*Original Research Article*

# Analysis of Farmers' Respondents on Awareness and Knowledge of Climate Change in Agriculture in Nagaland State India.


## Abstract

The impact of climate change can be seen on several crops in various regions and gives a considerable insight into the anticipated effects on the food production in the North East. North East India particularly India is taking on a visible shift due to the impact of climate change. Seasons and rainfall patterns change, rivers running dry, springs water no longer sustain communities whose livelihood depends on the existing water system to provide livestock needs, agriculture and household activities. Unplanned urbanization and economic development, deforestation and unsustainable land use in the mountainous region leads to excess surface water runoff, depletion of top soil, poor operation and maintenance of water have all contributed to the challenge. An attempt has made to collect the data from 300 farmers respondents based on Population Proportionate to Size (PPS) technique to know awareness and knowledge level about the impact of climate change in agriculture. The results revealed that majority of the respondents were aware about climate change aspects like 'terms and meaning of climate change', 'increasing temperature year after year', 'crop damages', 'changes in season pattern' etc. Regarding the knowledge level of the respondents more than half of the respondents (58.00 per cent) had medium level of knowledge followed by low (24.67 per cent) and high (17.33 per cent) levels of knowledge about climate change and related issues.



**Keywords:** Impact, Climate change, Awareness, Knowledge




## Introduction

The effects of climate change in the agriculture and livelihood sectors due to increased frequency of extreme weather, floods, droughts and decrease of crops yield are in public discussions and a great cause of concern to the government of India. Food security of India

seems to be at risk in future due to the threat of climate change. It leads to increase in frequency and intensity of droughts and floods, thereby affecting production on small and marginal farmers. The impact on forests and biodiversity will have adverse socio-economic implications for forests dependent communities and the national economy.

A large proportion of the population of North East India is rural; hence agriculture plays an important role in determining the economy of the region. Particularly in the hilly states, jhum cultivation is a dominant cropping pattern. Jhum is a local name for slash and burn agriculture practiced by the tribal groups in the North Eastern states. Although North East is probably the country's richest in terms of natural resources, the region lags behind the rest of the country in terms of per capita income and poverty levels. North East states could be attributed to higher prevalence of natural disasters (floods, droughts, cyclones, and earthquake) and weak institutional structures to manage the natural resources.

Nagaland is a North- East hilly state with mountainous terrain and it is richly endowed with natural resources. Predominantly it is an agrarian state with 70.00 per cent of its population engaged and dependent on agriculture. Traditional Jhum (or) shifting cultivation is a common practice in the State due to topographical terrain. It is primarily a subsistence agriculture based economy where jhum is the central to not only the survival needs but to the very existence, thinking and psyche of the inhabitants of the state of Nagaland. The adverse effects of climate change will be felt most strongly by the poor farmers of Nagaland, as they have fewer resources to adapt socially, technologically and financially. Therefore, the objective of this study is to know the farmers awareness and knowledge level about climate change in agriculture in Nagaland.

**Methodology of Research**

The present investigation was carried out in Chunlikha block of Tseminyu district, Nagaland state in India. The respondents were identified and selected from six villages out of thirteen villages under Chunlikha Rural development block. Population Proportionate to Size (PPS) technique was adopted to select a sample size of 300 respondents. A list of items was prepared in objectives types and the data were collected using a well structured and pre- tested interview schedule.

The awareness of the farmer respondents about climate change is measured on a two point continuum namely 'aware' and 'not aware' and scores of 2 and 1 were given respectively. Regarding the knowledge level of the farmer respondents about climate change and related issues, the selected items were administered to the respondents. According to the scores, the farmers were categorized as low, medium and high using cumulative frequency. Percentage analysis and cumulative frequency method were applied for drawing conclusions and inferences.

## Results and Discussion

### *a) Awareness of the farmer respondents about climate change*

The extent to which a community is aware of climate change reflects its level of exposure to climate risks. This data regarding awareness of the respondents about climate change and its effects of the study area were collected, analyzed and presented in Table-1.

**Table- 1. Distribution of farmer respondents according to their awareness about climate change**

**(n= 300)**

| Sl.No. | Particulars | Aware | Percentage (%) |
|---|---|---|---|
| 1 | Terms and meaning of climate change. | 294 | 98.00 |
| 2 | Increasing temperature year after year because of climate change. | 284 | 95.00 |
| 3 | Global warming due to climate change. | 276 | 92.00 |
| 4 | Variation in temperature due to climate change. | 265 | 88.32 |
| 5 | Crop damages due to weather extremities of climate change. | 260 | 86.67 |
| 6 | Floods and high intensity of rainfall is due to change in climate. | 255 | 85.00 |
| 7 | Changes in season pattern because of climate change. | 242 | 78.33 |
| 8 | Reduction in number of rainy days due to climate change. | 230 | 76.67 |
| 9 | Intense wind velocity and storms due to climate change. | 215 | 71.67 |

| | | | |
|---|---|---|---|
| 10 | Frequent cyclones are because of climate change. | 180 | 60.00 |
| 11 | Flash floods in the river banks are because of climate change. | 175 | 58.32 |
| 12 | Uneven distribution of rainfall is due to climate change. | 159 | 53.00 |
| 13 | Decreasing productivity due to climate change. | 150 | 50.00 |
| 14 | Increasing heat and cold waves is due to change in climate. | 132 | 44.00 |
| 15 | Industrialization is one of the main causes of climate change. | 108 | 36.00 |
| 16 | Ozone layer depletion is because of climate change. | 96 | 32.00 |
| 17 | Melting of glaciers and sea level rising is all because of climate change. | 90 | 30.00 |
| 18 | Acid rain is mainly caused by climate change. | 67 | 22.32 |

It could be observed from Table- 1 that majority of the respondents were aware about the climate change viz., 'terms and meaning of climate change' (98.00 per cent), 'increasing temperature year after year because of climate change' (95.00 per cent), 'global warming due to climate change' (92.00 per cent), 'variation in temperature due to climate change' (88.32 per cent), 'crop damages due to weather extremities of climate change' (86.67 per cent), 'floods and high intensity of rainfall is due to change in climate' (85.00 per cent). Similar findings were also reported by Aarthi et al. (2020).

The awareness level of respondents on some of the consequences of climate change are 'changes in season pattern because of climate change' (78.33 per cent), 'reduction in number of rainy days due to climate change' (76.67 per cent), 'intense wind velocity and storms is due to climate change' (71.67 per cent), 'frequent cyclones are because of climate change' (60.00 per cent), 'flash floods in the river bank are because of climate change' (58.32 per cent), 'uneven distribution of rainfall is due to climate change' (53.00 per cent), and 'decreasing productivity

due to climate change' (50.00 per cent). Similar findings were also reported by Nwagbara et al. (2017).

The awareness levels of the respondents was found to be minimum in the aspects like 'increasing heat and cold waves is due to change in climate' (44.00 per cent), 'industrialization is one of the main causes of climate change' (36.00 per cent), 'ozone layer depletion is because of climate change' (32.00 per cent), 'melting of glaciers and sea level rising is all because of climate change' (30.00 per cent), 'acid rain is mainly caused by climate change' (22.32 per cent).

It could be concluded that majority of the farmers were aware about climate change and its adverse effects. This may be due to the fact that majority of the respondents had fairly better level of social participation, mass media exposure and scientific orientation. This finding is in line with the findings of Onyegbula (2017) and Ado et al. (2018).

***b) Knowledge of the farmer respondents about climate change***

Knowledge of the farmers about climate change is studied with respect to different variables like rainfall pattern, temperature aspects, relative humidity aspects, heat and cold waves, environmental pollution, adverse effects of climate change in agriculture and other aspects.

The findings on overall knowledge level of respondents on climate change are presented in Table-2

**Table- 2. Distribution of farmer respondents according to their overall knowledge level about climate change**

**(n= 300)**

| Sl.No. | Category | Number | Percentage (%) |
|---|---|---|---|
| 1 | Low | 74 | 24.67 |
| 2 | Medium | 174 | 58.00 |
| 3 | High | 52 | 17.33 |
| **Total** | | **300** | **100.00** |

It is observed from the data on Table- 2 that more than half of the respondents (58.00 per cent) had medium level of knowledge followed by low (24.67 per cent) and high (17.33 per cent) levels of knowledge about climate change.

It could be concluded that the reason for medium level of knowledge about climate change might be due to the fact that majority of the farmers had education from primary up to middle school level with medium levels of mass media exposure and social participation.

Majority of the farmers had possessed medium knowledge level which is passed on them from their ancestors. In contrast, science and technology are making a vast contribution for improving the farming system, the real problem is the lack of application of existing knowledge. This is due to poor distribution of knowledge or when it is available the information is not in a form that is usable.

The failure to apply knowledge that conflicts with traditional practices, social and legal conventions and the existing power structures within communities and nations. Similar findings were also identified by Kanagasabapathi and Sakthivel (2020) and Burton et al. (2002).

**Conclusion**

It is imperative that farmers possess the necessary skills and knowledge to implement alternative production techniques. A clear and distinct role for strengthening research particularly on climate change and extension services in vulnerable regions is the need of the hour. Consequently new policies should focus on awareness and knowledge creation on climate change related to agriculture through different sources such as mass media, newsletter, article and extension services to the rural populace particularly to the developing and underdeveloped region and countries.



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