# Construction and validation of a scale for the measurement of attitude of the farmers towards mobile phone based agro-advisories (MBAs) on cotton crop

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**SUMMARY :** Among the various ICT tools', majority of the Indian farmers own mobile phones. The availability and accessibility of mobile phones among the farmers was higher than any other ICT tools. Mobile phones have the advantages of having many additional services in addition to the standard voice function such as SMS for text messaging, email, packet switching for access to the Internet, gaming, Bluetooth, infrared, camera with video recorder and MMS for sending and receiving photos and video. Mobile phone is used for two way communication, helps to disseminate information, improve farmers' knowledge, increase participation and share knowledge with others. The objective of the study was to know the attitude of farmers towards mobile phone based agro-advisories (MBAs) on cotton crop, necessary scale is required. Due to the non-availability of a proper scale to measure an attitude of the farmers towards mobile phone based agro-advisories (MBAs) on cotton crop, it was thought necessary to construct a scale for the purpose of the study. Keeping this in view, an attempt has been made to develop a scale for measuring the attitude of the farmers towards mobile phone based agro-advisories (MBAs) on cotton crop. For this purpose method of summated rating scale developed by Likert's (1932) was used. Fifteen statements were selected from 25 statements for which 't' values were worked out, whose values were highest *i.e.,* with t-values more than 1.75, with equal number of both positive and negative statements.

**How to cite this article :** Reddy, K. Madan Mohan, Rao, I. Sreenivasa, Srinivasulu, M., Kumar, G.D. Satish and Vidyasagar, G.E.CH. (2017). Construction and validation of a scale for the measurement of attitude of the farmers towards mobile phone based agro-advisories (MBAs) on cotton crop. *Agric. Update*, **12** (TECHSEAR-8) : 2183-2186.

# BACKGROUND AND OBJECTIVES

A mobile phone is an Information Communication Technology (ICT) tool used for two-way communication. Mobile phone is becoming one of the basic necessities now days for all types of rural and urban people. In recent years, there has been a rapid growth

of Mobile Phone Based Agro-advisory Services (MPBAS). Hence, the study has been planned with the objective to find out the attitude of the farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop. For this purpose attitude scale was developed with the help of method of summated rating scale developed by Likert's (1932).

Edward (1969) defined attitude as the "degree of positive or negative affect associated with some psychological object".

Attitude in this study was operationalised as the degree of positive or negative feelings of cotton farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop.

## RESOURCES AND METHODS

In this study, Method of summated rating scale developed by Likert (1932) was used to construct the attitude scale of the farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop. The steps used in construction of attitude scale are as follows:

**Collection and editing of items :**
A total of 41 statements representing the attitude of the farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop were collected initially from various sources *viz.,* literature and interaction with experts and then edited on the basis of criteria suggested by Edward. Finally 25 statements were selected after the editing. The list of statements is provided in the Table 1.

The statements representing the attitude of farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop were administered to 60 respondents. The respondents were asked to indicate their degree of agreement or disagreement with each statement on five-point continuum ranging from "strongly agree" to "strongly disagree". The scoring pattern adopted was 5 weight to strongly agreed response, 4 to agreed response, 3 to undecided response, 2 to disagreed response and 1 to strongly disagreed response, if it was a favourable attitude statement and for unfavourable attitude statement the scoring pattern was reversed *viz.,* Strongly agree response with 1 weight, agree with 2, undecided with 3, disagree with 4 and strongly disagree with 5 weights in that order. Their response was recorded and the summated score for the total statements was obtained.

For each individual the maximum possible score on 25 statements is 125 and the minimum possible score is 25. The scores of the respondents were arranged in descending order. Twenty five per cent of the highest and 25 per cent of the lowest scores were taken for the item analysis, which means 15 respondents from the high group and 15 from the low group. These responses were subjected to item analysis for selection of the items that constitute the final attitude scale.

The critical ratio, *i.e.,* t-value which is 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 formula suggested by Edwards (1969).

$$t = \frac{\overline{X}_H - \overline{X}_L}{\sqrt{\dfrac{S^2H}{n_H} + \dfrac{S^2L}{n_L}}}$$

where,

$x_H$ = the mean score on a given statement for the high group.

$x_L$ = the mean score on a given statement for the low group.

$S^2_H$ = the variance of the distribution of the responses of the high group to the statement

$S^2_L$ = the variance of the distribution of the responses of the low group to the statement

$n_H$ = the number of respondents in the high group.

$n_L$ = the number of respondents in the low group.

As $n_H$ was equal to $n_L$ (15 each) the modified formula for calculating the t- values of the statements was used. The formula was:

$$T = \frac{(\overline{X}_H - \overline{X}_L)}{\dfrac{(X_H - \overline{X}_H)^2 + (X_L - \overline{X}_L)^2}{n(n-1)}}$$

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

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

After calculating the t-values for all the items of the attitude scale, the values of the statements were arranged in descending order from the highest to the lowest and 15 statements were selected from attitude scale whose values were highest *i.e.,* with t- values more than 1.75, for both positive and negative statements.

# OBSERVATIONS AND ANALYSIS

## Reliability of attitude scale :

According to Kerlinger (1973) "Reliability is the accuracy or precision of measuring instrument". To know the reliability of the attitude scale Test-retest method was used.

## Test and retest method :

The set of 15 statements which represent the attitude of respondents towards Mobile Phone Based Agro-advisories was arranged with the five-point response continuum and was administered to fresh group of 50 respondents outside the sample area. After a period of 15 days the scale was again administered to the same respondents and thus a set of score was obtained. The correlation co-efficient for both the sets were worked out which was 0.87 respectively indicating that the attitude scale was highly suitable for administration to the cotton farmers as the scale was stable and dependable in its measurement.

## Validity of attitude scale :

The validity of the test dependents upon the fidelity with which it measures what is expected to measure. The validity of the scale was examined with the help of 'content validity' by determining how well the contents of the scale represented the subject matter under study. As all the possible items covering the universe were selected by discussion with extension experts and experts from research, the present scale satisfied the content validity.

## Administration of the scale :

The scale thus met the reliability and validity test satisfactorily indicated its ability as an instrument for measuring attitude of cotton farmers towards Mobile Phone Based Agro-advisories (MBAs). Then the final selected statements of the scale were administered for the farmers to know the attitude of the farmers towards mobile phone based agro-advisories on cotton crop.

| Table 1 : Statements related to attitude of the farmers towards mobile phone based agro-advisories (MBAs) on cotton crop | | |
|---|---|---|
| Sr. No. | Statements | Calculated t values |
| 1. | Mobile Based Agro-advisories (MBAs) will provide timely information to the farmers | 1.87* |
| 2. | MBAs will never influence farmers' decision making capability | 1.94* |
| 3. | MBAs will provide quality information to the farmers | 1.83* |
| 4. | The advises received through Mobile Phone Based Agro-Advisory System is of no use | 1.89* |
| 5. | MBAs cannot meet location specific needs of the farmers | 1.84* |
| 6. | Farmers can get information on remunerative prices to their produce through MBAs | 0.98 |
| 7. | The advises received through Mobile Phone Based Agro-Advisory System may not have practical application to farmers | 1.67 |
| 8. | MBAs on pest/disease outbreak warning facilitate farmers to take plant protection measures effectively | 1.80* |
| 9. | MBAs will give accurate information to the farmers | 1.93* |
| 10. | MBAs will reduce the transaction cost to the farmers | 2.00* |
| 11. | MBAs provides all possible solutions to present agro market information needs | 0.90 |
| 12. | MBAs is a way to help farmers to deal with climate change | 1.00 |
| 13. | MBAs improves the knowledge level of the farmers on cotton cultivation practices | 1.88* |
| 14. | Lack of awareness on MBAs is a barrier for effective usage | 1.07 |
| 15. | MBAs can be delivered only to latest models of handsets only | 0.98 |
| 16. | I don't like to use any MBAs in cotton cultivation | 1.92* |
| 17. | Mobile handsets facilitate low cost access to information | 1.88* |
| 18. | MBAs save travel time of the farmers | 1.80* |
| 19. | MBAs enables direct access to market information about remote markets | 1.15 |
| 20. | MBAs can help in getting personalized information even without calling friends/relatives | 1.06 |
| 21. | The farmers market information needs cannot be satisfied with a MBAs | 1.84* |
| 22. | MBAs content is trustworthy in nature | 1.16 |
| 23. | MBAs have positive effect on farm productivity | 1.93* |
| 24. | MBAs is the fastest way of information exchange | 1.34 |
| 25. | MBAs are alternative to the present communication system | 1.99* |
| MBAs- Mobile Phone Based Agro-Advisories | | *Selected statements |

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## Conclusion :

This study aims at constructing and validation of a scale to measure the attitude of farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop. The affective aspect of attitude scale consisted of 15 items, with high reliability, and more predictive validity. This scale can be used in future studies on perceptions and feeling about the farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop. It will helpful to the policy makers and administrators to develop suitable coping strategies towards farmers by knowing the attitude of farmers towards Mobile Phone Based Agro-advisories (MBAs) on cotton crop.

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