Research Article

PERCEPTION OF DRYLAND FARMERS ON CLIMATE CHANGE IN VIRUDHUNAGAR DISTRICT OF TAMIL NADU

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Abstract: Dryland agriculture is facing serious effects due to climate change. World countries spending money and working to mitigate climate change effects. Farmers who depend on environment especially Dryland farmers are facing strong impacts due to these effects. A descriptive study was chosen to understand perception of farmers of Dryland region towards climate change. 120 farmers were selected randomly and the selection of district and taluk was purposeful. Pre-structured and pre-tested interview schedule were used for data collection. The results revealed that farmers strongly perceive the climate change and its effects. They strongly agreed with the presence of climate change and perceiving that reasons for poor production and productivity also a climate change effect. And the respondents believing that through proper IFS, INM and SWC practices we can mitigate the effect of climate change and restore the lost resources. This study concluded with these understanding perceptions would help to better programme planning, policy making, etc. on climate change mitigation.

Keywords: Climate change, Perception, Mitigation, Effects, Dryland

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Introduction

The threat of this millennium is climate change, since it affects the environment and socio-economic life of the people who depend on environment. India is facing series of flood, drought and unusual seasonal change over past decades. Climate change projections made up to 2100 for India indicate an overall increase in temperature by 2-40C with no substantial change in precipitation. Therefore, climate change issue should be addressed as soon as possible for the better livelihood of farmers. Climate change refers to any change in climate over time, that may be due to natural variability or as a resultant effect of human activity (IPCC). Farmers engaged in Dryland agriculture receiving maximum effects of climate change. Their dependency on environmental, atmospheric factors like rainfall, heat waves, etc. makes victims of climate change. Even after the increased area under irrigation about 85 percent of coarse cereals, 83 percent in pulses, 42 percent in rice, 70 percent in oilseeds and 65 percent in cotton are still cultivated as rainfed. Dryland crops like cotton, maize, pulses, etc. are badly affected due to climate change and its environmental impacts. Climate change is likely to impact biodiversity in rainfed regions significantly. This impact will be complex with differential responses between interacting species, such as, crop, pest and pathogen. Certain genotypes may be preferred over others. This may lead to loss of useful gene pool and hence ex-situ conservation in identifying hot spots becomes important [1]. Perception of the Dryland farmers towards climate change has to be studied in order to develop and disseminate technologies for getting resilience in farming. An attempt was made to understand the perception of farmers of Dryland region on climate change.

Materials and Methods

Sample of 120 farmers from Dryland region of Virudhunagar district of Tamil Nadu was selected randomly. The study aimed at describing the Dryland farmer's mentally on climate change, so Descriptive Research Design was chosen.

The selection of study area is purposeful. The data was collected using pre-structured and pre-tested interview schedule with appropriate questions on perception towards climate change. Likert's five-point scale has been used for measuring perception and its degree was computed using statistical tools like frequency, percentage, mean, standard deviation and Z-test [2].

Statistics

The data was further analyzed for testing the significant effects of the parameters under study [3].

Frequency

Frequency is the number of occurrences of a particular event. Statistically, frequency (fi) of an event i is the number ni of times the event occurred in the experiment or the study.

Percentages

For making comparisons, percentages were used in descriptive analysis. Percentages are calculated by multiplying 100 with the frequency of a particular cell and dividing by the total number of respondents in that particular cell.

$$Percentage = \frac{Frequency}{Total\ number\ of\ respondents} \times 100$$

Arithmetic Mean (A.M)

The mean is the epitomized value arrived by dividing the sum of observations by the total number of observations.

$$X = \frac{\sum Xi}{N}$$

Where,

Xi = Observation Score

N = Total number of observations

X = Mean Score

Standard Deviation (S.D.)

The square root of the mean of the squared deviations of individual values from their mean is standard deviation of that set of values. The formula used for standard deviation was as below

$$S.D. = \frac{\sqrt{\sum (Xi - X)^2}}{N}$$

Where,

S.D. = Standard deviation
$\sum$ = Sum
Xi = Individual score
X = Mean of sample
N = Total no. of respondents

Z-test

Z-test was applied to compare the degree of responses given by the sampled respondents with respect to climate change and climate resilient practices. The mathematical form of Z test is given below:

$$Z = \frac{\bar{X} - \mu 0}{\sigma / \sqrt{n}}$$

Where,

$\bar{X}$ = Mean Score
μo = Population Mean
σ = Standard Deviation
$\sqrt{n}$ = No. of Respondents

Results and Discussion

Distribution of Respondents on their responses to perception statements on Climate Change

Responses were recorded for analyzing perception of dryland farmers towards climate change. It was found that for statements like, "Change in temperature is felt during the last few years" "Frequency of drought is high in past few years" "Climate change is the reason for low production and productivity of crops" "IFS, NRM, SWC practices would help to mitigate and adopt climate change" received more frequency of Strongly Agree response. And for the remaining statements their responses are received in all five categories. The distributions of responses are presented in the below [Table-1] [4-8].

Table-1 Distribution of Respondents on their responses to perception statements on Climate Change

S N	Statements	Responses				
		SA	A	UN	D	SD
1	Change in temperature is felt during the last few years.	90 (75)	23 (19.17)	7 (5.83)	0 (0)	0 (0)
2	Existence of climate change might be myth.	0 (0)	4 (3.33)	21 (17.5)	74 (61.67)	21 (17.5)
3	Frequency of drought is high in past few years.	106 (88.33)	14 (11.67)	0 (0)	0 (0)	0 (0)
4	Climate change is a natural process not a human made implication.	11 (9.17)	16 (13.33)	46 (38.33)	28 (2.33)	19 (15.83)
5	Climate change is the reason for low production and productivity of crops.	107 (89.17)	13 (10.83)	0 (0)	0 (0)	0 (0)
6	Effects of climate change cannot be fixed through human efforts.	9 (7.50)	59 (49.17)	42 (35)	9 (7.50)	2 (1.66)
7	IFS, NRM, SWC practices would help to mitigate and adopt climate change.	96 (80)	13 (10.83)	11 (9.17)	0 (0)	0 (0)
8	Climate change is due to curse of God.	9 (7.50)	20 (16.67)	84 (70.00)	5 (4.17)	2 (1.66)

SA = Strongly Agree, A = Agree, UN = Undecided, D = Disagree
SD = Strongly Disagree

Degree of perception on climate change by the farmers of Dryland region

The mean, standard deviation and Z-value of the statements [Table-2]. Statements like "Climate change is a natural process not a human made implication" and "Climate change is due to curse of God" found no significant at 0.05% level significance, which elicits that there is no clear response from the respondents. "Existence of climate change might be myth" statement's Z-value (-8.2) shows that there is negatively significant degree of responses received, that shows the respondents strongly disagree this above-mentioned statement. "Change in temperature is felt during the last few years" "Frequency of drought is high in past few years" "Climate change is the reason for low production and productivity of crops" "Effects of climate change cannot be fixed through human efforts" and "IFS, NRM, SWC practices would help to mitigate and adopt climate change" received positively significant degree of responses at 0.05% level of significance, which explains majority of the respondents were agreed with the above statements.

Table-2 Degree of responses on climate change by the farmers

S N	Statements	Mean	S.D.	Z – Value
1	Change in temperature is felt during the last few years.	4.69	2.15	8.6*
2	Existence of climate change might be myth.	2.06	1.256	-8.2*
3	Frequency of drought is high in past few years.	4.88	1.572	13.15*
4	Climate change is a natural process not a human made implication.	2.76	2.108	-1.26[NS]
5	Climate change is the reason for low production and productivity of crops.	4.89	1.522	13.6*
6	Effects of climate change cannot be fixed through human efforts.	3.56	2.3	2.67*
7	IFS, NRM, SWC practices would help to mitigate and adopt climate change.	4.71	2.047	9.14*
8	Climate change is due to curse of God.	3.24	1.79	1.5[NS]

*= Significant at 0.05% NS= No Significant

Conclusion

The perception of Dryland farmers towards climate change need to be understood by all researchers, teachers, programme planners, policy makers, etc. for better performing their roles. The results strongly reveal that there is strong degree of perception on climate change. The respondents are strongly believed that reason for the low production and productivity of crops is climate change. They also perceived that climate change is not myth. So, the conclusion is perceiving climate change as the reason for low production and productivity and they also believes that impacts of climate change can be fixed through proper Soil and water conservation, Integrated Nutrient Management and Integrated Farming systems.

Application of research: This research can be applied to frame better policy initiatives and programme planning from government, NGOs, Private social organizations, etc. for the benefit of farmers of Dryland region.

Abbreviations:

IFS = Integrated Farming System
INM= Integrated Nutrient Management
SWC= Soil and Water Conservation
IIPC= Intergovernmental Panel on Climate Change
NGO= Non-Government Organisation

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