International Archive of Applied Sciences and Technology
Int. Arch. App. Sci. Technol; Vol 10 [3] September 2019 : 87-91

[ISO9001: 2008 Certified Organization]
www.soeagra.com/iaast.html

IAAST
ONLINE ISSN 2277- 1565
PRINT ISSN 0976 - 4828

CODEN: IAASCA ORIGINAL ARTICLE

DOI: .10.15515/iaast.0976-4828.10.3.8791

Farmer's Attitude towards effects of Climate Change and Climate Resilient Practices in Virudhunagar District of Tamil Nadu

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ABSTRACT
Change in climate has been perceived with more emphasis from the beginning of the 21st century. Since its effects causes direct effects on ecosystem and agriculture especially farmers of dryland regions, a descriptive research study has been conducted in order to understand the farmers' attitude towards climate change effects and climate resilient practices in Dryland district (Virudhunagar) of Tamil Nadu. Sivakasi taluk and Virudhunagar district were selected purposefully because the region falls on under dryland farming. 120 respondents were selected randomly from 10 randomly selected villages of selected taluk and pretested interview schedule has been used for collecting responses. The results of the study revealed that 63.33% of the respondents were having medium level attitude towards climate change effects followed by high (25.83%) and low (10.83%) respectively. And it further revealed that 47.7% of the respondents were having medium level attitude towards climate resilient practices followed by low (44.17%) and high (8.33%) respectively. From the above findings this is concluded that effect of climate change had been understood by the respondents in medium level similarly regarding climate resilient practices also respondents were having medium level favourable attitude even though they had not exposed much towards climate resilient practices. Hence the findings of this research may help extension agencies for better implementation and training of climate resilient practices of National Initiative on Climate Resilient Agriculture (NICRA).
Key Words: Climate Change, Dryland, Climate Resilient Practices, NICRA.

Received 22.03.2019 Revised 23.04.2019 Accepted 02.05.2019

CITATION OF THIS ARTICLE
Alagu Niranjan D and D Kumar Bose. Farmer's Attitude towards effects of Climate Change and Climate Resilient Practices in Virudhunagar District of Tamil Nadu. Int. Arch. App. Sci. Technol; Vol 10 [3] September 2019 : 87-91

INTRODUCTION

Ecosystem is more vulnerable for the effects of climate change. Farmers are the professionals' totally engaging on ecosystem for their livelihood activities, especially farmers of dryland region. Out of 141 million hectares of cultivated land in India, 80 million hectares are rainfed and dryland which contributes 40% of food grain production and 2/3rd of the livestock forage production has being done [3]. The above facts directly depict the dependency and importance of dryland agriculture in Indian economy. The effects of climate change have been classified as environmental effects, economic effects and social effects [5]. Under environment, sea level rise, cyclones, floods, heat waves, droughts, loss of biodiversity, forest fires, unseasonal rainfall and increase in surface temperature are the major effects. Effect on production, productivity, diseases on livestock, income and employment are those effects leads to economic loss for farmers. Social effects are public health, food security, employment, income, livelihood, gender, education, housing, poverty and migration which are less perceived earlier and now more researches are being conducted in social effects of climate change [6-13]. In order to find permanent solution to

the above listed effects of climate change, Indian Council of Agricultural Research (ICAR) came up with a project called National Innovations on Climate Resilient Agriculture (NICRA) in February 2011 with the objective of long term strategic research for the adaptation of crops, livestock, natural resource management and possible institutional interventions to mitigate climate change and its effects. Natural resource management is the systematic management of natural resources like, land, water, soil, etc. The climate resilient Natural resource management practices as mentioned by the NICRA are in-situ moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage in flood prone areas, conservation tillage where appropriate, artificial ground water recharge and water saving irrigation methods. Climate resilient crop production practices are introducing drought/temperature tolerant varieties, advancement of planting dates of rabi crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in horticulture through fumigation, community nurseries for delayed monsoon, custom hiring centres for timely planting, location specific intercropping systems with high sustainable yield index. Climate resilient livestock management practices as listed by NICRA are use of community lands for fodder production during droughts/floods, improved fodder/feed storage methods, preventive vaccination, improved shelters for reducing heat stress in livestock, management of fish ponds/tanks during water scarcity and excess water, etc. Interventions like seed bank, fodder bank, commodity groups, custom hiring centre, collective marketing, and introduction of weather index based insurance and climate literacy through a village level weather station are considered as climate resilient institutional interventions [13].

MATERIAL AND METHODS

The Tamil Nadu has seven agro-climatic zones, out of which southern zone has the average rainfall of 857 mm where dryland agriculture is common. A descriptive study was conducted in Sivakasi taluk of Virudhunagar district which falls under southern zone where the annual average rainfall of the districts 829mm [2]. The district has been chosen purposefully in order to find out the effect of climate change and climate resilient practices on farmers of dryland region without much extension intervention, since; the selected district is not falls under NICRA national demonstration districts list. There are 41 villages in Sivakasi taluk 8 villages are selected randomly and from each village around 15 farmers were selected randomly to make the sample size of 120. The primary data was collected using structured and pre tested interview schedule from the respondents. The measurement items were carefully selected with reference to Edwards 14 principles for the selection of items [4]. The responses were measured using five point continuum scale and levels of attitude were calculated from the overall responses scores. Frequency, percentage, arithmetic mean and range are used to compute the result values.

RESULTS AND DISCUSSION

This part of the paper discusses the results that arrive from the analysis of the data.

Table: 1 Distribution of respondents based on their attitude towards climate change effects

S. No.	Statements	Responses				
		SA	A	UN	D	SD
1.	Climate change is reason for the change in rainfall pattern, rise in temperature, heat waves and other environmental effects.	95 (79.17)	25 (20.83)	0 (0)	0 (0)	0 (0)
2.	Food security, income and employment of villagers are disturbed due to climate change	18 (15)	95 (79.17)	7 (5.83)	0 (0)	0 (0)
3.	Climate change is not reason for low production and productivity of crops.	0 (0)	0 (0)	7 (5.83)	12 (10)	101 (84.17)
4.	There is no much climate change effects on livestock	0 (0)	0 (0)	49 (40.83)	41 (34.17)	30 (25)
6.	Climate change is the cause for uneven distribution of rainfall inside a district.	89 (74.16)	23 (19.17)	8 (6.67)	0 (0)	0 (0)
7.	Family's migration from farming is high as a result of climate change.	16 (13.33)	55 (45.83)	50 (41.67)	0 (0)	0 (0)
8.	There is no crop failure due to climate change effects.	0 (0)	0 (0)	7 (5.83)	56 (46.67)	57 (47.5)

Parenthesis shows in percentage

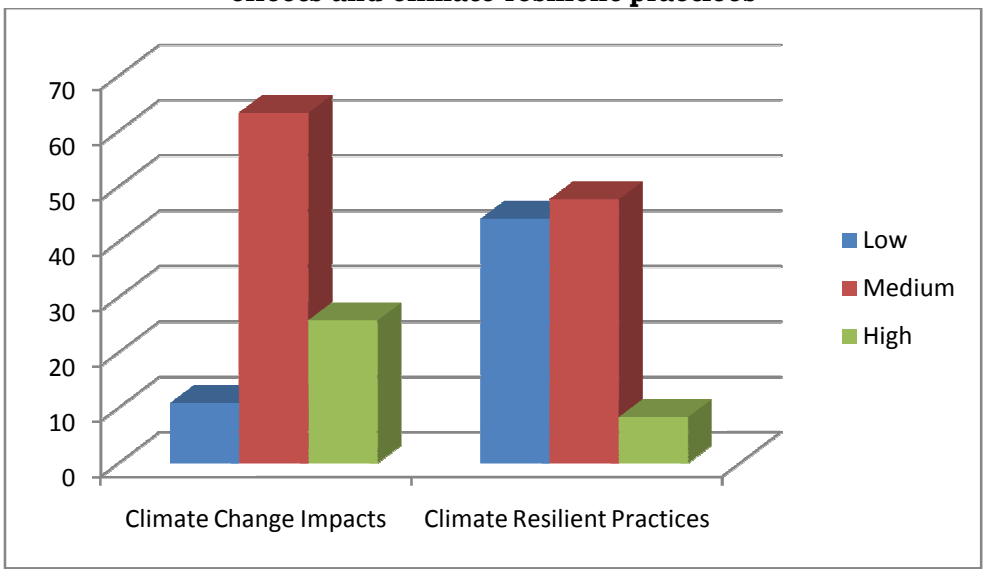
The table: 1 describes the statements used for measuring the attitude of farmers towards climate change effects and the frequency and percentage of responses for the concerned statements. Eight statements are divided into positive and negative statements in order to measure attitude in an effective way. Statements had all three effect dimensions of climate viz, social, economical and environmental. The responses were collected in five point continuum viz, strongly agree, agree, undecided, disagree and strongly disagree.
From the above table and statements 1 and 2 it was found that social, environmental, economical impact of climate change was perceived by the respondents.

Table: 2 Distribution of respondents based on their attitude towards climate change effects

S. No.	Attitude level (Scores)	Frequency	Percentage
1.	Low (35-39)	13	10.83
2.	Medium (40-43)	76	63.33
3.	High (44-48)	31	25.83
Total		120	100.00

The above table presents the distribution of respondents based on their attitude level of climate change effects. 63.33% of the respondents are having medium level attitude followed by high (25.83%) and low (10.83%) respectively. The results reveal that majority of the respondents having medium level favourable attitude towards climate change effects.

Figure: 1 Distribution of respondents based on their attitude level of climate change, effects and climate resilient practices



The bar diagram explains the distribution of respondents based on their attitude level of climate change, effects and climate resilient practices. The table: 3 depicts the statements and their responses that measures attitude of respondents towards climate resilient practices. The climate resilient practices used are soil and water conservation practices, agroforestry practices, integrated farming system, changing cropping pattern, seed treatment, KCL spray, water spray, rainwater harvesting and proper vaccination and giving more water to livestock. Terminologies related to climate resilient practices are communicated in local language to the respondents in order to facilitate easy understanding. The responses were collected in five point continuum viz, strongly agree, agree, undecided, disagree and strongly disagree. Soil and water conservation practices were widely practiced by the farmers so the statement related to that got good response. More technical aspects like KCL spray, agroforestry and IFS fetched undecided response because of its complicated nature.

Table: 3 Distribution of respondents based on their attitude towards climate resilient practices

S. No.	Statements	Responses				
		SA	A	UN	D	SD
1.	Soil and water conservation technique increases water availability for crops	49 (40.83)	63 (52.2)	8 (6.67)	0 (0)	0 (0)
2.	Climate resilient technologies cannot be adopted easily	3 (2.5)	68 (56.67)	41 (34.17)	8 (6.67)	0 (0)
3.	Agroforestry, IFS and changes in cropping pattern would help to minimize the effect of climate change.	0 (0)	9 (7.5)	111 (92.5)	0 (0)	0 (0)
5.	Seed treatment, KCL, Water spray would improve the life of crops under moisture stress.	9 (7.5)	7 (5.83)	108 (90)	0 (0)	0 (0)
6.	Proper vaccination and giving more water to livestock will keep them away from diseases.	107 (89.17)	13 (10.83)	0 (0)	0 (0)	0 (0)
7.	No technology will help to regain the lost environment	7 (5.83)	60 (50)	42 (35)	11 (9.17)	0 (0)
8.	Water harvesting structures in the farm increases the water availability duration	21 (17.5)	99 (82.5)	0 (0)	0 (0)	0 (0)
9.	Integrating farm businesses will not help to mitigate climate change	0 (0)	9 (7.5)	101 (84.17)	10 (8.33)	0 (0)

Parenthesis shows in percentage

Table: 4 Distribution of respondents based on their attitude level toward climate resilient practices

S. No.	Attitude level (Scores)	Frequency	Percentage
1.	Low (29-32)	53	44.17
2.	Medium (33-36)	57	47.70
3.	High (37-40)	10	8.33
Total		120	100.00

The above table shows the distribution of respondents based on their attitude level of climate resilient practices. 47.7% of the respondents are having medium level attitude followed by low (44.17%) and high (8.33%) respectively. The result reveals that majority of the respondents (47.70%) had medium favourable attitude towards climate resilient practices.

CONCLUSION

From the above results it is understandable that, majority of the respondents (63.33%) were having medium favourable attitude towards climate change effects and 47.70 per cent of the respondents were had medium level of favorable attitude towards climate resilient practices. In the light of above findings it is concluded that climate change, its effects and climate resilient practices were not perceived by the farmers properly. Even though medium level favourable attitude is giving hope for the extension professionals for better implementation of climate change based programmes to the farmers of dryland region.

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