

Awareness of Farmers Regarding Climate Change

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ABSTRACT

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. Total annual crop losses in the world agriculture are mainly due to direct weather impacts. The present study was conducted in Latur district of Marathwada region of Maharashtra state. From this district two tehsils near to district place were considered for the study. Four villages from each tehsils were selected randomly. Ten farmers from each village who were using mobile phone services were purposively selected. Thus, total 80 famers were the sample of present study. The major objective of this study was to study the awareness of farmers regarding climate change and to know the relationship between profile of the farmer and awareness regarding climate change. After analyzing the data, it was observed that half (50.00%) of the farmers were in medium category of awareness about climate change. The next result was that age, education, farming experience, occupation, knowledge of crop insurance, extension contact and risk orientation are positive and highly significant with awareness of farmers regarding climate change.

Keywords: Awareness, Climate change

INTRODUCATION

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 is the change in our weather patterns that are occurring because of an increase in the earth's average temperature. 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.

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. Total annual crop losses in the world agriculture are mainly due to direct weather impacts. Increase in atmospheric carbon dioxide (CO₂) and other greenhouse gases viz. methane (CH₄), nitrous oxide (N₂O) and chlorofluorocarbons (CFC) due to fossil fuel burning, rapid industrialization and deforestation create a layer in the atmosphere and prevent the long wave radiation emitted by earth which otherwise would have escaped to space. As a result the average global temperatures are increasing. Increase in global temperature results in changes in the general circulation and there by climate change. Agriculture sector reveals high sensitivity and resilience to climate change.

Today, Climate change has been recognized globally as the most pressing critical issue affecting the mankind survival in the 21st century. No one can deny it any longer. You can feel it in heat, you can see it in ice and you can observe it in storms. Climate change without doubt became the critical environmental issue of present decade. While the policy makers, academicians and activists are engaged



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in mounting debate about North-South divide over sharing the major responsibility for factors leading to climate change, scientists have given a clarion call for adoption of local action of corrective measures at once to save the planet from catastrophe.

Climate change impacts and associated vulnerability are of particular concern to developing countries, where large parts of the population depend on climate sensitive sectors like agriculture and forestry for livelihood. By adversely affecting freshwater availability and quality, biodiversity and desertification, climate change tends to disproportionately affect the poorest in the society, exacerbating inequities in access to food, water and health (Maddison 2007).

Effect of climate change on Agriculture:

• Animal and Fish: Due to high temperature there is change in life cycles and migration of animals and fish.

The result of increasing heat stroke there is also increase in the heat related illness and also causes high mortality rate.

• **Crop yield:** Crop yield is reduces due to changing climatic pattern i.e. draught condition, heatstroke etc.

Yield loss is about 60%.

- Seed quality& Nutritional quality: Seed Stronger storms and rain causes damages to crop. Also causes falling of fruits and flowers. Qualities like germination %, purity reduces. Nutritional qualities like protein content, oil% decreases.
- Increasing Pest and disease attack: Due to increase in relative humidity pest and disease attack is increases. And causes yield loss about 30%.
- Crop damage from extreme heat: Due to heat waves there is moisture stress in the field crop at their critical growth stages.

Because of moisture stress there is loss in the yield about 60%.

- Stronger storms and rains: Stronger storms and rain causes damages to crop. Also causes falling of fruits and flowers.
- Waterlogged lands: High rainfall causes the water logging condition which is unsuitable for cultivation.
- **Increased drought:** Drought causes water scarcity. Also causes water stress due to this yield decreases up 60%.
- **Increased weed:** Due to climate change there is increase the weed population. Weed causes about 69% yield losses.

Climate change risk in Marathwada region of Maharashtra

The Marathwada region of Maharashtra is just coming out of the worst drought in 40 years. While the drought of the magnitude in 2016 will always bring hardship to local people which causes the effects of extreme weather on local livelihood. The district of Marathwada witnessing maximum farmers suicides in Maharashtra face higher risk to climate change. According to the Central Research Institute for Dry land Farming, the districts in Marathwada face very high risk to climate change.

Significance of the study

Agriculture is the most important sector of the economy in India provides food and livelihood security to



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much of the Indian population. It plays a crucial role in the country's development contributing 16 per cent of India's Gross Domestic Product (GDP). Climate is one of the key components influencing agricultural production and has large-scale impacts on food production and overall economy.

Agriculture in India suffers a lot from erratic weather patterns such as heat stress, longer dry seasons and uncertain rainfall, since about 65 per cent of the 5 cultivated areas fully depends on monsoon rainfall. Declined yield due to unfavorable weather and climate will lead to vulnerability in the form of food insecurity, hunger and shorter life expectancies. There are some impacts for which adaptation is the only available and appropriate response.

India demonstrates diverse geo-physical and climatic conditions within relatively small areas. It is, therefore, an ideal place to study climate change impacts on natural and socio-economic spheres. Such a study would contribute towards a better understanding of the intensity and impacts of global changes. Studies on awareness, perceptions, local knowledge, and adaptive strategies at the household and community levels, as well as lessons learned, can provide the basis for concepts and methods of assessing climate change impacts, vulnerability, and adaptation activities of the local farmers. In this context the present research seeks to investigate impacts of climate change on agriculture and adaptation activities carried out by the local people. Based on the case of the local peoples of Marathwada region, this investigation intends to capture the extent of local people's awareness regarding climate change with following objectives.

OBJECTIVES

- 1. To study the profile of farmers
- 2. To study the awareness of farmers regarding climate change
- 3. To study the relationship between profile and awareness of farmers regarding climate change

METHODOLOGY

The present study was conducted in Latur district of Marathwada region of Maharashtra state. From this district two tehsils near to district place were considered for the study. Four villages from each tehsils were selected randomly. Ten farmers from each village who were using mobile phone services were purposively selected. Thus, total 80 famers were the sample of present study. An interview schedule was prepared, so as to collect the information in line with the objectives of the study. The data was collected personally with the help of interview schedule. The data were analyzed with the help of statistical tools like frequency, percentage, mean, standard deviation.

RESULTS

1. Profile of farmers

 Table 1: Distribution of respondents according to their profile

| SI. No. | Categories | Frequency | Percentage (%) | | |
|-----------|--------------------------|-----------|----------------|--|--|
| Age | | | | | |
| 1. | Young (upto 25 years) | 14 | 17.50 | | |
| 2. | Middle (26 to 45 years) | 42 | 52.50 | | |
| 3. | Old (46 and above years) | 24 | 30.00 | | |
| Education | | | | | |
| 1. | Illiterate | 02 | 02.50 | | |



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| 2. | Can read only | 00 | 00.00 | | |
|---------------|----------------------------------|----|-------|--|--|
| 3. | Can read and write | 00 | 00.00 | | |
| 4. | Primary school | 04 | 05.00 | | |
| 5. | Middle School | 00 | 00.00 | | |
| 6. | High school | 34 | 42.50 | | |
| 7. | College level | 40 | 50.00 | | |
| Farm | ing experience | | | | |
| 1. | Low (upto 7 years) | 20 | 25.00 | | |
| 2. | Medium (8 to 27 years) | 38 | 47.50 | | |
| 3. | High (28 and above years) | 22 | 27.50 | | |
| Occup | pation | | | | |
| 1. | Farming + Labour | 20 | 25.00 | | |
| 2. | Farming + Service | 36 | 45.00 | | |
| 3. | Farmers | 24 | 30.00 | | |
| Land | holding | | | | |
| 1. | Marginal (upto 1 ha.) | 8 | 10.00 | | |
| 2. | Small (1.01 to 2.00 ha.) | 42 | 52.50 | | |
| 3. | Medium (2.01 to 4.00 ha.) | 10 | 12.50 | | |
| 4. | Semi-medium (4.01 to 10.00 ha.) | 18 | 22.50 | | |
| 5. | Big (10.01 and above ha.) | 02 | 02.50 | | |
| Cropp | oing pattern | | | | |
| 1. | Low (upto 2 crops) | 32 | 40.00 | | |
| 2. | Medium (3 to 4 crops) | 40 | 50.00 | | |
| 3. | High (5 and above crops) | 08 | 10.00 | | |
| Irriga | tion facilities | | | | |
| 1. | River | 00 | 00.00 | | |
| 2. | Pond | 00 | 00.00 | | |
| 3. | Well | 10 | 12.50 | | |
| 4. | Borewell | 40 | 50.00 | | |
| 5. | Farm pond | 00 | 00.00 | | |
| 6. | Dam | 00 | 00.00 | | |
| 7. | Canal | 00 | 00.00 | | |
| 8. | Bore and well | 22 | 27.50 | | |
| 9. | No irrigation | 08 | 10.00 | | |
| Annual Income | | | | | |
| 1. | Low (Up to Rs. 45,000) | 12 | 15.00 | | |
| 2. | Medium (Rs. 45,001 to 1,00,000) | 46 | 57.50 | | |
| 3. | High (Rs. 1,00,001 and above) | 22 | 27.50 | | |
| Know | ledge of Crop insurance | | | | |
| 1. | Low (up to 5) | 20 | 25.00 | | |
| 2. | Medium (6 to 7) | 44 | 55.00 | | |
| 3. | High (above 7) | 16 | 20.00 | | |



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| Extension contact | | | | |
|-------------------|---------------------|----|-------|--|
| 1. | Low (up to 15) | 18 | 22.50 | |
| 2. | Medium (16 to 20) | 44 | 55.00 | |
| 3. | High (21 and above) | 18 | 22.50 | |
| Risk orientation | | | | |
| 1. | Low (up to 23) | 22 | 27.50 | |
| 2. | Medium (24 to 27) | 42 | 52.50 | |
| 3. | High (27 and above) | 16 | 20.00 | |

From table 1 it can be revealed that majority of the farmers i.e., 52.50 per cent belong to medium age (26 to 45 years), followed by old age (above 45) 30.00 per cent, whereas young age (up to 25) respondents were least i.e., 17.50 per cent. It can be concluded from above table that half of the respondents 50.00per cent college level education, followed by 42.50per cent respondents have high school level education, followed by 05.00% respondents have primary school level education and only 02.50 per cent of the respondents were illiterate. Near to half (47.50%) of farmers have medium (8 to 27year) farming experience, followed by 27.50 per cent farmers having high (28 and above years) of farming experience and only 25.00 per cent of farmers have low (up to 7 years) farming experience. Less than half (45.00%) of the farmers have farming + service as occupation while, 30.00 per cent were doing only farming and 25.00 per cent were farmer + labour.

Above table revealed that more than half (52.50%) of farmers were having small land holding (0.01 to 2.00 ha.), followed by 22.50 per cent were having semi medium (4.01 to 10.00 ha), 12.50 per cent of respondents were having medium (2.01 to 4.00 ha.), 10.00 per cent of farmers were having marginal land holding (up to 1 ha.) and only 02.50 per cent of the farmers were having big land holding (10.00 ha. and above). From table 1, it can be concluded that half of the respondents (50.00%) have medium cropping pattern i.e. they grow 4 to 5 crops, followed by 40.00 per cent of the respondents have low cropping pattern i.e. they grow only up to 3 crops and only 10.00 per cent of the respondents have high cropping pattern i.e. they grow 6 and above crops.

Table 1 indicated that half of the respondents (50.00%) have bore well as the major source of irrigation facility, followed by 27.50 per cent of the respondents have bore as well as well as irrigation facility, 12.50 per cent of the respondents have well as irrigation facility and 10.00 per cent of the respondents were having no irrigation facility.

Also Table 1 showed that majority 57.50 per cent of the respondents have medium (Rs. 45,001 to 1,00,000) annual income, followed by high (Rs. 1,00,001 and above) 27.50 per cent annual income and only 15.00 per cent have low (up to Rs. 45,000) annual income. The above Table revealed 55.00 per cent were having knowledge about various crop insurance schemes followed by low (25.00%) and high (20.00%) knowledge of crop insurance.

Table 1 indicated that majority (55.00%) of the respondents were having medium level of extension contact, followed by low (22.50%) and high (22.50%) extension contact respectively. From table 1 it can be concluded that majority (52.50%) of the respondents were having medium level of risk orientation, whereas, 27.50 per cent and 20.00 per cent belong to low and high level categories respectively.



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2. Awareness of farmers regarding climate change

Table 2: Awareness of farmers regarding climate change

| SI. No. | Categories | Frequency | Percentage (%) |
|---------|---------------------|-----------|----------------|
| 1. | Low (up to 25) | 14 | 17.50 |
| 2. | Medium (26 to 32) | 40 | 50.00 |
| 3. | High (33 and above) | 26 | 32.50 |

It was observed that half (50.00%) of the farmers were in medium category of awareness about climate change whereas 32.50 per cent of the farmers were having high awareness of climate change. 17.50 per cent of respondents were having low awareness regarding climate change.

3. Relationship between profile and awareness of farmers regarding climate change:

 Table 3. : Relationship between profile and awareness of farmers regarding climate change:

| SI. No. | Independent Variables | Correlation coefficient (r) |
|---------|-----------------------------|-----------------------------|
| 1 | Age | 0.493** |
| 2 | Education | 0.681** |
| 3 | Farming experience | 0.556** |
| 4 | Occupation | 0.563** |
| 5 | Land holding | 0.064 ^{NS} |
| 6 | Cropping pattern | 0.250* |
| 7 | Irrigation facilities | 0.292* |
| 8 | Annual income | 0.061 ^{NS} |
| 9 | Knowledge of crop insurance | 0.765** |
| 10 | Extension contact | 0.665** |
| 11 | Risk orientation | 0.685** |

From the table it is observed that age, education, farming experience, occupation, knowledge of crop insurance, extension contact and risk orientation are positive and highly significant with awareness of farmers regarding climate change. Cropping pattern and irrigation facilities were positive and significant with awareness of climate change.

Land holding and annual income were non significant with awareness of farmer regarding climate change. It may be due to these two factors was not related awareness of famers regarding climate change.

CONCLUSIONS

- The study indicated that the majority of farmers were from middle age group educated with college level education and medium farming experience and farming +service as major occupation. 52.50 per cent were small land holders and cultivating 3 to 4 crops per year with the help of bore well irrigation. More than half of the respondents from medium category of annual income, knowledge of crop insurance, extension contact and risk orientation.
- Further it could be observed that majority (82.50%) of respondents belong to medium to high level of awareness of farmers regarding climate change.
- All profile characteristics were significantly related with awareness of farmer regarding climate cha-



nge except land holding and annual income.

IMPLICATIONS

- Majority (80.00%) of the farmers were having low to medium knowledge of crop insurance schemes. These finding will definitely help government to conduct campaign for awareness of schemes to compensate the losses due to climate change.
- Extension functionaries are doing well for farming community, even though some farmers remain untouched. So it is necessary to utilize mass media to communicate farmers and making aware about weather reports.
- It is necessary to supports adaptive decision making and risk management functionaries in case of inevitable uncertainty by remaining flexible and adaptive.

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