Farmers Perception of Climate Change on Maize Production in Khana Local Government Area of Rivers State Nigeria.

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Abstract

The study examined perception of climate change on maize farmers in Khana Local Government Area of Rivers State, Nigeria multistage sample procedure was used in selecting 110 maize farmers. Data were collected from the respondents using, structure interview schedule. Data were presented and analyses using, frequenting counts, percentage, mean statistic. Results revealed that (39.8%) of the farmers were between 41-50 years, those were married (67.5%) had formal education 75.9% were full time farmers (69.9) were Christians (97.6%), were subsistence farmers (98.8%) acquired land by inheritances (54.2%). Perception of causes of climate change were deforestation ($\bar{x}$=3.10), bush burning ($\bar{x}$=3.34), burning of fossil fuel ($\bar{x}$=3.45), methane ($\bar{x}$=3.25) and natural disaster ($\bar{x}$=3.24). The result also revealed consequences of climate change were poor crop growth ($\bar{x}$=3.53), poor crop yield ($\bar{x}$=3.65), it increased cost of production ($\bar{x}$=3.06) shortened life span of crops ($\bar{x}$=3.24) and lowered farm income ($\bar{x}$=3.37). Adaptation strategies to climate change were: change in farming season ($\bar{x}$=3.37), planting of trees ($\bar{x}$=3.46), early harvesting of crops ($\bar{x}$=3.23), prompt weeding ($\bar{x}$=3.30), mixed cropping ($\bar{x}$=3.73), and mulching ($\bar{x}$=3.92). T ($\bar{x}$=3.92). The study recommends that proper education and awareness on correct adaptation strategies as well as state support for proper adaptation on such techniques so that food supply will not be jeopardized in the long run

Introduction

Climate change is one of the most important environmental challenges facing the world today. According to Olajide, 2014), climate change is possibly the greatest environmental challenge facing the world this century. Climate change is a change in the statistical distribution of weather patterns when that change last for an extended period of time, presently these is widespread consensus in the scientific community and even among farmers that climate change is a reality and that we are already experiencing it impact. The impact of climate change awareness varies globally. The concept climate change" as the natural cycles of weather patterns on earth resulting from changes in the amount of heat received by the sun. Climate goes through warm and cold periods, taking hundreds of years to complete one cycle. According to the IPCC (2001). "These changes affect the temperature which also influences rainfall. Plants and animals are able to adopt to changing climate provided that these changes take place over hundred of years. Unfortunately, human activities are currently causing the climate to change very fast. Climate change models predict that the average air temperature over South Africa will rise by an estimated 2^0C over the next 100 years Madeleine, (2007).

The United Nations framework convention on climate change (UNFCCC, 2007) explain climate change as a change which is attributed directly or indirectly to human activity that alter the compositions of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. Climate change posses a drastic threat on maize (Zea Mays) Farmers in Khana Local Government Area of Rivers State, Nigeria. The Khana LGA which is in Ogoni are one of the many indigenous people in the South South part

of Nigeria (http://wikipedia/ogoniland) Ogoni people number approximately 500,000 and are believe to be settled in the region well before the 15th century because of their dependence on agriculture and fishing (Kpone Tanwe, Sponps, 2007). There is urgent need for a better understanding of the changing climate pattern and how they affect extreme weather events. Tompkins, 2003 cited in Mba, 2009). Adequate knowledge and awareness of the effects of climate change will help make the people of Ogoni to join forces in reducing the vulnerability of the people to climate-related risks now and I the future. The problem of climate change is becoming more threatening to sustainable economic development and the totality of human existence (Adejuwon, 2004). The developing world faces greater challenges than the developed world, both in terms of the impact of climate change and the capacity to respond to it. In addition small scale farmer (ie. Maize farmers) still suffer the most because of their dependence on rain- fed agriculture, rising temperatures, low adaptive capacity, high dependence on natural resources, inability to deflect the occurrence of extreme hydrological and methodological events due to low technological adoption, limited infrastructure, illiteracy, lack of skills level of awareness and lack of capacity to diversity (Kurukulasuviya and Mendelsohn, 2006). In Nigeria, Maize constitutes greater percentage of grain production. Maize is a summer crop and is highly susceptible to changes in precipitation and temperature (Durand, 2006, Benlin 2006). Over the years, there have been incidences of climate change in Khana LGA such as fire outbreak, foods, excessive temperature and rainfall. This has a negative impact on farm production and thus, reduces the level of farmer's living, the farmers need to be made aware about climate change in order to enable them understand and come up with better management skills as regards climate change.

Purpose of the study
The purpose of the study include to:
- Determine socio-economic characteristics of maize farmers in the study area.
- Ascertain maize farmers perception on the cause of climate change
- Identify the consequences of climate change to the maize farmers and
- Ascertain maize farmer's adaptation strategies to climate change.

Methodology
The study was carried out in Khana, one of the Local Government area that made up the 23 local Government Area (LGA) in Rivers State. Bori, the headquarter of Khana LGA, comprises of 28 communities and it has an area of 560km^2 with the density of 1734.8km^2. The area were agricultural and fishing society. The population for the study comprises of all maize farmers in Khana LGA. A multistage sampling technique was used to sample first, from the 28 communities that make up Khana LGA, 10 communities were purposefully selected. Proportionate sample of 60% were used to select respondents using random sampling technique.-point rating scale of agreement was the instrument used for data collection. A structured questionnaire designed in the pattern of Likert 5-point rating scale of agreement was the instrument used for data collection.
Ten respondent/farming were selected from the ten communities (10) supplied the primary data. Data were analysed using mean statistics.

Results and Discussion
Socio-economic characteristics of the Respondents
The result in Table 1 shows that 39.8% of the respondents were within the ages of 41-50years, with a mean age of 40.5 years which implies that the farmers involved in maize production are active, young, vibrant farmers who are in there productive stage. This

disagrees with Olajide (2014) who observed that majority of crop farmers in Oyo state were between 50-59 years. Also, on the issue of gender majority (50.6%) of the respondents were females, while 49.4% were male. The implication is that female dominated maize production in the study area. However, the marital status of the respondent showed that majority 67.5% of the maize farmers were married while 19.3% were single. The implication is that maize farming is the business of married women who have family to care of. In terms of educational level, majority (42.2%) of the respondents were secondary school holders while 24.1% were University graduate, 15.7 primary school holders. This implies that maize farmers are literate, this will increase their awareness of climate change and motivate their strategies to climate change that will help to improve yields and increase output. Thus disagrees with Olayinka *et al*, (2013) who observed that awareness of the various causes of climate change is generally below average and less than 50 percent however sees it in terms of reduced agricultural productivity of ozone layer depletion. The farming system shows a greater percentage (69.9%) of respondents were full time farmers while 30.1% were part time. The implication is that maize faming is a major occupation of the study area and their source of income, and therefore they most have enough knowledge on climate change strategies practices used in maize crop production. Majority of the maize farmers in the study area were Christians (97.6%) while 2.4% were Muslims. The implication is that South-South region were dominated by Christians Religion. The farming system experience revealed that majority (98.8%) of the respondents were subsistence farming, while 1.2% were commercial farming. Finally the method of land acquisition for maize production revealed that through inheritance (54.2%) while purchase of land of 22.9%, pledge 19.3% and communally land 3.6% respectively

Table 1: Showing Socio-economic Characteristics of Maize Farmers

Variables	Frequency (n=120)	Percentage	Mean
Age (years)			
<21 yrs	2	2.4	
21-30	13	15.7	
31-40	18	21.7	
41-50	33	39.8	40.5 years
51-60	15	18.1	
>61 years	2	2.3	
Total	83	100.0	
Sex			
Male	41	49.4	
Female	42	50.6	
Total	83	100.0	
Marital status			
Married	56	67.5	
Single	16	19.3	
Divorced/Separated	2	2.4	
Widow/Widower	9	10.9	
Total	83	100.0	
Educational Level			
No formal education	7	8.4	
Primary school	13	15.7	
Secondary School	35	42.2	
Diploma	8	9.6	
University Graduate	20	24.1	
Total	83	100.0	
Type of Farming			
Full time farmer	58	69.9	
Part time farmer	25	30.1	
Total	83	100.0	
Religion			
Christian	81	97.6	
Muslim	2	2.4	
Total	83	100.0	
Farming System			
Subsistence	82	98.8	
Commercial	1	1.2	
Total	83	100.0	
Method of land Acquisition			
Communally	3	3.6	
Inheritance	45	54.2	
Purchase	19	22.9	
Pledge	16	19.3	
Total	83	100.0	

Source: Field survey, 2018

Perception of Causes of Climate Change

Table 2 indicated the perception of causes of climate change on maize production, using a mean score of 3.0 as the decision rule. The result shows that also most all the perceptions of climate change in the study area were agreed by the respondents except for use of agro chemical and desertification that scored mean of 2.61 and 2.86 respectively that were disagreed by the respondents. This implies that deforestation ($\bar{x}$=3.10), bush burning ($\bar{x}$=3.34), burning of fossil fuel ($\bar{x}$=3.45), Methane ($\bar{x}$=3.25) and natural disaster ($\bar{x}$=3.24) were agreed as perception of causes of climate change on maize production in the study area.

Table 2: Mean Scores in Perception of Causes of Climate Change

S/N	Perception	N	Sum	Mean Score	Remark
1	Deforestation	83	257	3.10	Agree
2	Bush burning	83	277	3.34	Agree
3	Burning of fossil fuel	83	286	3.45	Agree
4	Use of Agro Chemical	83	217	2.61	Agree
5	Methane	83	270	3.25	Agree
6	Natural disaster	83	269	3.24	Agree
7	Desertification	83	237	2.86	Agree

Source: Field survey, 2018   ≥ 3.00 = Agree, ≤ 3.00, Disagree

Consequences of Climate Change on Maize Production

Table 3 revealed that all the consequences that of climate change on maize production in the study area were agreed by the respondents. This implies that poor crop growth (x=3.53), poor crop yield (x=3.65), increases cost of production (x=3.06), shorter live span of crop (x=3.24) and lowered farm income (x=3.37) were agreed as consequences of climate change in the study area.

Table 3 Mean Score on Consequences of Climate Change on Maize Production

S/N	Perception	N	Sum	Mean Score	Remark
1	Deforestation	83	293	3.53	Agree
2	Bush burning	83	303	3.65	Agree
3	Burning of fossil fuel	83	254	3.06	Agree
4	Use of Agro Chemical	83	269	3.24	Agree
5	Methane	83	280	3.37	Agree

Source: Field survey, 2018   ≥ 3.00 = Agree, ≤ 3.00= Disagree

Adaptation Strategies to Climate Change

Table 4 revealed that almost all the Adaptation strategies to climate change in the study area were agree by the respondents except for farm irrigation (in case of drought), increase in size of ridges and zero tillage that scored a mean of 2.84, 2.71 and 2.70 respectively that were disagreed by the respondents. This implies that change in farming season (x=3.37), planting of trees (x=3.46), early harvesting of crops (x=3.28) prompt weeding (x=3.30), mixed cropping (x=3.73) and mulching (x=3.92) were agreed as adaptation strategies to climate change on maize production in the study area.

Table 4: Mean scores on adaptation strategies to climate change

S/N	Adaptation strategies	N	Sum	Mean Score	Remark
1	Farm irrigation (in case of drought	83	236	2.84	disagree
2	Change in farming season	83	280	3.37	Agree
3	Planting of trees	83	287	3.46	Agree
4	Early harvesting of crops	83	258	3.23	Agree
5	Prompt weeding	83	274	3.30	Agree
6	Increase in size of ridges	83	225	2.71	Disagree
7	Mixed cropping	83	310	3.73	Agree
8	Zero tillage	83	116	2.70	Disagree
9	Mulching	83	325	3.92	Agree

Source: Field survey, 2018 ≥ 3.00 = Agree, ≤ 3.00 = Disagree

Conclusion and Recommendations

Due to prevailing problems associated with changes in weather patterns such as high temperatures, changes in rainfall patterns and effect on Green House Gases (GHGs), which has resulted in low crop production, food in security, and low income for farmers, there is a need to investigate Farmers perception of climate change on maize production. It therefore recommends proper education and awareness on correct adoption strategies, well as state support for proper adaptation of such techniques so that food supply will not be jeopardized in the long run. Furthermore provision of required infrastructural facilities of the farmers through extension services should be made a priority by Government for sustained maize crop production.

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