

Farmers Perspectives on Climate Change in Northern Region of Nigeria

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Abstract: Climate distribution of Nigeria comprehend several vegetation belt as you move northward from the coast, northern region of Nigeria were predominantly agrarian by occupation due to their geographical location having two distinct seasons of wet and dry season. Recently there has been a global debate on climate change and its possible consequences around the world, the effects may varied based on the adaptive capacity of every region on earth, but most studies indicate the possible consequences effect on crop production particularly in sub-Saharan Africa which Nigeria is included. This study was conducted to understand the level of farmers' awareness towards climate change in the region of northern Nigeria and how they perceived climate change would affect their occupation.

Keywords: Climate change, northern region, occupation, season, farmers', northern Nigeria.

I. Introduction

In Nigeria, all the regions have different climate and environmental extremes with elevations changing from sea level to over 2500m in the uplands. The annual rainfall received in the region ranges from less than 300mm (11.8in) in Sahel region and to between 2000mm (78.8in) in high prospective areas to 1100mm (43.3in) in savannah regions, although definite zones of Nigeria were found in the northern region, due to climate regime changes of the Earth, the ecosystems resilience is facing with high risk [1]. As in most of West Africa region has a peculiar climate characteristic, the strong latitudinal zone has characterized Nigeria's climate, moving within the country from coast towards northward is becoming increasingly drier. Precipitation is the key climatic mutable and there is a marked change of dry and wet periods in most areas. Rainfall is controlled by air masses from the Atlantic Ocean (tropical maritime) which is a moist laden air moving northward of the country and the hot desert air (tropical continental) which carries warm dry air moving southward that prevail over the country. As in other parts of the world areas with highland contribute an important role in northern region of Nigeria local climate, particularly in places with highland around Jos Plateau and along the eastern border of Adamawa Bamendahighlands, consequently the environments systems are continuously in changing and the human safety in term of habitat and real conditions of life depend by both the daily activities and the natural global changes implications [2] while the water resources and agricultural areas are negatively affected [3; 4].

In recent time, empirical studies indicated that global temperature increase is real fact, that is distinct from the natural climate unpredictability, though the human forces have contribute to this change [5]. Notwithstanding this rising empirical technical confirmation, investigation indicates that, the overall population could not be able to differentiate modifications in recurrent climate patterns from weather [6; 7]. In compare to other studies that were established predominantly on descriptive investigation, indicated that agriculturalists' from different parts of the world do observe their local weather as fluctuating [8; 9; 10; 11; 12; 13]. Additionally, agriculturalists' insights have a tendency to be pretentious by accessibility to climate statistics [14; 15; 16]. Hence, this work seeks to investigate farmers' in deep knowledge concerning weather information and how they perceived the climatic change regarding their productivity in the region of northern Nigeria.

Considerable studies on perception were conducted as qualitative in nature, though they focused on numerous aspects associated with farmers' perceptions. But quantitative research on perception were uncommon in most literature, therefore it's needed towards improving our understanding on the comparative significance of these factors for increasing farmers' understanding of changing climate [17]. Most cropping systems in northern Nigeria were dominantly on rainfall with limited irrigation activities. In the last decade, Nigeria were encountered with a records of drought and flood incidences, which have affected a number of several sectors, such as agriculture, livestock production, energy, roads, education and health [18].

II. Material and methods

Survey was conducted using structure questionnaire, the essence was to understand the respondents perception on climate change and maize production in the study region, other environmental questions were incorporated to guide the respondents understand what a climate change means. The household survey of the farmers provides first-hand information on respondents' performance. Some of the questions administered include the respondent ability to adjust with climate change, what are the major inputs used, how are they applying the inputs and what are the challenges facing their production at hand and quantity of crop harvested for the last year farming. To understand how climate change impacts on maize crop production, survey method is an appropriate means since you have to be in touch with the respondents at grassroots producers in the study area also given the circumstance of the studies by [19; 20; 21; 22; 23]. The data for this study were collected using [24] survey method of cluster sampling. The data were collected from seven states of northern Nigeria. The total questionnaire administered to respondents were four hundred (400) in all, but only four hundred were considered for this study. The region had a map; the map was used to label the study state to be surveyed. The entire study region had 7-selected states that produce mostly maize, in each state the local government is considered as cluster household, and every household is associated with a particular district within it. The sample of household at districts of local government can be taken by first taking a sample of district and then, within each of the districts selected in the sample, listing villages, neighbourhoods and each household's farmer. From this resulting list of the households the final sample of farmers is drawn using simple cluster sampling that starts from simple multistage cluster sampling [25].

III. Results

A summary of socio-economic characteristics of the respondents were extracted using a total of four hundred (400) respondents. The respondents' ages were between 20 to 75 years old, with the mean of 34 years old. From the respondents 98% were males' head of household, family size numbers were bounded between 2 to 33 members in household, with the average of 9 for overall sample. Classification of respondents on basis of their education level showed that 6% of them had university degree, 23% graduated from college and polytechnic, 31% had secondary school certificate, 37% had primary school certificate and 3% were illiterate. From farming status point of view in this survey 92.7% were full-time farmers including 7.3% were part-time farmers that are either civil servants, drivers or engaged in some other petty trading. The farming practice engaged by the respondents were also tested to see if they completely rely on rainfall, the result indicated that majority of them 62.75% rely on rainfall only, while 1% rely on irrigation only and 36.25% rely on both rainfall and irrigation for crop and vegetable production.

1.1. Respondents' perception on climate change and variability

All the respondents believed that there is a noticeable change compared to the recent past, the results showed that 100% of those entire interview believe there is change in the atmospheric condition when compared to the recent past time. The result is presented in TABLE 1.0

Table 1. Perception on the noticeable change in climate

Survey question	Response	Frequency	Percent
Did you notice change in weather pattern recently	Yes	400	100
	No	0	0
Total		400	100.0

When respondents were asked about the noticeable changes they admit earlier, they choose amongst the list of possible effects from the closed ended question, they were asked to select multiple choice if needs be on noticeable signs, the result showed in TABLE 2.0, indicate that majority of them include 32.5% of the respondent were familiar with temperature change issue, 28.25% were very familiar with change in rainfall pattern, while 20% have experience on uncertainty of the planting dates, 9% of the respondents believed that the sudden change has introduced new pest and diseases in recent time, also 6.75% respondent indicates that flood has taken over some of their lands and 4% believed that there is incidence of increasing dusty wind over their land, 2.5% of the respondents made a multiple choice of their responses on noticeable signs of climate change changes.

Table 2. Respondents' perception towards noticeable sign of climate change

Response	Frequency	Percent
Change in temperature	130	32.5
Change in rainfall pattern	113	28.25
Flood	27	6.75
Uncertainty on planting date	80	20
Incidence of pest and diseases	36	9

Dusty wind	4	1
Multiple choice	10	2.5
Total	400	100.0

1.2. Perceptions towards knowledge about observing climate change over years

In response to the question “when did you start observing the problem?” 52.5% respondents reply less than 5 years ago, 23.3% respondent replied between last year to this year and 18.8% replied between 5 – 10 years of observation. While minimal number of the respondents replied 4.5% for over 10 years and 1.0% for over 20 years TABLE 3.

Table 3. Respondents’ perception on when they start observing the issue

Response	Frequency	Percent
For over 20 years	4	1.0
For over 10 years	18	4.5
Between 5 – 10 years	75	18.8
Less than 5 years	210	52.5
Between last year to this year	93	23.3
Total	400	100.0

Respondents familiarity on environmental problems, their perception on how the weather impact on their immediate environment, in response to the question, they indicate that 75.3% respondents said crop failure compare to previous years, 16.3% indicate issue of flooding, 5.5% showed that livestock diseases has manifested and 3.0% respond on human disease outbreak in recent time. Out of the 400 respondents none indicate any climate issue related to neither famine or migrating to other place due to change in weather condition, the information is presented in TABLE 4.

Table 4. Perceptions’ of climate impact on local community

Response	Frequency	Percent
Crop failure	301	75.3
Flooding	65	16.3
Human diseases	12	3.0
Livestock disease	22	5.5
Famine	0	0
Migration to other place	0	0
Total	400	100.0

Table 5. presented alikert scale of the negative impact of climate changes on maize production in the study region, 28.5% responded as moderate, 23.3% response as highly impacted, 19.0% responds as low impact, 14.5% responded as very low impacted, 9.0% indicate extremely low impact and 2.3% revealed that there is extremely high impact of the changes on maize crop production in the region.

Table 5. Perceptions’ on negative impact of change on maize production

Survey question	Extremely high	Very high	High	Moderate	Low	Very low	Extremely low
The negative impact of climate change on maize production	10 (2.5%)	13 (3.3%)	93 (23.3%)	114 (28.5%)	76 (19.0%)	58 (14.5%)	36 (9.0%)

IV. Conclusion

Farmers’ response on perception to climate change specified their level of understanding weather changes in relation to their crop production, though their understanding rallied towards their occupation of crop production which served as indicator for their measured. Crop production is the only amongst the major evidence for a farmer to give reference with, with specific reference in understanding the impact from crop production in their seasonal harvest and noticeable changes in planting date. Although farmers’ lack the scientific in-depth knowledge on the implication of climate change to their environment at present and future wellbeing of their environment to continue their crop production is the big issue. The need to educate farmers’ to understand the scientific effect of climate change is of paramount important and the need for policy implication at all level of governance to address the problems would be a goal for everyone. Keeping farmers’ wellbeing is safeguarding the future population and feeding the current population, therefore a good planned policy for better crop production and proper policy to education our farmers’ is important for all sectors to partake.

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