# Assessment of Relationship between Profile Characteristics of NICRA Beneficiaries and their Attitude towards Climate-resilient Technologies

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*Authors' contributions*

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

To mitigate the climatic risk involved in the agriculture system, a shift from traditional cropping practices to climate-resilient practices of NICRA Project, is a strategy to increase farmers' income as well as agricultural sustainability. It reduces the risk to farmers from crop failure due to climate variations, by providing alternative suitable climate-resilient technologies. It also helps in the conservation of natural resources, increases food and nutritional security and helps in poverty alleviation by providing employment opportunities to the farmers. The attitude of farmers plays a crucial role in adopting any new technology. This paper analyzes the factors influencing the attitude of farmers towards climate-resilient technologies of the NICRA project in the Anantapur district of Andhra Pradesh. We studied the determinants influencing attitude towards climate-resilient technologies by using the primary data. The ex-post facto research design was used and a sample size of 60 respondents was selected using a simple random sampling technique. Out of 14

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variables, education, social participation, landholding, innovativeness, mass media exposure, extension contacts and trainings attended had a positive and significant association with farmer's attitude towards climate-resilient technologies.

## 1. INTRODUCTION

Because of climate variations, the frequency and intensity of extreme weather events are increasing every year globally. Consequently, climate variations have emerged as an inseparable and inherent component of all global debates and dialogues on sustainable development. Climate change and agriculture both are worldwide processes and are reciprocal to each other. Agriculture sector is given high priority status in most developing nations due to its cardinal contribution to their countries economic growth. Apart from enabling the sustainable and affordable provision of food and providing livelihoods to the people, it is a dependable support sector for ensuring stability to the economy in times of crisis [1]. Global warming is distinguished as one of the major changes in the weather matrix such as temperature, absolute humidity, precipitation and global solar radiation, etc. The agriculture sector is deeply ingrained with human activities and climatic conditions, and their attitudes towards climate change, the rate of changes and the impact of such changes on the entire agroecosystem including soils, crops and livestock, etc. Indian Council of Agricultural Research (ICAR) launched a project called National Initiatives on Climate Resilient Agriculture (NICRA) in February 2011 with the objective of long-term strategic research for the adaptation of crops, livestock, natural resource management and possible institutional interventions to mitigate climate change and its effects [2].

Farmers' adaptation to climate-resilient technologies mainly depends on what they perceive and how they react towards changes in climate and environment. Joshi et al. [3] reiterated that farmers' perceptions about climate change strongly affect how they deal with climate-induced risks and uncertainties, and undertake specific adaptation measures to mitigate the adverse impact of climate on agriculture. Therefore, a lack of sufficient awareness and knowledge about climate changes and the impacts on agricultural production will have adverse effects on long-term sustainable agriculture in most developing countries [4]. Farmers' perception about climate change and climate-resilient practices is a complex process that encompasses psychological constructs such as knowledge, beliefs, attitudes and concerns about if and how the climate is changing [5]. Perception of climate change and coping mechanisms are very complex ideas for the farmers because it has limited boundaries, whereas an individual's perception differs from the past and present situation [6]. Attitude is a positive or negative feeling and perception are one's understanding, which is influenced and shaped by the individuals' characteristics, their experience, the information that they receive, and the cultural and geographic context in which they live [7,8].

In general, local short-term variations can be more salient than long-term trends and therefore may have a key impact on the formation of climate change perceptions [9]. Life experiences may influence attitude, individuals who have been directly affected by extreme climatic events tend to report that the probability of such an event happening again is relatively high [10,11]. Attitude of farmers not only gears up towards on-time preparedness and effective adaptation of climate-resilient technologies. With this background, we have undertaken a study to assess the factors determining the attitude of farmers towards climate-resilient technologies.

## 2. MATERIALS AND METHODS

The study was based on the primary data collected from the Anantapur district, which is the largest and driest district of Andhra Pradesh during the year 2018 - 2019. This district was purposively selected because the NICRA has been implemented in this district since its inception. Chamaluru, Chakrayapeta, and Peravalli villages were selected purposively for the study, as NICRA was implemented in these selected villages of the Anantapur district. From each selected village, 20 respondents were selected by simple random sampling technique. Thus, making a total sample size of 60 respondents in the study as beneficiaries from NICRA villages. The ex-post facto research design was used in the study. The primary data was collected using a structured and pre-tested

interview schedule from the respondents. A list of 14 independent variables that could possibly influence the attitude of farmers towards climate-resilient technologies was prepared. The variables were age, education, occupation, type of family, type of house, social participation, farming experience, landholding, innovativeness, economic motivation, achievement motivation, mass media exposure, extension contacts and number of trainings received. To find out the degree of relationship between the variables and farmer's attitude, Pearson's correlation co-efficient was calculated. It was calculated by using the following formula:

$$r = \frac{\sum(XY) - \frac{\sum X \sum Y}{n}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{n}\right]\left[\sum Y^2 - \frac{(\sum Y)^2}{n}\right]}}$$

Where,

R = Correlation coefficient
X = Independent variable
Y = Dependent variable
N = Total number of respondents

## 3. RESULTS AND DISCUSSION

Correlation analysis was performed to find out the relationship of independent variables with the attitude of farmers towards climate-resilient technologies. The results are presented in Table 1.

It could be seen from Table 1, among the socio-personal factors, education, number of trainings received and social participation of farmers were showing positive and significant correlation with their attitude towards climate-resilient technologies. Whereas, age, occupation type of family and type of house did not show significant association with the attitude towards climate-resilient technologies. It means that education and social participation helps an individual to get acquainted with the skills that are required for undertaking the new technologies in agriculture. These results are in line with the study of Obayelu et al. [12] and Nolyn et al. [13].

It can be noticeable that amongst the agro-economic factors, landholding showed a highly significant and positive correlation, whereas farming experience showed a positive and non-significant correlation with the attitude towards climate-resilient technologies. Farmers with a larger size of landholding could afford to use new technologies in agriculture. The research results were similar to the study of Charitha [14].

**Table 1. Relationship of profile characteristics with attitude towards climate-resilient technologies**

| Independent variables | Correlation coefficient 'r' |
|---|---|
| Age | 0.093 [NS] |
| Education | 0.439 ** |
| Occupation | 0.023 [NS] |
| Type of family | -0.068 [NS] |
| Type of house | 0.143 [NS] |
| Social participation | 0.347** |
| Farming Experience | 0.132 [NS] |
| Land holding | 0.517** |
| Innovativeness | 0.617** |
| Economic motivation | 0.127 [NS] |
| Achievement motivation | 0.014 [NS] |
| Mass media exposure | 0.324** |
| Extension contacts | 0.428** |
| Number of trainings received | 0.243* |

*\* Significant at 0.05 level; \*\* Significant at 0.01 level; NS -Non Significant*

It can be seen that amongst the psychological factors, innovativeness, mass media exposure and extension contacts had shown positive and highly significant correlation whereas economic motivation and achievement motivation had shown positive but non-significant correlation with the attitude of farmers towards climate-resilient technologies. An individual develops an attitude if he has an opportunity to expose more sources of information like mass media and extension contacts. Farmers who have use of more mass media and higher extension contacts are favourably predisposed to acquire information, skills and other factors related to newly available technologies in agriculture. The findings of the study were in accordance with Vinayak [15].

## 4. CONCLUSION

The overall assessment showed that out of fourteen variables, seven variables viz. education, social participation, landholding, innovativeness, mass media exposure, extension contacts and trainings attended had a positive and significant association with farmer's attitude towards climate-resilient technologies. This is clearly evident in the determinants that are directly influencing the attitude of the farmers towards climate-resilient technologies. This indicates the need for an integrated extension effort to motivate the farmers for bringing a positive attitude towards climate-resilient agriculture which can be done by creating more awareness through mass media and delivering trainings related to climate-resilient technologies.

These suggestions may lead to narrowing down the adoption gap of climate-resilient technologies of the NICRA project by the farming community.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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