakes (Sivakumar, 2005). Disasters can cause loss of human and animal life, field crops, stored seeds, agricultural equipment/materials, and their supply systems (e.g. infrastructure) as well as associated indigenous knowledge, thus disrupting not only the immediate growing season but also future seasons (Sperling, 2008; McGuire and Sperling, 2013; Chapagain & Raizada, 2017). Susceptibility of agriculture to these disasters is compounded by the outbreak of epidemics and man-made disasters such as fire, sale of spurious seeds, fertilizers and pesticides, price fluctuations etc. All these events severely affect farmers through loss in production and farm income, and they are beyond the control of

the farmers. With the growing commercialization of agriculture, the magnitude of loss due to unfavourable eventualities is increasing. The question is how to protect farmers by minimizing such losses. For a section of the farming community, the minimum support prices for certain crops provide a measure of income stability.

In recent times, mechanisms like contract farming and future's trading have been established which are expected to provide some insurance against price fluctuations directly or indirectly. But, agricultural insurance is considered as an important mechanism to effectively address the risk to output and income resulting from various natural and manmade events (Aditya & Kishore, 2018). Agricultural Insurance is a means of protecting the agriculturist against financial losses due to uncertainties that may arise agricultural losses arising from named or all unforeseen perils beyond their control. National Agricultural Insurance Scheme (NAIS), Modified National Agricultural Insurance Scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) were the major insurance schemes implemented in India and due to the various issues of implementation, NAIS and MNAIS have been merged under the single scheme Pradhan Mantri Fasal Bima Yojana (PMFBY) and WBCIS also brought under PMFBY as restructured WBCIS in 2016. According to Thurstone (1946) defined Attitude is the "degree of positive or negative affect associated with some psychological objects like symbols, phrase, slogan, person, institution towards which people can differ concerning positive or negative effect". In the present study, attitude referred to the degree of positive or negative affect associated with farmers towards the Crop Insurance Scheme. Hence, the research was taken to develop and standardize a scale to measure the attitude of farmers towards the Crop Insurance Scheme.

2. Methodology:

The present study was carried out during 2017- 2018. Forty farmers from a non-sample area were personally interviewed. The method suggested by the Likert (1932) in developing a summated rating scale was used to construct the attitude scale. The details of the procedure followed and standardization of the scale to measure the attitude of farmers towards Crop Insurance Scheme is as follows:

2.1 Collection of items / statements

About 86 draft statements on the attitude of Crop Insurance Scheme were collected based on a review of literature, journals, thesis discussion with relevant specialists and researcher's own experience. These statements were carefully edited in the light of 14 criteria

suggested by Edword (1969). Thus, 48 statements (Table 1) were selected for further analysis.

2.2 Relevancy weight test

All the statements collected may not be relevant equally in measuring the attitude of farmers towards the Crop Insurance Scheme. Hence, these statements were subjected to scrutiny by an expert panel to determine the relevancy and screening for inclusion in the final scale. For this, the list of scrutinized 48 statements was sent to a panel of 250 experts with the request to critically evaluate each statement for its relevancy to measure the attitude of farmers towards Crop Insurance Scheme.

The experts comprised scientists of ICAR Research Stations and Institutions, Subject matter specialists in KVKs, Agricultural Extension scientists from State Agricultural Universities, Agricultural Officers of State Agricultural Department who were involved in crop insurance implantation process and Bank Officials who were involved in crop insurance online registration process throughout the country for critical evaluation. The experts were requested to give their response on a four-point continuum *viz.*, Most Relevant (MR), Relevant (R), Less Relevant (LR) and Not Relevant (NR) for appropriateness of each statement with the score of 4, 3, 2, and 1 respectively.

Out of 250 experts, only 74 responded in two months. The relevancy score of each item was ascertained by adding the scores on the rating scale for all the 74 experts' responses. From the data gathered Relevancy Percentage (RP), Relevancy Weightage (RW) and Mean Relevancy score (MRS) was worked out for all the 48 items/ statements by using the following formulae.

$$\text{Relevancy Percentage (RP)} = \frac{\text{MR} \times 4 + \text{R} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Maximum possible score (74} \times 4 = 296)} \times 100$$

$$\text{Relevancy Weightage (RW)} = \frac{\text{MR} \times 4 + \text{R} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Maximum possible score (74} \times 4 = 296)}$$

$$\text{Mean Relevancy Score (MRS)} = \frac{\text{MR} \times 4 + \text{R} \times 3 + \text{LR} \times 2 + \text{NR} \times 1}{\text{Number of judges respondent}}$$

Using these three criteria the statements were screened for their relevancy. Accordingly, statements having relevancy percentage more than relevancy weight more than

0.75 and mean relevancy score more than 3.00 were considered for the final selection of statements. By this process, out of 48 statements, 30 statements have relevancy percentage more than 75, relevancy weightage more than 0.75 and mean relevancy score more than 3.00 and were isolated in the first stage of screening, suitably modified and rewritten as per the comments of experts. Thus, finally, about 30 statements (Table 2) were selected after the relevancy test.

2.3 Item analysis

The selected 30 statements were subjected to item analysis to demarcate the items based on the extent to which they can differentiate the respondents with high altitude and low attitude towards Crop Insurance Scheme. Thus scrutinized statements representing the attitude of farmers towards Crop Insurance Scheme were administered to 40 respondents from the non-sampling area. The respondents were asked to indicate their degree of agreement or disagreement with each statement on a five-point continuum *viz.*, strongly agree, agree, undecided, disagree and strongly disagree with scores of 5, 4, 3, 2 and 1, respectively and negative statements scores were reversed.

The respondents' responses were recorded and the summated score for the total statements of each respondent is obtained. For each respondent, the maximum possible score for 30 statements was 150 and the minimum was 30. The scores of the respondents were then arranged in descending order. The 25 per cent from the highest scores (high group) and 25 per cent from the lowest scores (low group) were taken for the item analysis. These responses were subjected to item analysis for the selection of the items that constitute the final attitude scale.

The critical ratio i.e., t-value which was a measure of the extent to which a given statement differentiates between the high and low groups of respondents for each statement was calculated by using the following formula

$$t = \frac{\bar{X}_H - \bar{X}_L}{\frac{\sqrt{(\sum \bar{X}_H^2 - \frac{(\sum [\bar{X}_H])^2}{n}) \times (\sum \bar{X}_L^2 - \frac{(\sum [\bar{X}_L])^2}{n})}{n(n-1)}}$$

Where,

\bar{X}_H = The mean score on the given statement of the high group

\bar{X}_L = The mean score on the given statement of the low group

$\sum X^2_H$ = Sum of squares of the individual score on a given statement for high group

$\sum X^2_L$ = Sum of squares of the individual score on a given statement for low group

n = Number of respondents in each group

t = The extent to which a given statement differentiate between the high and low group.

After calculating the t- values for all the items of the attitude scale using the formula, the values of the statements were arranged in descending order from the highest to the lowest and 24 statements were selected from the scale whose values are highest i.e., with t- values more than 1.75, for both positive and negative statements.

2.4 Selection of Attitude Statements for final Scale

After computing "t" value for all the items, 30 statements with the highest "t" value equal to or greater than 1.75 were selected. The thumb rule of rejecting items with 't' value less than 1.75 was followed by Edwards A L. (1957). As per the thumb rule selection of items to be retained in the scale, includes the scales with highest discriminating values excluding the scales with the poor discriminating ability and questionable validity. Thus, 24 statements were retained for consideration in the final scale based on the following norms:

- i. The 't' value should be more than 1.75
- ii. The statement should present a new idea i.e., the idea not overlapping with that expressed other
- iii. The statement should be simply worded and brief.

2.5 Reliability and validity of the Attitude Scale

The scale developed was further standardized by establishing its reliability and validity. "Reliability is the accuracy or precision of measuring instrument" by Ganeshkumar and Ratnakar (2011). To know the reliability of the attitude scale Split-Half method was followed. As validity means truthfulness, which refers to "the degree to which a test measures, what it claims to measure" by Kerlinger (1973), content validity was used to measure the validity of the scale.

2.5.1 Split-Half methodology

The reliability of the scale was determined by 'Split-Half' method. The split-half method was regarded by many as the best of the methods for measuring reliability. The 24 selected attitude items were divided into two halves by the odd-even method. The two halves were administered separately to 20 farmers in a non-sample area. The scores were subjected to the product-moment correlation test to find out the reliability of the half-test. The half-test reliability coefficient (r) was 0.64, which was significant at the five per cent level of probability. Further, the reliability coefficient of the whole test was computed using the Spearman-Brown prophecy formula given below.

$$r_{1/2} = \sqrt{\frac{n(\sum XY - (\sum X)(\sum Y))}{(n\sum X^2 - (\sum X)^2)(n\sum Y^2 - (\sum Y)^2)}}$$

Where,

$\sum X$ = Sum of the scores of the odd number items

$\sum Y$ = Sum of the scores of the even numbers items

$\sum X^2$ = Sum of the squares of the odd number items

$\sum Y^2$ = Sum of the squares of the even number items

n = Number of respondents

The whole test of the scale was 0.81, which was highly significant at one per cent level indicating the high reliability of the scale.

2.5.2 Content validity of the attitude scale

The validity of the scale was established through content validity i.e., the representativeness of sampling adequacy of the content of a measuring instrument. The scale satisfies both these criteria as the clause of the universe of statements that could be made about Crop Insurance Scheme is formulated from the standards and also in consultation with experts who knew the psychological object. This ensures high content validity of attitude scale. The scale was constructed by the steps followed in the summated rating scale given by Edward A L. (1957). Therefore, it was assumed that the scores obtained by administering this scale measured nothing other than the attitude of farmers towards the Crop Insurance Scheme. While selecting attitude statements, due care is taken for obtaining a fair degree of content validity. The calculated "t" value is significant for all the finalized statements of the

score indicated that the attitude statements of the scale have discriminating values. Hence, it seems reasonable to accept the scale as a valid measure of the attitude.

2.5.3 Administration and scoring of attitude scale

The final scale consisted of 24 statements (Table 3). The responses had to be 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 attitude score on this scale ranges from a minimum of 24 to a maximum of 120. Higher the attitude score indicates the more favourable attitude of farmers towards crop insurance scheme and lesser the attitude score indicates less favourable attitude towards crop insurance scheme.

CONCLUSION

The attitude scale developed was found to be reliable and valid. The attitude scale developed was administered to forty crop insured farmers of a non-sample area, there were no complications in using the scale, hence it can be concluded that the scale developed was useful in explicitly measuring the attitude towards crop insurance scheme. Researchers can use the scale in future for measuring the attitude of farmers in similar studies.

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Author contribution

This work was carried out in collaboration between all authors. Author S. K. JAMANAL conducted the study, collected the data from farmers and applied suitable statistical tools. Authors K. V. NATIKAR and S. V. HALAKATTI are Chairman and member of advisory committee they provided proper guidance and corrected the final manuscript. All authors read and approved the final manuscript.

Table 1. Attitude of farmers towards Crop Insurance Scheme sent to the Expert for their Relevancy

SI. No.	Statements	Relevancy			
		MR	R	LR	NR
1.	I feel that crop insurance scheme is a good initiative by the Government to help farming community				
2.	In my view premium rate prescribed in the crop insurance scheme is reasonable				
3. *	Insurance agents / Bank officials / line department officials do not explain in detail about the crop insurance scheme				
4.	According to my opinion crop insurance scheme has adopted the latest technologies for crop loss estimation like mobile phones, drones, remote sensing application etc.,				
5.	In my view crop insurance scheme is a good initiative in motivating the farmers to adopt innovative technologies				
6.	Crop insurance scheme ensure minimum farm income during disaster years				
7.	I feel relaxed for having crop insurance				
8.	As per my view crop insurance pays more than what we pay for premium				
9.	I feel that crop insurance scheme encourages the farmers to take up crop diversification				
10. *	I faced difficulties during registration process of crop insurance scheme				
11. *	Crop insurance scheme should be voluntary				
12.	Crop insurance scheme serves as “guarantee” to banks in granting loans to the farmers				

13. *	Government is using this crop insurance scheme to collect money from farmers				
14. *	Availing crop insurance facility is more tedious				
15. *	I spent more time and faced difficulties in adopting crop insurance scheme				
16.	Crop insurance scheme gives financial security to famers				
17. *	I feel that the sum insured amount fixed by the Government/ Insurance agency is not adequate				
18. *	Compensation for crop insurance scheme is too less				
19. *	Insurance companies, Banks and Agricultural Departments are not making adequate publicity regarding benefits of the Crop insurance scheme				
20.	I get claim from the insurance company when the crop is damaged				
21. *	Crop insurance scheme will not give any benefit rather than it is loss of money				
22. *	Bank officers do not spare their time on “non- loanee” farmer application process				
23.	I am willing to pay the premium to insure the crop				
24. *	Insurance unit for crop loss estimation should be made at the Gram Panchayat level				
25. *	There is much delay in claiming the settlement				
26.	The coverage of “post harvest losses” in crop insurance scheme is a good initiative				
27.	Crop insurance claim settlement directly going to beneficiary bank account is a good initiative				
28. *	Major crops are not covered under crop insurance scheme				
29.	Crop insurance scheme helps to reduce the harmful consequences like distress / disappointment among farmers				
30.	Crop insurance scheme is a farmer friendly approach				
31. *	I do not have faith in the crop insurance scheme				
32.	Crop insurance scheme is farmers welfare oriented scheme				
33.	Crop insurance scheme reduces Government expenditures on relief measures during natural calamity or disasters				
34.	Rate of indemnity levels are good in crop insurance scheme				
35.	I feel insecure about the crop damage without crop insurance				
36.	Crop insurance scheme plays an important role in sharing the risks of farmers in an affordable form				
37.	Crop insurance scheme protects the farmers against the production risk				
38.	Crop insurance scheme enhance the food and livelihood security among farmers				
39. *	I have to travel long distance to contact crop insurance agent / bank / insurance company				
40.	In the event of failure of rain, i will get at least crop insurance even though i did not sow the crop				
41. *	I feel that the insurance companies need to reduce the formalities in claiming settlement				
42. *	There is a need for crop insurance service at the door step				

43. *	I feel that, the terms and conditions of the crop insurance scheme are very difficult to understand				
44. *	Crop Cutting Experiments are not properly supervised by the concerned authorities				
45.	“Samrakshane crop insurance app” helps farmers to get online information				
46. *	“Samrakshane crop insurance app” is very difficult to operate				
47. *	Crop insurance scheme may be additional burden to farmers				
48.	Crop insurance scheme encourage the farmers to take up agriculture as an occupation				

Note * Negative statement

Table 2. Weightages given by judges for measuring the attitude of farmers towards crop insurance scheme

Items generated with relevancy percentage (RP), relevancy weightage (RW) and mean relevancy scores (MS)

SI. No.	Statements	Relevancy ratings		
		RP	RW	MRS
1	I feel that crop insurance scheme is a good initiative by the Government to help farming community	93.24	0.93	3.73
2	In my view premium rate prescribed in the crop insurance scheme is reasonable	77.70	0.78	3.11
3*	Insurance agents / Bank officials / line department officials do not explain in detail about the crop insurance scheme	75.34	0.75	3.01
4	In my view crop insurance scheme is a good initiative in motivating the farmers to adopt innovative technologies	75.34	0.75	3.01
5	Crop insurance scheme ensure minimum farm income during disaster years	80.07	0.80	3.20
6*	I faced difficulties during registration process of crop insurance scheme	75.34	0.75	3.01
7*	Crop insurance scheme should be voluntary	78.04	0.78	3.12
8	Crop insurance scheme serves as “guarantee” to banks in granting loans to the farmers	75.00	0.75	3.00
9*	I feel that the sum insured amount fixed by the Government/ Insurance agency is not adequate	79.73	0.80	3.19
10*	Compensation for crop insurance scheme is too less	84.80	0.85	3.39

SI. No.	Statements	Relevancy ratings		
		RP	RW	MRS
11	Insurance companies, Banks and Agricultural Departments are not making adequate publicity regarding benefits of the Crop insurance scheme	76.01	0.76	3.04
12	I get claim from the insurance company when the crop is damaged	79.39	0.79	3.18
13	I am willing to pay the premium to insure the crop	76.35	0.76	3.05
14*	There is much delay in claiming the settlement	77.03	0.77	3.08
15	The coverage of “post harvest losses” in crop insurance scheme is a good initiative	79.73	0.80	3.19
16	Crop insurance claim settlement directly going to beneficiary bank account is a good initiative	80.41	0.80	3.22
17*	Major crops are not covered under crop insurance scheme	79.73	0.80	3.19
18	Crop insurance scheme helps to reduce the harmful consequences like distress / disappointment among farmers	82.09	0.82	3.28
19	Crop insurance scheme is a farmer friendly approach	88.85	0.89	3.55
20	Crop insurance scheme is farmers welfare oriented scheme	78.38	0.78	3.14
21	Crop insurance scheme reduces Government expenditures on relief measures during natural calamities or disasters	82.43	0.82	3.30
22	I feel insecure about the crop damage without crop insurance	80.41	0.80	3.22
23	Crop insurance scheme plays an important role in sharing the risks of farmers in an affordable form	84.46	0.84	3.38
24	Crop insurance scheme protects the farmers against the production risk	78.04	0.78	3.12
25	In the event of failure of rain, I will get at least crop insurance even though I did not sow the crop	78.72	0.79	3.15
26*	I feel that the insurance companies need to reduce the formalities in claiming settlement	79.39	0.79	3.18
27*	There is a need for crop insurance service at the door step	81.76	0.82	3.27
28*	Crop Cutting Experiments are not properly supervised by the concerned authorities	81.42	0.81	3.26
29	“Samrakshane crop insurance app” helps farmers to get online information	80.41	0.80	3.22
30	Crop insurance scheme encourages the farmers to take up agriculture as an occupation	81.76	0.82	3.27

Note *Indicates Negative statement

Table 3. Attitude of farmers towards crop insurance scheme

Items generated with t values based on item analysis

Sl. No	Statements	t-Value
1	I feel that crop insurance scheme is a good initiative by the Government to help farming community	4.61
2	In my view premium rate prescribed in the crop insurance scheme is reasonable	2.04
3	In my view crop insurance scheme is a good initiative in motivating the farmers to adopt innovative technologies	2.45
4	Crop insurance scheme ensure minimum farm income during disaster years	2.18
5*	I faced difficulties during registration process of crop insurance scheme	2.12
6*	Crop insurance scheme should be voluntary	2.86
7*	I feel that the sum insured amount fixed by the Government is not adequate	2.23
8*	Compensation for crop insurance scheme is too less	3.89
9*	Insurance companies, Banks and Agricultural Departments are not making adequate publicity regarding benefits of the Crop insurance scheme	3.78
10	I get claim from the insurance company when the crop is damaged	2.35
11	I am willing to pay the premium to insure the crop	3.57
12*	There is much delay in getting claim	2.45
13	The coverage of “post harvest losses” in crop insurance scheme is a good initiative	1.99
14	Crop insurance claim settlement directly going to beneficiary bank account is a good initiative	4.32
15*	Major crops are not covered under crop insurance scheme	2.21
16	Crop insurance scheme helps to reduce the harmful consequences like distress / disappointment among farmers	2.09
17	Crop insurance scheme is a farmer friendly approach	4.15
18	Crop insurance scheme is farmers welfare oriented scheme	3.89
19	Crop insurance scheme reduces Government expenditures on relief measures during natural calamities or disasters	2.31
20	Crop insurance scheme plays an important role in sharing the risks of farmers in an affordable form	1.93
21	Crop insurance scheme protects the farmers against the production risk	1.89
22*	I feel that the insurance companies need to reduce the formalities in claiming settlement	3.67
23*	Crop Cutting Experiments are not properly supervised by the concerned authorities	2.89
24	“Samrakshane crop insurance app” helps farmers to get online information	1.78

Note * Indicates Negative statement