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A Scale to Measure Farmers' Attitude Towards Sprinkler Irrigation System

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ABSTRACT

A 20 item 'Scale Product Method' type scale has been constructed and standardized to measure the attitude of farmers towards Sprinkler Irrigation System. The coefficient of reliability was 0.833.

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INTRODUCTION

Sprinkler Irrigation System (SIS) is one of the best method which can counter many of the problems faced by conventional method of flood irrigation. Government of India and some State Governments have taken efforts to popularise this new method and are also supporting it by providing capital subsidy to farmers. However, its success or failure depends largly upon farmer's attitude towards it, that is, what farmers think and feel about SIS.

As the SIS is a very new method of irrigation, there is hardly any study available on attitude of farmers towards this irrigation system. Hence, it was felt necessary to develop a scale to measure the attitude of farmers towards SIS which could be used by researchers and extension personnel as well.

MATERIALS AND METHODS

Construction of Attitude Scale

In the present study, an attempt has been made to develop a scale which can scientifically measure farmers' attitude towards SIS. Among the techniques available for construction of scales, the Thurston's Equal Appearing Interval Technique (1928) and the Likert's summated Rating Technique (1932) are quite well known. But both the methods suffer from limitations the first one is getting discriminating response and second one in selection of items. Thus, the technique chosen to construct the attitude scale was of the "Scale Product Method" which combines the Thortone's technique of equal appearing interval scale for selection of items and Likert's technique of summated rating for ascertaining the response on the scale as proposed by Eysenck and Crown (1949).

Steps Involved in Construction of Attitude Scale

(a) Item Collection

In initial stage of developing the scale, 52 attitudinal statements about SIS were collected from relevant literature, experts in the field and extension workers. The statements, thus, selected were edited on the basis of the criteria shown by Edward (1957).

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(b) Judge's Rating of Attitudinal Statements

In order to judge the degree of 'Unfavourableness-favourableness of each statement on the seven point equal appearing interval continuum a panel of 100 judges was selected. The judges selected for this study comprised of irrigation specialists and Professors from Agricultural Engineering and Technology College, GAU, Junagadh, Professors of the Department of Extension Education of all four Agricultural Colleges of GAU, and other persons with considerable experience in SIS. The letter of instructions was sent alongwith statements. Out of thses hundred judges forty five judges replied, and were considered for the analysis.

(c) Determination of scale and Q values

The seven points of the rating scale were assigned scores ranging from 1 (for most unfavourable) to 7 (for most favourable). Then based on the judgement, the scale i.e. median and Q value for each of 52 statements were calculated. The following formula was employed to calculate the scale and Q values :

$$S = L + \frac{(0.50 - pb)}{pw} \times i$$

Where,

S = The median or scale value of the statement.

L = The lower limit of the interval in which the median falls.

pb = The sum of the proportions below the interval in which the medin falls.

Pw = the proportion within the interval in which the median falls.

i = the width of the interval and is assumed to be equal to 1.00.

The inter-quartile range $Q=Q_3-Q_1$ for each statement was also worked out for determination of ambiguity involved in the statement.

RESULTS AND DISCUSSION

(a) Final Statements for Attitude Scale

When there was a good agreement among the judges in judging the degree of favourableness or unfavourableness of a statement, Q was small compared to the value obtained when there was a relatively little agreement among the judges. Only those items were selected whose median (Scale) values were greater, than Q-values. However, when a few items had the same scale values, items having lowest Q values were selected. Based on the median and Q values 20 statements were finally selected to constitute the attitude scale.

(b) Method of Scoring

The selected 20 statements for the final format of the attitude scale were randomly arranged to avoid response biases which might contribute to low reliability and deteraction from the validity of the scale. Against each of 20 statements, there were five columns representing a five-point continuum of agreement and disagreement to the statements as followed by Likert (1932) in his summated rating technique of attitude measurement. The points on the continuum were strongly agree, undecide agree. disagree and strongly disagree with weight of 5, 4, 3, 2 and 1 respectively for a favourable statement; and with weight 1, 2, 3, 4 and 5 respectively for an unfavourable statement.

The weights of Likert's technique and the scale values of Thurstone's technique were combined in form of a product and the total score for an individual was the sum of the product. The final format of the scale is presented below :

Sr. No.	Statement	SA	A	U	DA	SD
1.	Crop matured early in sprinkler irrigation (3.9)					
2.	Field preparation in next season becomes difficult in sprinkler irrigation plot (4.9)					
3.	Dealers of sprinkler irrigation set provide good maintenance service (4.4)					
4.	Sprinkler irrigation adversely affects the soil fertility (3.7)					
5.	Weed infestation is less in sprinkler irrigation (5.7)					
6.	Sprinkler irrigation reduces the possibility of pests diseases in the crop (4.8)					
7.	The performance of interculturing operations is inconvenience in sprinkler irrigation (4.5)					
8.	Short duration training will increase the efficiency for operation of sprinkler irrigation system (6.3)					
9.	More quntity of fertilizer is required in sprinkler irrigation plot (5.6)					
10.	Sprinkler irrigation prevents frost damage to crop (5.0)					
11.	Sprinkler irrigation facilitates high seed germination (5.8)					
12.	Quality of water should be clean for sprinkler irrigation system compared to traditional system (6.0)					
13.	Chemical fertilizer gives better results with sprinkler irrigation (5.9)					
14.	Loss of water is high in sprinkler irrigation during summer season (5.5)					
15.	Soil moisture can be maintained at optimum level by sprinkler irrigation (6.1)					
16.	Wind velocity reduces the efficiency of sprinkler irrigation (6.4)					
17.	Sprinkler irrigation is benedictory to farmers (6.5)					
18.	Sprinkler irrigation system restricts the farm operation through farm machinery (4.6)					
19.	I don't prefer sprinkler irrigation system at my farm (6.7)					
20.	Government favours the sprinkler irrigation system (6.6)					

SA = Strongly agree
A = Agree
U = Undecided
DA = Disagree
SD = Strongly disagree

Reliability of the Sacle

The split-Half-Technique was used to measure the reliability of the scale. The 20 statements were divided into two equal halves with 10, odd-numbered in one half and the 10 even-numbered statement in the other. These were administered to 20 respondents. Having obtained the two scores for each of the 20 respondents, co-efficient of reliability between the two sets of scores was calculated which was 0.833.

Reliability co-efficient was calculated by Rulon's formula (Guilford, 1954):

$$r_{tt} = \frac{1 - 6^2d}{6^2t}$$

Where

r_{tt} = Coefficient of reliability

d = Difference between two half score of respondents

6^2 d = Variance of those differenc s

6^2t = Variance of total scores

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