



Research Article

STUDY ON FARMERS AWARENESS REGARDING CLIMATE CHANGE IN VIJAYAPUR DISTRICT OF NORTHERN KARNATAKA

JAMADAR RAVINDRA*, HALAKATTI S.V. AND CHANDRAKALA S.K.

Department of Agricultural Extension Education, University of Agricultural Sciences, Krishinagar, Dharwad, 580005, Karnataka, India

*Corresponding Author: Email - ravindra4184@gmail.com

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Abstract: An attempt has been made in this paper to study on Farmers awareness regarding climate change in the Bijapur district, of northern Dry Zone of Karnataka. Based on the existence of high range of variability in rainfall and temperature (since 40 years), in the district two taluks were selected as Vijayapur and Sindagi. From each of the selected taluks five villages were selected randomly. By applying simple random sampling technique 150 respondents were selected for the study. The Results revealed that with respect to awareness of climate change, more than one third of farmers had high level of awareness about climate change. It is evident from the studies that farmers are fairly aware of all the three important components of climate change which are prominently affecting agriculture viz., rainfall and temperature. More than one third of the farmers were highly aware of changes in temperature and overall impact of climate change on agriculture. It is really surprising to note that the probable reasons that could be attributed for higher awareness of farmers about climate change might be due to now-a-days farming is a costly venture. Most of the inputs required for agriculture are very costly.

Keywords: Awareness, Climate Change, Impact, Farmers, Inputs

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Introduction

Climate change is one of the biggest issues facing the world today. It is not a new phenomenon in the earth's history. Climate change refers to significant variation in either the mean state of the climate or in its variability persisting for an extended period, typically decades or longer. Studies indicate that the decade (1990-2000) across the globe recorded the warmest years during the past century, the three years, viz., 1997, 1998 and 1999 conditions were increasing in sequence. Summer, 2002 and 2003 were declared as warmest years during current century on record by national oceanic and atmospheric administration (NOAA), especially in the Asian subcontinent and in Europe, where the temperatures remained extremely high for long periods of time resulting in death of large number of human populations in Europe alone. There was, there is and there will be climate variability at global, regional, and local levels. Since, climate is closely related to human activities and economic activity including agricultural system naturally, there has to be serious concern about its stability.

Awareness on the climate change impacts is gaining more importance so in developing countries like India as variability in monsoonal rainfall as well as frequency of extreme weather events is on rise. Rainfall variability is the prime limiting factor for agricultural production in most of the areas but farmers from Raipur, Udaipur and Vijayapur chose the element of temperature also.

Materials and Methods

The study was conducted in Bijapur district of Karnataka during the year 2011-12. Bijapur district was purposively selected for the study, as it is "drought prone district". It covers five taluks viz., Bijapur, Basavan Bagewadi, Muddebihal, Indi, and Sindagi and these taluks come under Northern Dry Zone. In the present investigation, ex-post facto research design was employed. From each taluk five villages, and from each village, fifteen farmers were selected by applying simple random sampling. The villages selected were Bhutnal, Managooli, Hittinahalli, Ainapur and Rambapur from Bijapur taluk and Almel, Korhalli, Yaragall, Kerur and Rampur from Sindagi taluk. Thus, totally ten villages were selected for the study.

List of farmers from each of the ten selected villages was obtained. From each village, fifteen farmers were selected randomly. Thus the total sample for the study was 150 respondents. The details of respondents selected from various villages are given below. Taluks, villages and number of respondents selected for the study. Dependent variables: considering the objectives of the study farmers' awareness of climate change and farmers adaptations to climate change were considered as dependent variables. Independent variables: Independent variables that were supposed to influence the dependent variables were identified by discussion with scientists and reviews. The variables selected and the techniques employed for measurement are shown below.

Farmers awareness of climate change Climate change refers to any change in climate over time that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere in addition to natural climate variability observed over comparable time periods. In the present study an attempt has been made to investigate the awareness of farmers regarding climate change in the northern dry zone of Karnataka (Zone 3).

In this study farmers awareness of climate change is operationalised as the degree to which the farmers had information related to climate change (Rainfall and temperature) and its potential consequences in view of the importance of rainfall and temperature in the agriculture and farmers can easily understand the changes in rainfall and temperature. The awareness of farmers was assessed on these parameters of climate changes in the present study.

An item pool of awareness questions by consulting the department of meteorology, environmental sciences, Agronomists, department of soil science and chemistry, and other related department was prepared. Thorough scrutiny of the item pool was made with the help of field extension staff.

Finally, item which covered all aspects of climate change related to rainfall and temperature were selected. In all 36 items were collected administered to 50 judges selected from KVK, EEU, IGFR and KSDA to find out the relevancy of the statements in measuring the awareness of the farmers regarding climate change.

Finally, 15 statements, six statements related to rainfall, four statements related to temperature and five statements related to impact of climate change on agriculture were prepared separately and each statement was edited carefully to avoid ambiguity, and confusion in understanding the meaning intended. Awareness of the respondents was assessed in terms of temperature and rainfall over a period of time.

The respondents were asked to indicate their responses for each of the statements on two-point continuum of aware and not aware, at all with corresponding weightage of one and zero respectively to a set of statements related to conceptual and implication domains of climate change. The respondents were personally interviewed by the researcher with the help of a structured interview schedule. Data were analyzed using frequency, percentage, mean and standard deviation. The level of awareness was operationalized as the degree to which the farmers had information related to climate change and potential consequences. The adaptation level of people to the adverse impact of climate change depends upon their awareness level.

Awareness of farmers on changes in the precipitation

SN	Statements	Farmers Response	
		Aware	Not Aware
1	Increase in frost occurrence increase the scope of pests and diseases	1	0
2	Late onset of rains results in delayed farm operations and difficult to manage the crops	1	0
3	Heavy rainfall destroys irrigation water supply system	1	0
4	Heavy rainfall, drought and frost situation results in abnormal growth of crops	1	0
5	Low market price for poor quality of produce results due to unfavorable rainfall situation	1	0
6	Now a days there is change in the rainfall during crop growth period	1	0

Awareness of farmers on changes in the temperature

SN	Statements	Farmers Response	
		Aware	Not Aware
1	Now a days there is rise in both day and night temperature	1	0
2	Rise in temperature results in large scale migration and exodus of people and animals	1	0
3	Summer/winter is getting warmer	1	0
4	High temperature and relative humidity results in poor quality of the produce	1	0

The summated score was thus obtained from awareness of rainfall and temperature over the last 40 years *i.e.*, (1971-2011) as awareness score of an individual respondent. The total score range was worked out. These score were further categorized as high awareness, medium awareness and low awareness categories based on mean and standard deviation.

Results

Awareness of farmers about changes in the precipitation The level of awareness was operationalized as the degree to which the farmers had information related to climate change and potential consequences. The adaptation level of people to the adverse impact of climate change depends upon their awareness level. In this context the farmers were interviewed to know whether they were aware of any changes in the climate on major aspects of rainfall over a period by using structured schedule. The results presented in [Table-1] described below. Data with respect to awareness of farmers about changes in the rainfall is presented over the last forty years (1971-2011).

A cursory look at the [Table-1] revealed that, about 50.00 per cent of the farmers were aware, regarding information on Increase in frost occurrence increases the scope of pest and diseases. Similarly in case of the late onset of rains, results in

delayed farm operations and difficult to manage the crops, 62.66 per cent of the farmers were not aware whereas, 37.33 per cent of the respondents were aware. In case of Heavy rainfall destroys irrigation water supply system.

Majority (84.00%) of the respondents were not aware, whereas only less proportion 16.00 per cent of the respondents were aware of it. Further it was observed that majority (84.00%) of the farmers not aware of the heavy rainfall, drought and frost situations, results in abnormal growth of crops/low productivity, followed by 16.00 per cent of the respondents were aware of it. It could be observed from the [Table-1] that majority 91 per cent of the farmers were not aware of the low market price for poor quality of the produce result due to unfavorable rainfall situations, while 9.33 per cent of the respondents aware of it. Regarding information about change in the rainfall during the crop growth period majority 90.00 per cent of the respondents were not aware, whereas, 10.00 per cent of the respondents were aware.

Overall awareness of farmers about changes in the precipitation [Table-1], clearly indicates that 40.00 per cent of the farmers had low level of awareness followed by high (36%) and medium (24%) level of awareness.

Awareness of farmers about changes in the temperature

Awareness of farmers about changes in the temperature was presented over the last forty years. The data presented in the [Table-1] revealed that, majority (57.35%) of the farmers were unaware of the statement that now a day's rise in both day and night temperature. While 42.66 per cent of them opined were aware of it. With regard to the statement rise in temperature results in large scale migration and exodus of people and animals. It is interesting to note that chunk of the (76.67%) respondents were not aware. Majority of the farmers (71.34%) were not aware of summer and winter is getting warmer whereas 28.66 per cent were aware of it. It can be clearly seen from the [Table-1] shows that 76.67 per cent of the respondents were not aware of the statement that high temperature and relative humidity results in poor quality of the produce 4.5.1. Overall awareness of farmers about changes in the temperature classification of farmers based on awareness of farmers regarding changes in the temperature was depicted in the [Table-2] shows that more than half of the farmers (58.00%) had low level of awareness followed by high (32.66%) and medium (9.33%) level of awareness.

Awareness of the farmers about impact of climate change in general, agriculture is greatly affected by climate change, hence it is important to ascertain the farmers' awareness about consequences of climate change on agriculture.

The data presented in the [Table-3] depicts that, all the farmers opined there was an increase in the soil erosion, increased expenditure on input like seeds, chemical, labors, increased heavy lodging and uprooting of crops, increase in insect problems, and loss in the income from agriculture. Regarding awareness about the statement Stronger wind and heavy rainfall increases soil erosion, majority (43.33%) of the respondents are aware of it. In case of because of climate change, there is increase in operational cost due to increased expenditure on inputs statement chunk (69.34%) of the respondents were not aware, followed by 30.66 per cent of the respondents were aware of it.

Regarding awareness about strong wind and storms result in heavy lodging and uprooting of crops about 70.00 per cent of the respondents were not aware, 30.00 per cent was aware of it. Investigation further revealed that 83.34 per cent of the respondents were not aware with respective statement, high rainfall and relative humidity results in increased insect problems. Whereas only less proportion 16.66 were aware of in case of income from agriculture is adversely affected due to climate change, Majority (86%) of the farmers were not aware, whereas only 14.00 per cent of the respondents were aware of it. Classification of farmers based on overall impact of climate change on agriculture was depicted in the [Table-4], revealed that 48.00 per cent of farmers had low level of awareness followed by high (35.33%) and medium (16.00%) level of awareness.

Discussion

Awareness of farmers about changes in climate

A series of questions were asked to study the awareness of farmers regarding climate change with respect to rainfall, temperature and overall impact on agriculture. The results are presented in [Table-1, 2, 3 and 4].

Table-1 Awareness of farmers about changes in temperature (n=150)

SN	Statements	Aware		Not Aware	
		Frequency	Percentage	Frequency	Percentage
1	Now a days there is rise in both day and night temperature	64	42.66	86	57.35
2	Rise in temperature results in large scale migration and exodus of people and animals	35	23.33	115	76.67
3	Summer/winter is getting warmer	43	28.66	107	71.34
4	High temperature and relative humidity results in poor quality of the produce	35	23.33	115	76.67

Table-2 Distribution of farmers according to changes in temperature (n=150)

1	Categories	Frequency	Percentage
2	Low awareness (<5.99)	49	58
3	Medium awareness (5.99-7.14)	14	9.33
4	High Awareness (>7.14)	87	32.66
	Mean=6.57 SD=1.35		

Table-3 Awareness of farmers about impact of climate change on agriculture (n=150)

SN	Awareness statements on impact of climate change	Aware		Not aware	
		Frequency	Percentage	Frequency	Percentage
1	Stronger wind and heavy rainfall increases soil erosion	65	43.33	65	56.67
2	As a result of climate change, there is increase operational cost due to increased expenditure on inputs	46	30.66	104	69.34
3	Strong wind and storms result in heavy lodging and uprooting of crops	46	30.66	104	69.34
4	High rainfall and relative humidity result in increased insect problems	25	16.66	125	83.34
5	Income from agriculture is adversely affected due to climate change	21	14	129	86

Table-4 Overall impact of climate change on agriculture (n=150)

SN	Awareness categories	Frequency	Percentage
1	Low (<7.17)	53	48.66
2	Medium (7.17-9.26)	24	16
3	High (>9.26)	73	35.33
	Mean= 8.21	SD=2.46	

It is evident from the tables that farmers are aware of all the three important components of climate change which are prominently affecting agriculture viz., rainfall, temperature, and overall impact on agriculture. Thirty-six per cent of the farmers are highly aware of changes in precipitation. More than one third of the farmers were highly aware of changes in temperature and overall impact of climate change on agriculture. It is surprising to note that more than one third of the farmers were aware of climate change. The probable reasons that could be attributed for higher awareness of farmers about climate change might be due to now-a-days farming is a costly venture. Most of the inputs required for agriculture are very costly. Due to industrialization, the labor force is also becoming scarce and costly. The agriculture situation in the study area is mainly dependent on rainfall. Therefore, the farmers might have gathered as much information as possible from various individual and mass media. Thereby their awareness of changes in climate change has been good. The present findings are in line with Madison (2006) [1], Araya and Adjaye (2001) [2], Anim (1999) [3].

Conclusion

The present study is an attempt to analyze the farmers' awareness of climate change and their adaptation in comprehensive way. This study can be taken up in the district in order to get a comprehensive picture about climate change and its impact on agriculture. In depth analysis of the constraints expressed by the farmers can be taken up to find out practical solutions for each problem. A study can be conducted to know the opinion of the farmers about introduction of highly advanced technologies to mitigate the ill effects of climate change in the district.

Application of research: Study on farmers awareness regarding climate change in Vijayapur District

Research Category: Agricultural Extension Education

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Cultivar / Variety / Breed name: Nil

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Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
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