STUDY ON KNOWLEDGE LEVEL OF FARMERS TOWARDS CLIMATE CHANGE ON CROP PRODUCTION AT UDAIPUR DISTRICT, RAJASTHAN

ABSTRACT

Climate change is one of the most serious ecological problems, and it has a wide-scale effect on agricultural productivity all over the globe. In general, farmers know little about climate change, and their understanding of its impacts on agriculture is poor. Additionally, farmers play the most important role in supporting the economy. This research was conducted to understand farmers' knowledge about climate change. Check the level of knowledge they have. The present study, 'knowledge level of farmers towards climate change on crop production at Udaipur district, Rajasthan', was conducted in 2023. A total of 120 participants were selected from six different villages' two tehsils, VallabhnagarandMavli**.** The research revealed that farmers' knowledge about climate change was ascertainedat (a×) medium level and the independent variables (age, gender, caste, education, occupation, annual, income, marital status, family type house, farming experience, Economic motivation. .....

Keywords: Climate change; Knowledge.....

INTRODUCTION

Climate change is one ofthebiggest problems facing theworld today.The Inter-governmentalthe Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess climate change based on new scientific finding**.** IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas emissions [1].One of the inputs for the agricultural expansion and survival of linked communities is the climate. The primary cause of global agricultural crop losses each year is direct weather-related effects. The burning of fossil fuels, rapid industrialization, and deforestation increase atmospheric carbon dioxide (CO_2) and other greenhouse gases, such as methane (CH_2), nitrous oxide (N_2O), and chlorofluorocarbons (CFC). These gases create a layer in the atmosphere that keeps the earth from emitting long-

wave radiation that would have otherwise escaped into space. The average world temperature is rising as a result [2].

Farmers see the climate change issue from a different point of view compared to scientists. In other words, scientists describe climate change in particular ways, whereas farmers do it based on social values, engagements with the local communities, and the constructs of climate change, knowledge and comprehension to cope with climate change impacts[3]. Due to rising temperatures, it is predicted that agricultural crop output in Asia will decrease by up to 5 to 30 percent by the year 2050s. This decrease in agricultural produce will cause food insecurity, which will emerge as the greatest threat to humankind in the future [4]. The irregularities in the rainfall patterns, such as late or early rains and poor distribution of rainfall, were the major factors that affected the performance of the crops. Furthermore, temperature fluctuations have also been seen as a catalyst for pests and diseases by enhancing the multiplication of pathogens and their survival periods [5].

The farming sector already faces issues with sustainability, yield decline, soil degradation, water logging, price volatility, natural disasters, and small farm sizes. The growing population increases the demand for sustainable food supplies. In addition to these huge challenges, climate change puts more pressure on agriculture, which has an impact on the poor population [6].And farmers are the most affected when it comes to climate change and agriculture. So it is necessary for them to have a complete idea of what climate change is and how it is affecting agriculture.

The present study focuses on assessing the knowledge of farmers about climate change. It helps in identifying how much knowledge farmers' have about theclimate change. And when it comes to agriculture and climate change, farmers are the most impacted. Thus, it is imperative that they possess an in-depth knowledge of the nature of climate change and its impact on agriculture. The goal of the current study is to assess farmers' knowledge of climate change. It contributes to determining the level of climate change awareness among farmers.

The following specific objectives are study in the paper:

1. Socio- economic profile of the respondents.

2. Knowledge of farmers towards climate change.

3. Association between selected dependent variableswith independent variables.

METHODOLOGY

The present study was conducted in Mavli and Vallabhnagar of Udaipur, District of Rajasthan, and was purposefully selected in 2023. Udaipur district was purposively selected because the district has a hot, semi-arid climateas evident that, we can see how climate change has already affected the region of Udaipur during the past 40 years. Six villages, namely Akodra, Bhimal, Dabok, Ghasa, Adinda, Daroli, Maharaj ki Kheri and Peepal, were randomly selected. An interview programschedulewith relevant questions was prepared and piloted before the study. Sample sizes of 120 participants were selected through random sampling from six villages and wentAsk questions about climate change through personal interviews and write down answers. This study adopted a descriptive research design. Responses were recorded on a 3-point continuous scale; completely correct, partially correct, and incorrect are scored as 3, 2, and 1, respectively. All information was taken into account, and participants were divided into low (20–25 points), medium (25–30 points), and high (30–35 points). KarlPearson'sCo-efficientofCorrelation was used performedso asto analyze the relationship between selected independent variable and knowledge level of farmers' i.e. Dependent variable.

KarlPearson'sCo-efficientofCorrelation:

It was used to find out the relationship between two variables. Pearson's product moment correlation coefficient was calculated using the formula,

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

RESULT AND DISCUSSION

Table 1. Distribution of respondents based on their socio-economic profile

S. No.	Category	Frequency	Percentage
Age			

1.	Up to 35 years	20	16.66
2.	36 to 50 years	78	65
3.	Above 50 years	22	18.33
Gender			
4.	Male	48	40
5.	Female	72	60
Caste			
6.	General	42	35.00
7.	Other Backward Class	49	40.83
8.	Scheduled tribe	20	16.66
9.	Scheduled caste	9	7.5
Education			
10.	Illiterate	33	27.5
11.	Primary Level	45	37.5
12.	Secondary Level	19	15.83
13.	High School	15	12.5
14.	Intermediate level & above	8	6.66
Occupation			
15.	Farming only	61	50.83
16.	Farming +business	42	35.00
17.	Farming + Service	17	14.16
Annual income			
18.	Low income (Up to Rs 48,000)	32	26.66
19.	Medium income (Rs 48,001 to 96000)	39	32.5
20.	High income (Above Rs. 96000)	49	40.83
Marital Status			
21.	Married	87	72.5
22.	Unmarried	31	25.83
23.	Other	2	1.66
Family type			
24.	Nuclear family	68	56.66
25.	Joint family	52	43.33

Farming experience of respondent			
26.	Low level (up to 6 years)	26	21.66
27.	Medium level (7 to 10 years)	43	35.83
28.	High level (above 10 years)	51	42.5
Economic motivation			
29.	LowEconomic motivation **(**11-12)	26	21.66
30.	Medium Economic motivation **(**13-14)	57	47.5
31.	High Economic motivation **(**>15)	37	30.83

Socio-economic status of the respondents: as can be seen from Table 1 above, most of the respondents to this study were 16.66 percent in the (up to 35) year age group, followed by 65 percent in the 36–50 year age group, and 18.33 percent belonged to the 50-year-old age group. Regarding gender, the majority of 60 percent of respondents are female, and 40 percent of respondents are male. Regarding caste, it was found that 35.00 percent belonged to the general category, followed by 40.83 percent in OBC, 16.66 percent in the scheduled tribe category, and 7.5 percent in the scheduled caste category. Regarding education, 27.5 percent of respondents are illiterate, 37.5 percent had a primary education, 15.83 percent of respondents had a secondary school education level, 12.5 percent of the respondents had a high school education level. Lastly, only 6.66 percent of respondents were intermediate or above their education level. Regarding occupation. The majority of the respondents are engaged in farming only, at 50.83 percent. About 35.0 percent of respondents are engaged in both farming and business. Similarly, 14.16 percent of the respondents are involved in both farming and service. Regarding annual income, the majority of respondents have a have a high income level (above Rs. 96,000), which is 40.83 percent of the respondents. The medium-income category (Rs 48,001 to 96,000) is comprised of 32.5 percent of respondents. The low-income category (up to Rs 48,000) has only 26.66 percent of respondents. Regarding marital status, it was found that 72.5 percent of respondents are married and 25.83 percent are unmarried. Only 1.66 percent of respondents are in another category. Regarding family type, the majority 56.66 percent belong to the nuclear family type, and 43.33 percent belong to the joint family type. Regarding the farming experience of respondents, a majority of 42.5 percent have high levels of participation and farming experience, while 35.83 percent have medium levels and 21.66 percent have low levels of farming experience. Regarding economic

motivation among the respondents, 21.66 percent have low economic motivation, 47.5percent have medium economic motivation, and30.83 percent have high economic motivation.

Table 2. Distribution of respondent based on level of knowledge on climate change

S. No.	Statement	Fully correct (FC)		Partially correct (PC)		Not Correct (NC)	
		F	P	F	P	F	P
1.	Temperature has risen from previous years	96	80	17	14.16	7	5.83
2.	Changing rainfall pattern from previous year	52	43.33	63	52.5	5	4.16
3.	Climate change causes massive floods	22	18.33	34	28.33	64	53.33
4.	Crop failure is an effect of climate change	68	56.66	52	43.33	-	-
5.	Climate change is causing draught	88	73.33	21	17.5	11	9.16
6.	Untimely monsoons have arrived	93	77.5	23	19.16	2	1.66
7.	Increase heat waves speed	43	35.83	65	54.16	12	10
8.	One of the causes of climate change is the burning of agricultural waste.	8	6.66	28	23.33	84	70
9.	Climate change affects soil fertility through storms and heavy rainfall	19	15.83	34	28.33	67	55.83
10.	The impact of Climate change on food security	79	65.83	33	27.5	8	6.66
11.	Crop season length has increased	33	27.5	68	56.66	19	15.83
12.	Climate change is also a result of forest and tree cutting	76	63.33	31	25.83	13	10.83
13.	High market price due to most of the crop spoilage that is also due to climate change	73	60.83	40	33.33	7	5.83
14.	Agricultural income is affected by climate change	62	51.66	47	39.16	11	9.16
15.	Heavy rains caused by climate change incr ease the number of pests and disease	38	31.66	65	54.16	17	14.16

16.	High use of automobiles is also the cause of climate change	47	39.16	55	45.83	18	15

Farmers' knowledge on climate change: shown in Table 2that majority of farmers 80 per cent had full knowledge about increased temperatures and 52.5 percent farmers had partial knowledge about changing rainfall pattern. Majority of farmers 53.33 percent had not aware about climate change causes massive floods. Majority of farmers had full knowledge 56.66 percent on climate change is resulting in failure of crops. Majority of farmers 73.33 percent farmers had full knowledge on climate change is causing draught. Majority of farmers 77.5 percent had full knowledge about untimely monsoons. Farmers were able to easily recognize the changes in the weather. 54.16 percent had partial knowledge on heat wave speed. Many farmers do not know that burning agricultural waste contributes to climate change. The majority of farmers 70 percent were unaware that burning agricultural waste was one of the factors contributing to climate change. 55.83 percent farmers had not knowledge on climate change affects soil fertility through storms and heavy rainfall and 65.83 percent had full knowledge on climate change affecting food security. Majority of farmers 56.66 percent had partial knowledge about increase in crop season length. Majority of farmers 63.33 percent farmers had full knowledge about forest and tree cutting (deforestation) is most reason causing climate change and 60.83 percent had partial knowledge about high market price due to most of the crop spoilage that is also due to climate change. Majority of farmers 51.66 percent had full knowledge about agricultural income is affected by climate change and majority of farmers 54.16 percent had partial knowledge on climate change causing disease and pest infections through heavy rainfall which is mostly unseasonal. Majority of farmers 45.83 percent had partial knowledge on high use of automobiles is also the cause of climate change.

Table 3. Distribution of respondent based on overall level of knowledge on climate change

S. No.	Knowledge	Frequency	Percentage
1.	Low (20-25)	18	15
2.	Medium (25-30)	79	65.83
3.	High (30-35)	23	19.16
Total		**120**	**100.00**

From the above table3, it is found that the level of knowledge about climate change is medium 65.83 percent, followed by high 19.16 percent and low15 percent, respectively, because most farmers have limited influence and do not know much about the current situation of climate change. The farmers received some information from students who visited the villages during the project and from social workers who carried out plastic-free projects. Judging by their exposure to media such as radio and television, Farmers rarely come into contact with agricultural or extension officials. They often rely on farmers for new information or continue to rely on the knowledge of their ancestors. However, few farmers have good connections with agricultural services and extension authorities. This helps them understand climate change.

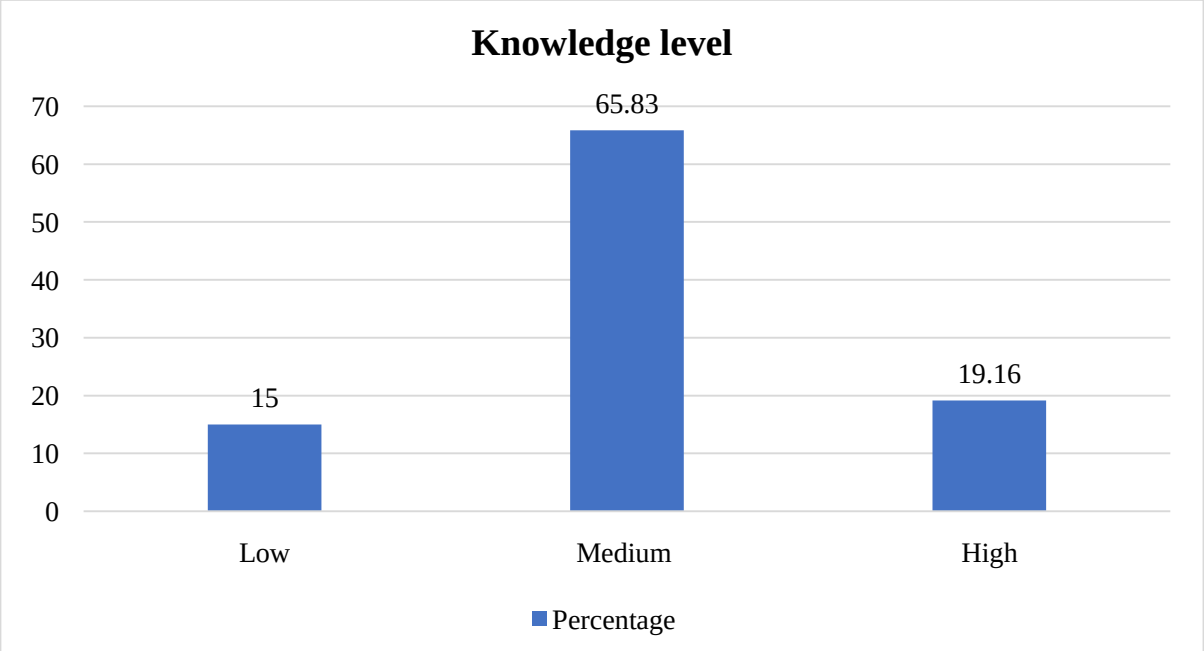

Figure 1. Distribution of respondent based on overall level of knowledge on climate change

Table 4 Association between selected independent variables with knowledge level of the farmers about climate change

S.No.	Independent Variable	Correlation coefficient
1.	Age	0.999*
2	Gender	0.260**
3	Caste	0.718*
4	Education	0.893*
5	Occupation	0.004 NS
6	Annual income	-0.027 NS
7	Marital status	-0.252 NS
8	Family Type	0.734*
9	House	0.659*
10	Farming Experience	0.275**
11	Sources of knowledge	0.853*
12	Economic motivation	0.960*

***; **; NS=/?????**

From this above Table 4, we can conclude that the independent variables namely age, caste, education, family type, house, sources of knowledge and economic motivation were positively and significantly correlated with knowledge level of the farmers about climate change at 0.01% of probability, Whereas the independent variables such as gender and farming experience was significantly correlated at 0.05% of probability. Therefore, the null hypothesis was rejected for these variables. The independent variables such as occupation was found to be non-significant, while annual income and marital status were found to be both negatively and non-significantly correlated with the knowledge of farmers at both 0.01% & 0.05% of probability respectively. Therefore, the null hypothesis was accepted for this variable.

CONCLUSION

The results of this study show that farmers are unaware of climate change and are just beginning to understand it. Most farmers have an average level of understanding of climate change. And because exposure is low, most farmers do not have full knowledge of climate change. They often rely on farmers for new information or continue to rely on the knowledge of their ancestors. The knowledge level of the farmers and a few chosen independent variables also showed a significant correlation. However, Additionally, the majority of farmers were unable to have mediumknowledge of climate change due to poor extension interaction.

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