

# Factors Influencing the Relationship Between the Profiles of the Farmers with their Knowledge Level to Overcome the Adverse Effects of Climate Change

Sesenlo Kath<sup>\*1</sup>, K. Kanagasabapathi<sup>2</sup> and V. Sakthivel<sup>3</sup>

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## ABSTRACT

Knowledge is one of the important components, which would have a major influence on the behavior of the individual. In the present study, knowledge denotes the farmers' understanding about the climate change. The results of correlation analysis show that out of fourteen independent variables viz., educational status, social participation, mass media exposure, risk orientation, scientific orientation and innovativeness had shown positive and significant relationship with their knowledge level to overcome the adverse effects of climate change. Among the significant variable's social participation and mass media exposure were found to be significant at one per cent level probability whereas the remaining variables viz., educational status, risk orientation, scientific orientation and innovativeness were significant at five per cent level of probability. The regression co-efficient of variables viz., social participation ( $X_7$ ) and mass media exposure ( $X_9$ ) were found to be positive and significantly associated with the knowledge level of respondents at 1 per cent. The regression co-efficient of variables viz., educational status ( $X_2$ ), risk orientation ( $X_{11}$ ) scientific orientation ( $X_{12}$ ) and innovativeness ( $X_{13}$ ) were found to have positive and significant association with the knowledge level of the respondents at 5 per cent of probability.

**Key words:** Knowledge, Climate change, Adverse effects, Correlation, Regression

Knowledge is a familiarity or understanding of someone or something such as facts, information, descriptions or skills which is acquired through experience or education by perceiving, discovering or learning. Assessing knowledge level of respondents on climate change is one of the objectives of the study. Limited knowledge exists about the kind and intensity of climate change impact in the North eastern states particularly Nagaland state and the region has, limited practical experience in adapting to climate change. Further, the State Action Plan on Climate Change (SAPCC) highlights the problem of the limited or fragmental knowledge linked to climate change that is available at the state level [1]. Climate change poses a major threat to the semi-arid tropics, which is characterized by scanty and uncertain rainfall, infertile soils, poor infrastructure, extreme poverty and rapid population growth [2]. The farmer faces challenges from changes in climate - irregularities in rainfall i.e., early onset of rain, high intensity of hailstone, thunderstorm, labour intensity and pest infestation and subsequent low productivity [3]. Farmers

expressed that the type of pest and disease attack is similar but the incidences has increased in comparison to the past and are widespread in wet and terrace land.

## MATERIALS AND METHODS

The investigation was carried out in Chunlikha block of Kohima district, Nagaland state in India. To measure the knowledge level of the respondents about climate change, knowledge test was constructed and adopted in this study. The respondents were selected from six villages out of thirteen villages under Chunlikha Rural development block. Proportionate random sampling technique was adopted to select a sample size of 300 respondents. The test contains questions about the climate change to know their knowledge level. The knowledge level of the respondents about climate change was measured by designing exclusively the knowledge test in the aspects like 'changes in weather/climate', 'extreme climatic events', 'rainfall pattern', 'effects crop yield', 'deforestation', 'rise in temperature', 'environmental pollution', 'incidences of pest and diseases outbreak', 'flash floods and landslides', 'increasing heat and cold waves', 'indiscriminate use of pesticides and chemical fertilizers' etc. These items were administered to the respondents in the study area. The responses were obtained in a dichotomized scale as correct and incorrect responses. Each correct response was assigned a score of 'two', while incorrect got a score of 'one'. The zero-order correlation co-efficient ( $r$ ) and linear multiple

**\*Sesenlo Kath**

sesenlokath@gmail.com

<sup>1</sup>Krishi Vigyan Kendra (KVK) Kohima, Tseminyu - 797 109, District Kohima, Nagaland, India

<sup>2-3</sup>Department of Agricultural Extension, Faculty of Agriculture, Annamalai University, Annamalai Nagar - 608 002, Tamil Nadu, India

regression analyses were employed to study the relationship and contribution of profile characteristics of the respondents with their knowledge.

## RESULTS AND DISCUSSION

The characteristics of respondents play a very important role in determining their knowledge level of climate change. The zero-order correlation co-efficient (r) and linear multiple

regression analyses were employed to study the relationship and contribution of profile characteristics of the respondents with their knowledge about climate change to overcome the adverse effects of climate change and the results are presented in (Table 1).

An empirical model indicating the relationship between the profile characteristics of the respondents with their knowledge to overcome the adverse effects of climate change is presented in (Fig 1).

Table 1 Association and contribution of profile characteristics of the respondents with their knowledge to overcome the adverse effects of climate change (n= 300)

Variable No.	Variables	Correlation co-efficient 'r' value	Standardized regression co-efficient	Standard error	't' values
X <sub>1</sub>	Age	0.006 NS	0.058	0.551	0.526 NS
X <sub>2</sub>	Educational status	0.216*	1.476	0.652	2.263 *
X <sub>3</sub>	Occupational status	0.134 NS	0.098	0.432	0.887 NS
X <sub>4</sub>	Family size	0.062 NS	-0.084	0.513	-0.885 NS
X <sub>5</sub>	Farm size	0.065 NS	-0.086	0.515	-0.888 NS
X <sub>6</sub>	Annual income	0.019 NS	-0.019	0.057	-0.194 NS
X <sub>7</sub>	Social participation	0.269**	1.218	0.418	2.193 **
X <sub>8</sub>	Training exposure	0.190 NS	-0.198	0.701	0.832 NS
X <sub>9</sub>	Mass media exposure	0.267**	0.478	0.166	2.879**
X <sub>10</sub>	Extension agency contact	0.026 NS	0.013	0.043	0.138 NS
X <sub>11</sub>	Risk orientation	0.205*	0.946	0.512	1.847*
X <sub>12</sub>	Scientific orientation	0.217 *	2.141	1.872	1.677 *
X <sub>13</sub>	Innovativeness	0.220 *	2.145	1.876	1.679 *
X <sub>14</sub>	Decision making ability	0.097 NS	0.088	0.228	0.924 NS

A = 6.945

R<sup>2</sup> = 0.5238

F = 6.745\*\*

\*\*Significant at 1 per cent level of probability

\*Significant at 5 per cent level of probability

NS- Non significant

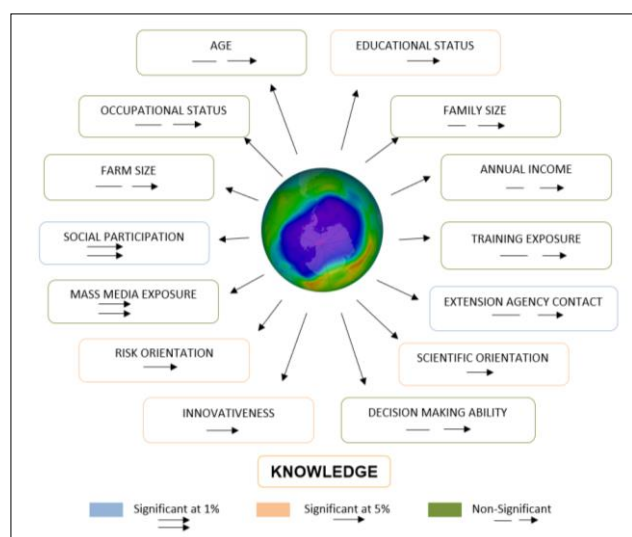


Fig 1 Empirical model showing relationship between the profile characteristics of the respondents with their knowledge to overcome the adverse effects climate change

### Correlation

The results of correlation analysis in (Table 1, Fig 1) shows that out of fourteen independent variables viz., educational status, social participation, mass media exposure, risk orientation, scientific orientation and innovativeness had shown positive and significant relationship with their knowledge level to overcome the adverse effects of climate change. Among the significant variable's social participation and mass media exposure were found to be significant at one

per cent level probability whereas the remaining variables viz., educational status, risk orientation, scientific orientation and innovativeness were significant at five per cent level of probability [4]. Social participation had shown positive and significant relationship at 1 per cent of probability with knowledge level of the respondents. This might be due to the reason that the variable social participation would have influenced the respondents to expose new information, skills and knowledge through exchange of ideas. Social participation helps them to know the changes in the surroundings especially changes in the climate [5].

Mass media exposure had shown positive and significant relationship at 1 per cent of probability with knowledge level of the respondents. The possible reason for positive and significant association might be that the respondents who have mass media exposure always tend to know the changes in their surroundings through access to different media like radio, television, internet, newspaper etc. Hence there was significant association between mass media exposure and knowledge level of the respondents to overcome the ill effects of climate change. It could be justified that the variable mass media exposure would have provided more information to the farmers [6].

Educational status showed positive and significant relationship with knowledge level of at 5 per cent level of probability. Education plays a vital role in acquisition and understanding the information about climate change. Formal education of the respondents might have helped to a greater extent to acquire knowledge. It is quite understandable that the educated person could perceive information faster and thus paving the way for better understanding and knowledge [7].

Risk orientation had shown positive and significant relationship at 5 per cent level of probability with knowledge level. Adoption of modern technologies involves certain degree of knowledge and risk. It is normal for the respondents with more risk orientation to have certain degree of knowledge about the climate change and its adverse effects. Hence the respondents with high-risk orientation would have learnt the modern technologies of climate change [8].

Scientific orientation was found to have positive and significant relationship with knowledge level at 5 per cent level of probability. The respondents who had higher aspiration adopted more scientific methods of cultivation. As most of the farmers have medium level of scientific orientation, they might have learnt about scientific practices to a greater extent [9].

Innovativeness had shown positive and significant relationship at 5 per cent level of probability with the knowledge of climate change issues. Innovativeness plays greater role in the individual personality. The person with higher innovativeness can do things rapidly and more precisely than others. The study implied that, the respondents having medium level of innovative proneness have more knowledge of climate change. Medium to high level of innovativeness of respondents might have motivated them to seek new knowledge in regard to climate change [10].

### Regression

In order to find out which of the independent variables explained the variation in the dependent variable and also to know the extent of contribution made by these variables, multiple regression analysis was carried out and the results are presented in this section. The results of multiple regression analysis of profile characteristics with their knowledge level of the respondents are presented in (Table 1).

It could be observed from (Table 1, Fig 1) that the  $R^2$  value was 0.5238 which implied that 52.38 per cent variation in the independent variable included in the study. The 'F' value was 6.745 found to be significant at 1 per cent of

probability. There existed a linear functional contribution between the independent variables and knowledge level. The prediction equation for the respondents is as follows:

$$Y = 6.945 + 0.058 (X_1) + 1.476 (X_2) + 0.098 (X_3) - 0.084 (X_4) - 0.086 (X_5) - 0.019 (X_6) + 1.218 (X_7) - 0.198 (X_8) + 0.478 (X_9) + 0.013 (X_{10}) + 0.946 (X_{11}) + 2.141 (X_{12}) + 2.145 (X_{13}) + 0.088 (X_{14})$$

It could be seen from the equation that, the regression co-efficient of variables viz., social participation ( $X_7$ ) and mass media exposure ( $X_9$ ) were found to be positive and significantly associated with the knowledge level of respondents at 1 per cent. The regression co-efficient of variables viz., educational status ( $X_2$ ), risk orientation ( $X_{11}$ ) scientific orientation ( $X_{12}$ ) and innovativeness ( $X_{13}$ ) were found to have positive and significant association with the knowledge level of the respondents at 5 per cent of probability [11].

The strength and contribution of these variables can be explained as a unit increase ceteris paribus in educational status ( $X_2$ ), social participation ( $X_7$ ), mass media exposure ( $X_9$ ), risk orientation ( $X_{11}$ ), scientific orientation ( $X_{12}$ ) and innovativeness ( $X_{13}$ ) would increase the adoption of adaptation strategies of the respondents by 1.476, 1.218, 0.478, 0.946, 2.141 and 2.145 units respectively [12].

### CONCLUSIONS

It could be concluded that the respondents who had more educational status, social participation, mass media exposure, risk orientation, scientific orientation and innovativeness would be with higher knowledge level of adaptation strategies to overcome the adverse effects of climate change. Hence to increase the level of knowledge of farmers on adaptation strategies, efforts can be focused on educational status, social participation and mass media exposure.

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