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A CASE STUDY :

A scale to measure the attitude of farmers towards shifting cultivation

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SUMMARY : Shifting cultivation, also known as *Jhum cultivation* is the traditional slash-and-burn cultivation in hilly areas of northeast India. This type of cultivation is age old and practiced from generation to generation. This practice is considered as a hazardous practice that effects the environment. It is often considered as the main causes of forest fires, flash flood and soil erosion resulting in reduced and degraded primary land resource. The negative impact of such practice has triggered serious alarm to implement effective strategies. The only possible means to sustain the environment could be organic farming, considering the minimal usage of chemicals by the people of the region by nature. However, it is not easy to eliminate this practice since it is linked to culture and socio-economic conditions (Debral, 2002). Though several strategies and approaches have been followed to change the mindset of the farmers to shift from Jhum cultivation to a more sustainable form of cultivation, there seems to be not much improvement. Therefore, it was of interest to find out the attitude of the farmers towards shifting cultivation so that more effective strategies can be developed by decision makers, policy planners and extension functionaries.

KEY WORDS :
Shifting cultivation, Organic farming, Sustainable agriculture

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BACKGROUND AND OBJECTIVES

The current concern on climate change and its effects on the agricultural sphere has been a major area of discussion by experts, scientists, decision makers and policy makers. The North Eastern Hill Region in India and its occupants have been practising shifting cultivation, also known as "*Jhuming*" since time immemorial.

Jhuming is the most primitive and destructive method of cultivation-where the villagers slash down the forest, leave for drying under the sun for 3-4 months and burn to clear all the dry leaves, trunk, debris etc. After harvest, the jhum land is left uncultivated and the farmers shift to another virgin forest area for the next jhuming practices. This traditional practice has long been a normal and regular activity for the people of this region.

In recent years, the negative impact of shicting cultivation has become a global concern due to its effect on the environment. Efforts have been put in to convert to a susatainable form of agriculture through organic farming practices. In spite of several

strageties and approaches that has been developed and applied over the years, there seem to be minimal improvement, which is a worrying fact. Therfore, it was of interest to study the attitude of the farmers towards shifting to understand the reasons why it is difficult for them to adopt organic farming and other sustainable agriculture farming practices. Since there was no scale available, it was comtemplated to develop and standardize a scale for measuring the attitude of farmers towards shifting cultivation.

RESOURCES AND METHODS

Attitude is the degree of positive or negative effect associated with some psychological object. According to Thurstone, "psychological object" means any symbol, phrase, slogan, idea, person and institution towards which people can differ with respect to positive or negative affect. In this study, attitude was operationalized as the degree of positive or negative feeling of the farmers towards shifting cultivation. There was no scale available to measure attitude of farmers towards shifting cultivation; therefore, an attitude scale was developed. The method of summated rating suggested by Likert (1932) was followed in the development of scale. The following points were considered for measuring the attitude of farmers towards shifting cultivation

Collection and editing of statements:

100 statements, expressing the attitude of farmers towards farmers towards shifting cultivation havs been collected from available literature, in consultation with the specialists in the field of extension and they were edited on the basis of criteria suggested by Thurstone (1946); Likert (1932) and Edward (1957). Out of 100 statements, 40 statements were retained after editing. These statements were found to be non-ambiguous and non-factual.

Relevancy test:

It was possible that all the statements collected may not be relevant equally in measuring the attitude of farmers towards towards shifting cultivation. Hence, these statements were subjected to scrutiny by an expert panel of judges to determine the relevancy and screening for inclusion in the final scale. For this, the entire fourty statements list was sent to panel of judges. Judges comprised experts in the field of Extension Education, Agronomy, Soil Science, Horticulture, and Economics from Assam Agricultural University, Jorhat, Assam; School of Agricultural Science and Rural Development, Medziphema, Nagaland and Center for Post Graduate Studies, Central Agriculture University, Umiam, Meghalaya. The statements were sent to 40 Judges with request to critically evaluate each statement for its relevancy to measure attitude of farmers towards shifting cultivation. The judges were requested to give their response on a three point continuum *viz.*, highly relevant, relevant, irrelevant with scores 3, 2 and 1, respectively.

Out of 40 judges only 20 responded in a time span of one month. The relevancy score of each item was ascertained by adding the scores on rating scale for all the 30 judges' responses. From this data relevancy percentage, relevancy weightage and mean relevancy scores were worked out for all the statements by using the following formulae.

Relevancy percentage:

Relevancy percentage was worked out by summing up the scores of highly relevant, relevant and irrelevant categories, which were converted into percentage.

Relevancy weightage (R.W.):

Relevancy weightage was obtained by the following formula:

$$\mathbf{RW} = \frac{\mathbf{HR} + \mathbf{RR} + \mathbf{IR}}{\mathbf{MPS}}$$

Mean relevancy score (M.R.S.):

M.R.S. was obtained by the following formula.

$$\mathbf{MRS} = \frac{\mathbf{HR} + \mathbf{RR} + \mathbf{IR}}{\mathbf{N}}$$

HR = Highly relevant response
RR = Relevant response
IR = Irrelevant response
MPS = Maximum possible score (40×3 =120).
N = Number of judges (30).

Using these three criteria the statements were screened for their relevancy. Accordingly, statements having relevancy % >78, relevancy weightage >0.60 and mean relevancy score > 1.9 were considered for final selection of statements. By this process, 27 statements were isolated in the first stage, which were suitably modified and rewritten as per the comments of judges.

Calculation of 't' value (Item analysis):

These 27 statements were subjected to item analysis to delineate the items based on the extent to which they can differentiate the respondent with high attitude than the respondent with low attitude towards shifting cultivation. For this 60 farmers were selected from non sample area. The respondents were asked to indicate their degree of agreement or disagreement with each statement on the five-point continuum ranging from "strongly agree" to "strongly disagree". The scoring pattern adopted was 5 to 1, in which, 5 weighs to strongly agree response, 4 to agree response, 3 to undecided response, 2 to disagree response and 1 to strongly disagree response for positive statement and for negative statement, the scoring pattern was reversed.

Based upon the total scores, the respondents were arranged in descending order. The top 25 per cent of the respondents with their total scores were considered as the high group and the bottom 25 per cent as the low group, so as these two groups provide criterion groups in terms of evaluating the individual statements as suggested by Edwards (1957). Thus out of 60 farmers to whom the items were administered for the item analysis, 15 farmers with lowest, 15 with highest scores were used as criterion groups to evaluate individual items.

The critical ratio, that is the 't' value which is a measure of the extent to which a given statement differentiates between the high and low groups of the respondents for each statements was calculated by using the formula suggested by Edward (1957).

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

where,

$$\Sigma (X_H - \bar{X}_H) = \frac{\Sigma X_H^2 - (\Sigma X_H)^2}{n}$$

$$\Sigma (X_L - \bar{X}_L) = \frac{\Sigma X_L^2 - (\Sigma X_L)^2}{n}$$

X_H = The mean score on given statement of the high group

X_L = The mean score on given statement of the low group

ΣX_H^2 = Sum of squares of the individual score on a given statement for high group

ΣX_L^2 = Sum of squares of the individual score on a given statement for low group

ΣX_H = Summation of scores on given statement for high group

ΣX_L = Summation of scores on given statement for low group

n = Number of respondents in each group

Σ = Summation

Selection of attitude statements for final scale:

After computing the t' value for all the items, 20 statements with highest 't' value equal to or greater than 1.75 were finally selected and included in the attitude scale.

Standardization of the scale:

The validity and reliability was ascertained for standardization of the scale. Reliability was measured by test-retest method.

Reliability of the scale:

Test-retest method :

The final set of the 20 statements, which represent the attitude towards shifting cultivation, was administered on five-point continuum to a fresh group of 40 farmers, which were not included in the actual sample. After a period of 15 days the scale was again administered to the same respondents and thus two sets of scores were obtained. The correlation co-efficient for the both the sets were worked out. The 'r' value (0.78) was significant at 0.01 level of probability indicating the attitude scale was highly suitable for administration to the farmers as the scale was stable and dependable in its measurement.

Validity of the scale:

Content validation:

The content validity of the scale was tested. The content validity is the representative or sampling adequacy of the content, the substance, the matter and the topics of a measuring instrument. This method was used in the present scale to determine the content validity of the scale. As the content of the attitude was thoroughly covered the entire universe of shifting cultivation through literature and expert opinion, it was assumed that present scale satisfied the content validity. As the scale value difference for almost all the statements included had a very high discriminating value, it seemed reasonable to

Table 1 : Final attitude scale comprising 20 statements

Sr. No.	Statements	SA	A	UD	DA	SDA
1.	Recycling of nutrients cannot be achieved by shifting cultivation practices					
2.	I will have problems in input resources, if I convert from shifting cultivation					
3.	I would like to leave shifting cultivation even if price premiums are not available					
4.	Shifting cultivation provides great opportunity for a farmer to produce diversified products.					
5.	Shifting cultivation maintains the soil fertility					
6.	I am tired of shifting cultivation and would like to go for more integrated and systematic farming					
7.	It is difficult to leave shifting cultivation as it is inbuilt in our tradition.					
8.	Shifting cultivation is of great benefit to the farmers					
9.	People should be made aware about the environmental hazards of shifting cultivation.					
10.	Shifting cultivation has been practiced for generations, so I will continue it.					
11.	Shifting cultivation hinders sustainable agriculture.					
12.	I believe shifting cultivation more as a way of life than as an economic activity					
13.	Shifting cultivation is less expensive and I prefer it over the other system of farming.					
14.	Changing from shifting cultivation is an exciting new challenge.					
15.	Shifting cultivation is effective in controlling weeds and disease causing organisms.					
16.	If I leave shifting cultivation, it will make a difference to the environment.					
17.	Shifting cultivation is simple and easy to practice					
18.	Shifting cultivation involves more labor and time					
19.	Shifting cultivation causes harm to the environment					
20.	I am totally against shifting cultivation					

SA-Strongly Agree A-Agree UD-Undecided DA-Disagree SDA- Strongly disagree

accept the scale as a valid measure of the attitude. Thus, this ensures a fair degree of content validity.

OBSERVATIONS AND ANALYSIS

The final scale consists of 20 statements. 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, and1 for positive statements and *vice-versa* for negative statements. The attitude score of each respondent can be calculated by summing the scores obtained by him/her on all the items. The attitude score on this scale ranges from 20 to 100. The higher score indicates that respondent had more favorable attitude towards shifting cultivation and *vice-versa*.

Conclusion :

The scale had been tested reliable and valid and found precise and consistent for measuring the attitude of farmers towards shifting cultivation.

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