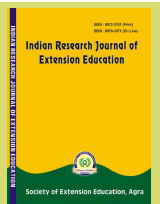


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Scale on Attitude of Young Farmers Towards Climate Smart Agricultural Interventions

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ABSTRACT

Attitude is the prime cause for the growth of an individual and will have great impact on the way we think, the way we perceive and the way we do the things. It is the determining factor for the success or failure of any vibrant endeavor. Climate Smart Agriculture (CSA) has been emerged to address the challenges in the agriculture sector caused by climate-induced disasters and stresses. It is a strategic approach that aims to sustainably improve agricultural productivity and enhance food security, increase farmers' resilience and adaptation to climate change, and reduce and/or remove GHGs emission where possible (FAO, 2013). In this study, attitude of respondent young farmers towards CSA interventions was studied. Due to non-availability of appropriate scale to measure the attitude of young farmers towards CSA interventions, it was thought necessary to construct a scale for the purpose. Hence to understand the feelings of respondent young farmers towards CSA interventions, an attitude scale was developed. Likert's scaling technique (1932) was found appropriate due to large number of items. A schedule of statements was sent to 80 judges to found its appropriateness by assigning the score on each item. Based on the 't' value, 25 items were finally selected to constitute the scale to measure the attitude of respondent young farmers towards CSA interventions. Reliability of the scale was found to be 0.8863. The validity of the scale was tested by experts' judgments. The reliability and validity of the scale indicate its consistency and precision of the results.

Key words: *Attitude scale; Young farmers; CSA interventions; Agricultural.*

Today, India is the second largest country in the world in terms of agricultural output. About 180 million hectare land and 60.5 per cent of total land area is used for agriculture. In total, the sector contributes about 14 per cent of the total GDP and employs more than 50 per cent of the total workforce. Climate Smart Agriculture (CSA) defined as an approach for transforming and reorienting agricultural development under the new realities of climate change (Lipper *et al.* 2014). CSA helps and guide actions needed to transform and reorient agricultural systems to effectively support the development and ensure food security in a changing climate. India has already started development and inclusion of climate change adaptation polices in various sectors. The National Action Plan

on Climate Change (NAPCC) of India identifies eight core missions that promote various climate smart interventions in agriculture and allied sectors. Several literatures reported that attitude of an individual plays a significant role in the adoption or rejection of CSA interventions. In this regard, an attempt was carried out to construct a scale to measure the attitude of respondent young farmers towards CSA interventions.

METHODOLOGY

Thurstone (1946) defined attitude as the degree of positive or negative affect associated with some psychological object. Among the available techniques for constructing a scale, the *Likert's scaling technique (1932)* was found appropriate due to large number of items.

Selection of indicators : The available literature was reviewed and from them 12 indicators related to CSA interventions were resorted. A list of indicators was circulated among 60 extensionists and their opinions were obtained on 10 point continuum to know its appropriateness for the study. The indicator wise frequencies were converted in master sheet. For each indicator weighted mean and standard error were calculated. The obtained values were arranged in ascending order. Out of 12 indicators, those having less than 70 per cent value were omitted. In this way 09 indicators were finalized for the study.

Item Collection : The items making up an attitude scale are known as statements. A statement may be defined as anything that is said about a psychological object (Edwards, A. L. 1957). Initially, 110 items were made according to the selected indicators from the relevant literatures and converted them in context to the present requirement. The statements, thus selected, were edited on the basis of the criteria suggested by Edward and Kilpatrick (1948) to eliminate the ambiguity.

Item analysis : The five point continuum criterion was used to judge each statement on the degree of strongly agree to strongly disagree. A schedule was prepared with 90 items and sent online through 'Google forms' as well as through personal contacts to the personnel working as extension educationist, sociologist and psychologist from various universities of India for judging the relevancy of items. Out of 145, 100 judges were responded. The investigator was found that some of the judges have responded very carelessly, misunderstood the directions and not be aware about the concept under present study. Hence, 20 schedules were eliminated. Lastly, 80 schedules were kept for the construction of attitude scale.

Selection of item : A five point rating method was followed as; 5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree. The responses of 80 judges on 90 items were transferred into the master sheet. As basis for rejecting of statements, the method of summated ratings was used. Then considered the frequency distribution of scores based upon the responses to all statements.

The 25 per cent of them with highest total scores (20 items) and 25 per cent lowest total scores (20 items) were considered. These two groups provided criterion groups in terms of which to evaluate the individual statements. The paired 't' test was applied to measure the extent to which a given statement differentiates between

the high and low groups. The 't' value for each statement was calculated by using the formula.

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

Where,

H= High group; L= Low group; n = No. of respondents in each group

According to summated ratings method, a set of 25 statements was desired that were differentiating between the high and low groups. After computing the 't' value for all the items, the statements having 't' value equal to or greater than 2.02 were selected (Table 1). The first 25 statements with the largest value of 't' were selected for the final scale. Based on the 't' value, 25 statements numbering 41, 58, 69, 78, 16, 24, 34, 17, 65, 72, 40, 52, 43, 18, 04, 50, 31, 01, 25, 64, 23, 77, 49, 27, and 38 of schedule were finally selected to measure the attitude of respondent young farmers towards Climate Smart Agricultural interventions. *Reliability of the scale* : Reliability is defined as the probability that a product, system, or service will perform its intended function adequately for a specified period of time, or will operate in a defined environment without failure. The constructed scale on attitude for measurement was tested for its reliability by using the split half method. It was introduced to 20 respondents in the non-sample area. The coefficient of reliability between these two sets of score was calculated by Rulon's formula (Guilford 1954). The coefficient of reliability between two sets of score was found to be 0.8863 which was significant at 1 percent level. The correction factor is calculated by using Spearman Brown formula which was 0.9397. Thus, scale developed for the purpose was found highly reliable.

Validity of the scale : The validity of a test depends upon fidelity with which it measures what it is expected to measure (Kerlinger, 1967). The content validity of the scale was tested. It is the delegate or sampling amplexness of the substance, the content, the issue and the subjects of an estimating instrument. This technique was utilized in the current scale for deciding the content validity of the scale. As the substance of the disposition was overall secured the topic under the examination through literatures and expert opinions, it was expected that current scale has fulfilled the content validity.

Administering the scale : The selected 25 statements for the final format of the attitude scale were randomly arranged to avoid the biases, which might contribute

Table.1 Selected attitude statements for the present study

Sr. No	Statements	't' value
S41	Advance weather information helps in reducing the risk in the cultivation of crops (+)	13.1
S58	Seed banks ensure farmers' access to climate ready cultivars (+)	12.4
S69	Crop insurance increases the farmers' attitude to take risk on adoption of innovative agricultural technology (+)	12.6
S78	Integrated Pest Management increases the cost of cultivation (-)	12.0
S16	Conversion of crop residues into bioenergy reduces the consumption of fuel (+)	11.5
S24	Crop rotation helps in increased nutrient availability in the soil (+)	11.3
S34	Incorporation of crop residues in soil adversely affects the soil characteristics (-)	11.2
S17	Use of solar energy in farm operations reduces the adverse environmental effects (+)	11.1
S65	Practice of multiple cropping creates risk for the farmers (-)	10.7
S72	Foliar application of pesticides increases pollutants in the air (+)	10.6
S40	Carbon smart farming helps in combating climate change (+)	10.5
S52	Diversification of farm enterprise ensures income security (+)	10.3
S43	Weather based information is hard to get from Agro-Advisory (-)	10.2
S18	Production of biofuel is a complex process (-)	10.1
S04	Installation of drip irrigation system is costly (-)	9.78
S50	Weather based mobile app helps to get information about weather forecasting (+)	9.75
S31	Biogas plant reduces methane emission (+)	9.55
S01	Drip irrigation system minimizes water losses (+)	9.47
S25	Mulching increases the cost of cultivation (-)	8.88
S64	Multiple cropping helps in additional income generation (+)	8.32
S23	Cultivation of legumes improve the availability of nitrogen in the soil (+)	8.23
S77	Soil solarization increases soil-borne diseases (-)	8.19
S49	Past experiences enable us to predict the climate change (+)	8.11
S27	Location specific application of nutrients is costly (-)	8.04
S38	Integrated Pest Management helps in judicious use of pesticides (+)	7.93

to the low reliability and detraction from validity of the scale. Out of them, 9 statements were showing the unfavourable attitude and 16 statements were of favourable attitude. *Likert (1932)* suggested five point continuum to get responses from respondents. They 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 unfavourable statements.

CONCLUSION

It is applicable to measure the attitude of respondent young farmers towards CSA interventions. It helps to understand the positive or negative feelings of young farmers towards CSA interventions.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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