***Original Research Article***

# A SCALE TO MEASURE THE ATTITUDE OF COTTON GROWERS TOWARDS WEATHER-BASED AGRO-ADVISORY SERVICES IN TELANGANA AND ANDHRA PRADESHSTATES.

Comment [Z1]: The Title is good (19 words)




## ABSTRACT

In this modern era, climate change is the most severe challenge experienced in agriculture. Farmers should be equipped with weather forecast information before farming to become climate smart. Hence, this study represents the construction of an attitude scale to understand the attitude of farmers towards weather-based agro-advisory services.Keeping this in view, an attempt has been made to develop a scale for measuring the attitude of farmers towards weather-based agro-advisory services in cotton cultivation. Likert's method of summated rating technique was adopted to construct the scale. Based on the available literature and expert's opinion, 40 statements were developed. After editing per informal criteria, 33ideas were subjected to item analysis among the farmers of the non-sample area. Of these, 30comments were retained in the developed attitude scale based on the highest 't' value. The reliability and validity of the constructed scale were found appropriate to measure the attitude of farmers towards weather-based agro-advisory services.


Comment [Z2]: Abstract is good (155 words)

***Keywords:*** *Attitude, Cotton growers, Farmers, Weather-based agro-advisory services, Likert scale, Summated rating technique.*

Comment [Z3]: Keywords are good, suggested minus one word (keywords maximum of five most important words)

## INTRODUCTION

In developing countries, agriculture must be transformed to meet the needs and challenges of food insecurity and climatic change (FAO, 2010). Climate change was a significant threat to humankind and resulted in severe geological, biological and ecological changes. Cline (2008) reported that changes in weather parameters like precipitation and temperature in marginal areas were expected to reduce that region's production and productivity erratically. Thus, agriculture should transition to become climate innovative to address the need for food security and the Utilization of practical resources efficiently. India has varied weather conditions, which invariably affect farming operations. Thus, farmers during each stage of farming

operations need different types of Information (Mittal, 2012), such as weather forecasts, crop protection measures, input and marketing Information.

Rivera (1996) quoted that, based on the land holding size of farmers or the agro-climatic region of the farmer, the Information required by them will differ. For this purpose and to seek advice on weather-related problems, farmers mainly depend on neighbouring farmers and input dealers (Bhaskar, 2012). Still, Claire *etal*. (2010) stated that most Indian farmers don't have such information sources. To serve this purpose, weather-based agro-advisory services are vital in providing weather forecasts to farmers through various sources. Providing weather-based agro-advisory services facilitates the farmers to plan well in advance regarding the various farm operations like sowing, fertilizer and pesticide application, manuring, transplanting, harvesting, marketing, etc. Hence, there arises a need to understand the attitude of farmers towards weather-based agro-advisory services; for this, this study was formulated to construct an attitude scale.

**Comment [Z4]:** The structure of the article must consist of Introduction, Methods, Results, discussion, and conclusion. Introduction and method are good, but recommended that the results of data analysis be given a title as the result of research, and added a discussion on each subject and given conclusions and recommendations

## METHODOLOGY

Likert's method of summated rating is adopted in constructingthe attitude scale. Kothari (2004) stated that in summated rating scale / Likert scale, the respondent is requested to respond to each statement based on their degree of agreement or disagreement in a five-point or seven-point continuum.

### 1. Collection of items

The statements were developed based on the available literature and expert's opinion;40reports were created. Based on the informal criteria Edwards gave(1957), those statements were edited, and finally,33ideas were retained.

### 2. Item analysis

The statements were sent to the non-sample area's farmers for their responses. The respondents (farmers) were requested to indicate their response as 'Strongly agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly disagree' with the scores 5, 4, 3, 2 and 1, respectively, for favourable statements and the scoring pattern is reversed for opposingopinions. Based on

the total scores obtained by the respondents, they were arranged in descending order. For each respondent, the possible highest score was 165, and the least possible score was 27.

The 't' value was calculated to identify the extent of differentiation between the highest and lowest group. The criterion group is selected by selecting 25 per cent of the respondents with the highest (high) scores and 25 per cent of the respondents with the lowest (low group) scores. To calculate the 't' value, the following formula was used.

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

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

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

Where,

$\bar{X}_H$ = the mean score on a given statement for the high group

$\bar{X}_L$ = the mean score on the same idea for the low group

$X_H$ = The Sum of scores of all subjects on a given statement for the high group

$X_L$ = The Sum of scores of all subjects on a given statement for the low group

${X_H}^2$ = Sum of squares of the individual score on a given statement for a high group

${X_L}^2$ = Sum of squares of the individual score on a given statement for low group

The calculated 't' value is presented in table.1. The ideas which possess the highest 't' value are selected.

**Table.1. Calculation of 't value.'**

| Statement number | Statement | 't' value |
|---|---|---|
| 1 | I believe whether based agro-advisories services are timely available | 3.226** |

| | | |
|---|---|---|
| 2* | I felt that the Advisory given are not practically applicable | 0.537 |
| 3 | I perceive weather forecasts given in the agromet advisory bulletins are reliable | 2.688** |
| 4* | I feel inputs and plant protection chemicals suggested in the agro advisory bulletins are difficult to purchase or not available in the market | 1.613** |
| 5 | I perceive Agro-advisory services are effective | 2.688** |
| 6* | I feel Agro Advisory messages are clear, adequate and useful | 3.226* |
| 7 | I am willing to pay for advisory services for more appropriate and valuableInformation. | 8.065** |
| 8 | I think the yield is enhanced by deploying the advisory services | 5.914** |
| 9* | I felt that the Information provided by WBAS was not timely | 0.538 |
| 10 | I perceive pest and disease occurrence was reduced by employing the advisory services | 7.523** |
| 11* | I feel agro-advisory services suggested are very costly | 5.914** |
| 12 | I foresee WBAS providingInformation on weather parameters which helps to plan farming operations in prior | 2.151** |
| 13* | I think recommended advisory services are not feasible | 2.151** |
| 14 | I perceive agro-advisory services increase the social contact | 1.075** |
| 15 | I opine traditional method of weather-based farming is more credible than WBAS | 4.301** |
| 16 | I think Information from agro-advisory services is not need-based | 4.301** |
| 17* | I think the Utilization of agro-advisory services reduces the cost of production | 6.989** |
| 18 | I think agro-advisory services are not location specific | 11.828** |
| 19* | I am ready to accept the Agro-advisory services as it suits my cropping pattern and field conditions | 6.452** |
| 20 | I felt that agro-advisory services help to mitigate the climate change | 5.376** |
| 21 | I feel that agro-advisory services reduce the dependency of farmers towards extension agents for weather information | 6.452** |
| 22* | I agree that agro-advisory services are adaptable in field conditions | 5.914** |
| 23 | I feel Agro-advisory services are challenging to avail | 5.376** |
| 24* | I think Agro advisory services are not crop specific | 6.452** |
| 25* | I believe that WBAS facilitates better crop management | 7.523** |
| 26 | I can sense the increased level of awareness among farmers towards WBAS | 0.000 |

| | | |
|---|---|---|
| 27 | I can understand that farmers prefer WBAS because of its benefits like prior crop planning | 2.688** |
| 28 | I feel that illiteracy among farmers hinders the adoption of WBAS among them | 13.441** |
| 29* | I think that Agro-advisory services are not valid on account of climate change | 8.065** |
| 30* | I admit that WBAS increased my social status among the farmers | 3.763** |
| 31 | I can feel that WBAS encouraged farmers to do prior crop planning based on weather data | 6.452** |
| 32 | I think that WBAS will motivate the farmers to adopt new cropping patterns despite their farming experience for increased benefits | 9.140** |
| 33 | I assure you that the introduction of WBAS among farmers motivated them to adopt new innovative technologies | 5.914** |

** Negative statements, ** Statements with significant t values*

**3. Selection of statements for the final attitude scale**

According to Jamal (2018), the norm to consider a report for the absolute scale was

i. a 't' value of more than 1.75.
ii. the statement should express a new idea which does not overlap with the conceptdefined by the other Information.
iii. The report should be worded and brief.

The final list of selected statements for constructingthe attitude scale is presented in table.2.

**Table.2. Final list of statements selected for construction of attitude scale**

| S. NO. | STATEMENTS | RESPONSE | | | | |
|---|---|---|---|---|---|---|
| | | SA | A | UD | D | DA |
| 1 | I believe weather-based agro-advisories services are timely available | | | | | |
| 2 | I perceive weather forecasts given in the agromet advisory bulletins are reliable | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | I feel inputs and plant protection chemicals suggested in the agro advisory bulletins are difficult to purchase or not available in the market | | | | | |
| 4 | I perceive Agro-advisory services are effective | | | | | |
| 5 | I feel Agro Advisory messages are clear, adequate and useful | | | | | |
| 6 | I am willing to pay for advisory services for more appropriate and valuableInformation. | | | | | |
| 7 | I think the yield is enhanced by deploying the advisory services | | | | | |
| 8 | I perceive pest and disease occurrence was reduced by employing the advisory services | | | | | |
| 9 | I feel agro-advisory services suggested are very costly | | | | | |
| 10 | I foresee WBAS providingInformation on weather parameters which helps to plan farming operations in prior | | | | | |
| 11 | I think recommended advisory services are not feasible | | | | | |
| 12 | I perceive agro-advisory services increase the social contact | | | | | |
| 13 | I opine traditional method of weather-based farming is more credible than WBAS | | | | | |
| 14 | I think Information from agro-advisory services is not need-based | | | | | |
| 15 | I think the Utilization of agro-advisory services reduces the cost of production | | | | | |
| 16 | I think agro-advisory services are not location specific | | | | | |
| 17 | I am ready to accept the Agro-advisory services as it suits my cropping pattern and field conditions | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 | I felt that agro-advisory services help to mitigate the climate change | | | | | |
| 19 | I feel that agro-advisory services reduce the dependency of farmers towards extension agents for weather information | | | | | |
| 20 | I agree that agro-advisory services are adaptable in field conditions | | | | | |
| 21 | I feel Agro-advisory services are challenging to avail | | | | | |
| 22 | I think Agro advisory services are not crop specific | | | | | |
| 23 | I believe that WBAS facilitates better crop management | | | | | |
| 24 | I can understand that farmers prefer WBAS because of its benefits like prior crop planning | | | | | |
| 25 | I feel that illiteracy among farmers hinders the adoption of WBAS among them | | | | | |
| 26 | I think that Agro-advisory services are not valid on account of climate change | | | | | |
| 27 | I admit that WBAS increased my social status among the farmers | | | | | |
| 28 | I can feel that WBAS encouraged farmers to do prior crop planning based on weather data | | | | | |
| 29 | I think that WBAS will motivate the farmers to adopt new cropping patterns despite their farming experience for increased benefits | | | | | |
| 30 | I assure you that the introduction of WBAS among farmers motivated them to adopt new innovative technologies | | | | | |

**Reliability and validity**

**Reliability: Test-retest method**

The final 30 statements indicating the cotton growers' attitude towards the weather-based agro-advisory services were administered on a five-point continuum scale to 30 farmers of the non-sample area. Later on, after 15 days, again, the test was again administered to the same 30 farmers, resulting in two sets of scores. The 'r' (correlation coefficient) value was 0.852,representing significance at a 1 per cent level. Hence, the constructed attitude scale was favourable to assessing the attitude of farmers towards weather-based agro-advisory services.

**Validity: Content validity**

The content of the developed scale was assessed to determine the content's extent to measuring the cotton growers' attitudes. Thus, it was observed that each of the statements had a high discriminating value representing that the scale acts as a valid measure to assess the attitude of farmers. Eventually, the constructed scale was found to have reliability and validity; thus, it can serve as a standard tool to measure the mood of farmers towards weather-based agro-advisory services.



## REFERENCES

Comment [Z5]: Minimum references are 15, and maximum references are 20 years. It is recommended that 2-3 references be added to each discussion topic, and it is suggested to be adjusted. Sufficient and up-to-date references and references must use Mendeley.


- Bhaskar, G. 2012. Mobile SMS application in agricultural information dissemination: A case on KVK, Bhabaleshwar SMS Alerts. In: *Training Manual Application of ICTs in Modified Extension Reforms*, National Institute of Agricultural Extension Management (MANAGE), Hyderabad.
- Claire, J., Glendenning, S.B and Kwadwao, A. 2010. A review of Agricultural Extension in India. Is Farmer's Information Needs Meeting? IFPRI Discussion Paper 01048.
- Edwards, A.L. Techniques of Attitude Scale Construction. *Appleton Century Crafts*. New York. 1957. 149-160.
- Likert R. A technique for the measurement of attitudes. *Archology Psychology*. 1932. 14.
- Mittal, S., Burman, R., Sharma, J.P., Sangeetha, V and Asiflequebal M. 2015. Effectiveness of mobile-based agro-advisory services in addressing information need of the stakeholders: A case of m-Krishi. *Indian Journal of Extension Education.* 51:32-38.
- Rivera, W.M. 1996. Agricultural extension in transition worldwide: Structural, financial and managerial strategies for improving agricultural extension. *Public Administration and Development*. 16:151-161.