Scale to Measure Attitude of Tribal Rice Farmers towards the Sustainability of Rice Farming

ABSTRACT

The present article summarizes the development of a scale to measure the attitude of tribal rice farmers towards the sustainability of rice farming in Wayanad district of Kerala. The scale was developed using Likert's summated ratings method. The study describes the development of scale in a stepwise manner including collection of statements, item analysis, editing, validity, reliability and final selection. The calculated value of reliability coefficient for whole test was 0.806, which was quite reliable. The thumb rule of rejecting item with't-value' less than 1.89 at 0.05 level of significance was followed. As per the thumb rule total of 25 statements were selected giving the due consideration to include both positive and negative statements in more or less equal proportion. The respondents were grouped into three categories like, less favourable attitude, favourable attitude and highly favourable attitude on the basis of their attitude towards the sustainability of rice farming by using mean and standard deviation. It is contended that the scale would prove useful in measuring the attitude of tribal rice farmers towards the sustainability of rice farming.

***Keywords**: Attitude scale; Tribal rice farmers; Sustainability of rice farming; Reliability;*

1. INTRODUCTION

Agriculture plays a central role in people's lives and in shaping india's economy. The green revolution probably remains the most important phase of indian agriculture in the last century. It ensured india's self-sufficiency in food grains and touched most of india's farmers. But its long-term effects are now visibly evident. These include soil degradation, groundwater depletion, contamination of water bodies and reduction of biodiversity. Crop yields cannot be sustained without increased use of fertilizers. Fragmented land tenure and associated low farm incomes push many smallholder farmers into non-agricultural economic activities. In order to face these crises in agriculture, efforts should be made to link economy and ecology with some social aspects. These efforts indicate an emphasis on sustainable agriculture, which is a must to overcome stagnation in agriculture. The primary goals of sustainable agriculture as providing a more profitable farm income, promoting environmental stewardship, including: protecting and improving soil quality, reducing dependence on non-renewable resources such as fuel, synthetic fertilizers and pesticides, and minimizing adverse impact on safety, wildlife, water quality and other environmental resources promoting stable, prosperous farm families and communities (Department of Agriculture and Cooperation, 2010). According to food and agriculture organization (2015), to be sustainable, agriculture must meet the needs of present and future generations for its

products and services, while ensuring profitability, environmental health and social and economic equity.

In Kerala, Wayanad district which has the highest tribal congregation coupled with preponderance of non tribes and agriculture is the most primitive occupation of the tribal people and their cultivation has mainly focused on rice. They grow native varieties of rice and practice the traditional method of cultivation for centuries. But the introduction of new varieties of rice and the changing method of cultivation has a great effect on the social and economic life of the tribe, both positive and negative. Most of the original varieties of rice possessed by the tribal communities have become extinct and the remaining few are on the verge of extinction. Thus, there is a strong need to adapt agricultural practices in order to increase the production of rice in a manner that is economically viable and environmentally sustainable. For these reasons, a study on attitude towards sustainable rice farming by tribal farmers was relevant and important in the present socio-economic milieu of Wayanad district.

Attitude is a state of readiness or a tendency to react in a certain manner which imbibed through experiences and have a strong impact on the behaviour exerted by an individual. Attitude plays an important role in adoption of recommended practices by farmers leading to higher productivity and profitability. A farmer's decision to adopt environment friendly agricultural practices depends upon his favourable attitude. Attitude measurement will help researchers in providing an adequate explanation on farmer's perception towards sustainable agricultural practices and can be used on developing strategies and policies related to sustainable issues.

Attitude scale has been proved as useful tool to measure the attitude of large number of individuals towards specific areas. Such instrument stimulates people to express their attitude. Further, it also assists the individual in exercising their decision-making skills efficiently (Baron and Byrne, 1991). Considering this, the present study was planned to construct the scale to measure the attitude of tribal rice farmers in Wayanad district of Kerala towards the sustainability of rice farming.

As attitude of farmers determine their adoption behaviour in terms of following the improved practices, a research study was conducted during 2018-2021 to develop a scale based on Likert"s technique.

2. METHODOLOGY

The attitude in present study means negative or positive reaction of tribal rice farmers towards the sustainability of rice farming. Considering the capacity of summated rating technique to measure the broadness, value and intensity of the study area, the researcher has selected the methods suggested by Likert (1932) and used by Bard and Barry (2000) and by Roslan *et al.,* (2012) for scale construction and for ascertaining the response of the scale.

It is a widely used scale in many field of discipline most particularly in the social science research like in education and psychology. It is a scaling method in which a statement can be responded positively or negatively (Pimentel, 2019). This technique is moderately simple, time-saving and offers opportunities to select statements based on their discriminating power. Following steps were followed for construction and standardization of the desired attitude scale:

2.1 Collection of statements

The items of attitude were called statements. At initial stage of developing scale, one hundred and fifteen attitudinal statements about sustainability of rice farming were collected from relevant literature and discussed with scientists, experts/concern departmental heads. The statements selected were then edited according to the 14 criteria laid down by Edward (1957). In all, forty-five statements were found to be non-ambiguous and non-factual and hence, were selected.

2.2 Item analysis

Selected forty-five statements were given to a group of thirty-two rice farmers from non-sampling area and were asked to respond to each statement in terms of their agreement or disagreement on a five-point continuum from 'strongly agree' to 'strongly disagree'. The responses were obtained by summing up the score for each respondent for all items. These statements strongly agree, agree undecided, disagree and strongly disagree; responses were given weightage of 5, 4, 3, 2, and 1, respectively. For a negative statement the scoring procedure was reversed. Frequency distribution of the scores of respondents was then prepared. The subjects were then arranged in the array basing only the score obtained by them. For the purpose of item analysis 25 per cent (i.e., 8 judges each) of the subjects with highest score and 25 per cent of the subject with the lowest score were selected. These two groups provided the criterion groups in terms of which item analysis was conducted. The responses of the high and low groups of each statement were then analysed by working out 't-values' with the help of the following formula (Edward, 1957).

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

$\bar{X}_H$ = Mean of the score of an item for the high group

$\bar{X}_L$ = Mean of the score of an item for the low group

X_H = Sum of scores of all subjects on an item for the high group

X_L = Sum of scores of all subjects on an item for the low group

n = Number of subjects in a group

The thumb rule of rejecting item with't-value' less than 1.89 at 0.05 level of significance was followed. As per the thumb rule total of 25 statements were selected giving the due consideration to include both positive and negative statements in more or less equal proportion (Table 1).

Table 1. Attitude Scale developed for measuring the attitude of tribal rice farmers towards the sustainability of rice farming.

Sl. No	Statements	t value

1.	It is important to use healthy seeds of locally adapted varieties to get a good potential yield and there by maintenance of genetic diversity (+)	5.58
2	Minimum tillage/ ploughing conserves the chemical and physical qualities of the soil (+)	2.96
3	Application/ addition of organic fertilizers, green manure crops and mulches can increase soil fertility and maintain soil humidity (+)	9.96
4	Crop rotation and diversification can reduce pests and diseases (+)	4.48
5	Soil tests should be conducted before application of fertilizers (+)	5.53
6	Soil and water are basic factors of production and should be exploited for greater production (-)	4.77
7	Rice yield can be increased only by increased use of chemical fertilizers (-)	4.28
8	Biological control is environmentally safe to control and reduce damage of farm pests and diseases (+)	2.47
9	Burning the field after harvesting is very useful to kill diseases and microbes (-)	3.96
10	Encouragement of natural pest enemies in the rice fields helps to keeps the pests of rice at control (+)	9.96
11	Agrochemicals are not toxic to fish and other organisms in water bodies (-)	2.57
12	Large quantity of inputs can be used in rice farming as long as it is profitable (-)	5.38
13	Farm traditions, culture and indigenous knowledge are of little use in sustainable rice farming (-)	3.85
14	To prevent flooding and water logging, conservation of rice fields has to be strictly enforced (+)	3.58
15	Natural resources must be protected for next generations (+)	3.81
16	Participating in farmer groups can improve farmers' knowledge and experience (+)	3.58
17	Forest destruction has no effect on degradation of soil and water resources (-)	2.53
18	Efficient use of water and soil conservation practices will not ultimately lead to sustainable yields of crops (-)	2.47
19	Adoption of sustainable farming practices is a costly affair(-)	2.50
20	People who have higher social status adopt more sustainable farming technologies than the people who have low social status(-)	2.29
21	Agricultural scientists and policy makers should expand efforts to develop innovations to increase production through sustainable farming (+)	4.00
22	Farm labour should be replaced whenever possible by more efficient machines (+)	4.96
23	It is better to practice specialized farming rather than diversification of	3.89

	farming system (-)	
24	The primary goal of farmers should be to increase quantity rather than quality of the products produced in their farm (-)	3.78
25	Efforts at community level are necessary for restoring the lost biodiversity of rice fields (+)	2.36

2.3 Validity of the statements

A test is said to have validity when, it appears to measure whatever the researcher had in mind and what he thought to be measuring (Garrett, 1967). According to Kerlinger (1976), the content validity is representativeness of sampling adequacy, of the content, the substance, the matter and the topics of measuring instrument. The validity of the scale was examined for content validity by determining how well the content of the scale represented the domain subject matter under study (Chovatia *et al.,* 2017).

While selecting attitude statement due care was taken in obtaining a fair degree of content validity of the calculated 't-values' being significant for all the 25 statements of the scale indicated that the statements of the scale had discriminating values.

2.4 Reliability of the scale

According to Ray and Mondal (1999), reliability refers to the precision or accuracy of measurement or score. Reliability was carried out to know the consistency, stability and accuracy of the scale.

The reliability of the scale was tested by using 'split half method.' The odd number and even number statements were separated for making two halves. The agreement between two halves was determined by calculating correlation co-efficient using Spearman-Brown formula. The calculated value of reliability coefficient for whole test was 0.806, which was quite reliable. Therefore, it is concluded that the scale was reliable.

2.5 Administration of the scale

The final attitude scale was administrated to the farmers and asked to express their reactions on five-point continuum viz., strongly agree, agree, undecided, disagree and strongly disagree with the scores of 5, 4, 3, 2 and 1 respectively. The scoring for negative statements was just reversed. The total attitude score for each respondent was obtained by adding the weights of his responses made to individual scale item. The respondents were grouped into three categories like, less favourable attitude, favourable attitude and highly favourable attitude on the basis of their attitude towards the sustainability of rice farming by using mean and standard deviation.

3. RESULTS AND DISCUSSION

The statements with 't' values of 1.89 and above are considered for final inclusion to the scale. Thus, on the scale 45 statements, 25 statements were finally selected to constitute scale to measure the attitude of tribal rice farmers towards the sustainability of rice farming.

The reliability coefficient for the whole test is computed using the Spearman- Brown prophecy formula and it is found that the whole test reliability 0.806 which was highly significant.

4. CONCLUSION

The scale developed will be of use to assess the attitude of tribal rice farmers towards the sustainability of rice farming to frame various developmental programmes. Further, it could also be used to sketch new methodologies to impart the farmers about sustainable rice production. Researchers can use the scale in future for measuring the attitude of farmers in similar studies.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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