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RELATIONSHIP ANALYSIS BETWEEN FARMERS' PROFILE AND THEIR CLIMATE CHANGE PERCEPTION

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ABSTRACT

In the majority of emerging nations, agriculture serves as the economic foundation. Agriculture also offers a huge population job options in addition to food and raw materials. Global climate change and agriculture are intricately related processes. The most important concern impacting the existence of the human race in the 21st century has been deemed to be climate change. It has the ability to affect agriculture both directly and indirectly. India's ecological and social systems are already under a great deal of stress as a result of the country's fast industrialization, urbanisation, and economic growth. A study was conducted in Junagadh, Jamnagar, Rajkot, Amreli and Porbandar districts of Gujarat state to assess the perception of farmers about climate change and to ascertain the association between the characteristics of farmers and their level of perception. A sample of 280 respondents was selected for present study.Majority (62.86 per cent) of farmers had medium level of perception about climate change, while 20.36 per cent and 16.78 per cent of farmers fall under the category of high level and low level of perception about climate change, respectively.There was positive and highly significant relationship between education, farming experience, access to weather forecast, extension participation, farm mass media, risk orientation, innovativeness, economic motivation, scientific orientation and decision making ability and their level of perception about climate change.Whereas, regression analysis of perception of farmers about climate change revealed that education, farming experience, access to weather forecast, innovativeness, scientific orientation and decision making ability were contributing significantly to perception about climate change.

Keywords : *level of perception, relationship, climate change, farmers, agriculture farming*

INTRODUCTION

Climate change has been considered to be most vital issue affecting the survival of human race of the 21st century. There has been a continuous debate, putting the blame on each other for being more responsible for climate change. Climate change is expected to have a serious andlasting impact on agriculture sector in India (Ghasura *et al*., 2021). The most important impact of the climatechange can be observed in obvious terms of global temperature increase popularly knownas global warming. There was a worldwide increase (0.4-0.7˚C) in temperature (Singh *et al.,* 2013).

Agriculture is the backbone of economy in most of the developing countries. Inaddition to food and raw material, agriculture also provides employment opportunities tolarge population. Agriculture and global climate change are inextricably linked processes. Climate change has the potential to have an immediate and indirect impact on agriculture. Changes in average temperatures, rainfall, and climate extremes (e.g., heat waves); changes in pests and diseases; changes in atmospheric carbon dioxide and ground-level ozone concentrations; changes in the nutritional quality of some foods; and changes in sea level can all have negative consequences.

Climate change directly affects agriculture production as this sector isinherently sensitive to climatic conditions and is one of the most vulnerable sectors at therisk and impact of global climate change (Parry *et al.,*2005; Vinaya *et al.,* 2022). Subject to the vagaries of climate change, the state of Gujarat is culpably assisted, as it is, by rapid industrialization and the drive for economic development (Vinaya and Shivamurthy, 2021). It all took an unmitigated toll on humanity. There is no gainsaying that climatechange impacts human life and the ecosystem and thereby, the economy. Take, for instance, temperature changes that continue to affect both agriculture and livestock.

Perception refers to the process concerned with the acquisition and interpretation of information from one's environment. Perception of the farmers is also changing as the climate is changing day by day. As the temperature is increasing, rainfall is shifting and heavy climatic disaster is

occurring. The farmers have more concerns about the climate and pattern of climate change as it has serious impact on crop production. The perception of the farmers is changing.

OBJECTIVES

(1) To assess the perception of farmers about climate change on agriculture farming

(2) To ascertain the relationship between the characteristics of farmers and their level of perception aboutclimate change on agriculture farming

METHODOLOGY

"*Ex-post facto*" research design was applied for this study. Kerlinger, F. (1969) stated that "*Ex-post facto*" design is worthy is apply when the independent variable has already acted upon. For drawing the sample for the study multistage random sampling technique was used. The study was carried out in Junagadh, Jamanagar, Rajkot, Amreli and Porbandar districts of Gujarat state.Two talukas from each district and two villages from each taluka were selected randomly. Total twenty villages were selected for the study. From each selected village fourteen farmers were selected for the study. Thus, total 280 respondents were selected randomly for the study.

RESULTS AND DISCUSSION

Perception of farmers about climate change on agriculture farming

People's perception is very much useful to establish the fact that the particular region is facing direct or indirect problems in agriculture and other activities due to climate change. Consequently, understanding the perception of climate change by farmers is important as perception can shape the preparedness of these actors to adopt and change their practices. The data regarding level of perception are given in Table 1.

Table 1 : Distribution of respondents according to their perception about climate change (n=280)

Sr. No.	Perception about climate change	Frequency	Percent
1	Low level of perception (up to 16.43 score)	47	16.78
2	Medium level of perception (16.44 to 32.71 score)	176	62.86
3	High level of perception (above 32.71 score)	57	20.36
	Total	**280**	**100.00**
Mean = 24.57			S.D. = 8.14

It can be observed from the Table 1.1 that Majority (62.86 per cent) of farmers had medium level of perception about climate change, while 20.36 per cent of farmers fall under the category of high level of perception about climate change. The remaining 16.78 per cent farmers had low level of perception about climate change.

This might be due to the reason that the farmers had medium level of education, farming experience, social participation, extension participation, moreinnovativeness,moreriskbearingability, medium to high exposure to mass media, access to weather forecast and decision making ability arehelp them to get better understanding regarding underlying issues and causes of climate change.

The present findings were in line with the findings ofManjunath (2016), Ansari *et al.* (2018) and Bhagat *et al.* (2018).

Association between level of perception about climate change and profile of the farmers

In order to ascertain the relationship between the level of perception (dependent variable) of farmers about climate change and each of their selected characteristics (independent variable), the correlation co-efficient ('r') were calculated. The empirical hypotheses were stated for testing the relationship and its significance on zero order correlation are given in Table 2.

Table 2 : Correlation between profile of the farmers and their level of perception about climate change (n=280)

Sr. No.	Name of the independent variable	'r' value
X_1	Age	0.0892^{NS}
X_2	Education	0.4983^{**}
X_3	Farming experience	0.5116^{**}
X_4	Annual income	0.1126^{NS}
X_5	Size of land holding	0.0887^{NS}
X_6	Social participation	0.1457^{*}
X_7	Irrigation facility	0.0982^{NS}
X_8	Access to weather forecast	0.3539^{**}
X_9	Extension participation	0.3751^{**}
X_{10}	Farm mass media	0.4512^{**}
X_{11}	Risk orientation	0.3263^{**}
X_{12}	Innovativeness	0.4138^{**}
X_{13}	Economic motivation	0.4931^{**}
X_{14}	Scientific orientation	0.4034^{**}
X_{15}	Degree of worry	0.1410*
X_{16}	Decision making ability	0.2817^{**}

NS= Non-significant *= Significant at 0.05 level
**= Significant at 0.01 level

The independent variables like education, farming experience, access to weather forecast, extension participation, farm mass media, risk orientation, innovativeness, economic motivation, scientific orientation and decision making ability had positive and highly significant relationship with level of perception about climate change, while variables like social participation and degree of worry had positive and significant relationship withlevel of perception about climate change. The variables like age, annual income, size of land holding and irrigation facility showed positive and non-significant relationship with level of perception about climate change.

The present findings were in line with the findings of Omprakash (2016).

Functional relationship between perception about climate change and profile of farmers

The correlation coefficient provides the strength and direction of association between the two characters or variables, but does not reflect on predictive ability of independent variables to the dependent variable. Hence, in order to assess the amount of contribution (influence or predictive abilities) of all independent variable to the perception about climate change, the multiple regression analysis was carried out with the help of computer programme.

Table 3 : Regression coefficients between selected independent variables of the farmers with their perception about climate change

(n = 280)

Sr. No.	Independent variables	Regression coefficient (bi)	S. E. of bi	't' value
X_1	Age	-0.857	0.765	-1.123
X_2	Education	0.063	0.017	3.805**
X_3	Farming experience	2.050	0.521	3.938**
X_4	Annual income	-0.030	0.128	-0.027
X_5	Size of land holding	0.025	0.029	0.881
X_6	Social participation	0.005	0.011	0.514
X_7	Irrigation facility	0.194	0.567	0.341
X_8	Access to weather forecast	0.320	0.155	2.291*
X_9	Extension participation	0.378	0.264	1.443
X_{10}	Farm mass media	0.234	0.462	0.512
X_{11}	Risk orientation	-0.312	0.610	-0.510
X_{12}	Innovativeness	0.132	0.036	6.554**
X_{13}	Economic motivation	0.034	0.032	1.023
X_{14}	Scientific orientation	0.664	0.301	2.204*
X_{15}	Degree of worry	-0.013	0.376	-0.036
X_{16}	Decision making ability	0.565	0.246	2.294*

* = Significant at 0.05 level R^2 = 61.93

** = Significant at 0.01 level

It is clear from the results of the regression analysis presented in Table 1.3, that majority of the independent variables considered in the study together exerted significant influence on the perception of farmers about climate change. The analysis of coefficient of total variation explained by independent variables (R^2 = 61.93) in perception of farmers about climate change. The remaining variation was thus due to other unidentified factors not considered in the study.

The results presented in the table also pointed out that variables like education, farming experience and innovativeness are crucial factors (highly significant) in deciding the perception of farmers about climate change.

Other independent variable like access to weather forecast, scientific orientation and decision making ability (significant) contributed largely with the perception of farmers about climate change. Remaining variables have failed to contribute significantly in perception of farmers about climate change.

CONCLUSION

It can be concluded that majority of farmers had medium level of perception about climate change on agriculture farming. There was positive and highly significant relationship between education, farming experience, access to weather forecast, extension participation, farm mass media, risk orientation, innovativeness, economic motivation, scientific orientation and decision making ability and their level of perception about climate change on agriculture farming.Whereas, regression analysis of perception of farmers about climate change revealed that education, farming experience, access to weather forecast, innovativeness, scientific orientation and decision making ability were contributing significantly to perception about climate change.

IMPLICATIONS

(1) The findings of this study would facilitate in knowing the existing level of perception of farmers about climate change. The study concluded that majority of farmers

had medium to high level of perception about climate change. This indicates that more efforts are needed to develop and improve their perception about climate change.

(2) The findings of this study in terms of personal, social, economic, communicational and psychological characteristics of the farmers would act as guidance to the policy makers to plan, implement and evaluate reforms in the field of agriculture farming.

(3) Subject Matter Specialists, Agricultural Extension Officers should visit the village and guide farmers to solve field problems of the farmers in accordance with the climate change.

CONFLICT OF INTEREST

There is no conflict between author.

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