

# Exploring the Impact of Climate Change on Food Production in Oyo Township, Oyo State

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## **Abstract**

*The study examined the impact of climate change on food production in Oyo township, Oyo State. The study assessed the viewpoints of respondents across age group and educational background. The sample selected for the study was 150 respondents drawn from Oyo West, Oyo East and Atiba Local Government Areas of Oyo State respectively. The study employed simple random sampling and purposive sampling techniques to select the sample. A 30 items questionnaire bothering on the Impact of Climate Change (ICC) was used for the study. The study stated three research questions. The data analysis tools were Descriptive and Inferential statistics, use of table and ANOVA. The validation of Impact of Climate Change Test (ICCT) was carried out to authenticate its reliability. The instrument was administered to the people in Afijio Local Government which is outside the study areas. The results of this trial study were subjected to further validation using KR-20 and Cronbach Alpha which yielded an alpha value of 0.76 and average item difficulty index of 0.4-0.6. Findings revealed that the three major food items that were very high in price are beans, tomatoes and pepper and cassava products. The least food items that were a little bit less in price are sweet potato, onion and fruits. Differences existed in the perception of different age groups on the seriousness of climate change on beans, tomatoes and pepper and cassava products. The paper recommends among others that whoever farmers that want to embark on farming activities should prepare themselves ahead to look for river basin area so that they can do a little of watering their farm products during the period of shortage of rainfall. Also government at all levels should be of help to farmers through the irrigation method.*

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### **Introduction**

The saying that man influences the environment and environment also influences man is a truism of climate change and sustainability. This is because climate change can affect in the production of food and food can be obtained in our environment. Environment is made up of climate condition, that is the atmospheric air, the sunlight, the heat, the rainfall, harrmattan, humidity and the likes: sustainability of man or human beings could be curtailed when the environment is not favourable as a result of climate change. World Book (2001) define climate as the kind of weather a place has over a period of years. It includes conditions of heat and cold moisture and dryness, clearness and cloudness, wind and calm. Encyclopedia Britannica (2001) sees climate change as a region with certain conditions of heat and cold, rainfall, wind, sun and other aspect of weather condition that work in a normal way now changing not to work the way it supposed to work. Mabogunje (2000) sees climate change as measurable increases in the average temperature of earth's atmosphere, oceans and land masses.

The earth is currently facing a period of rapid warming brought on by rising levels of heat trapping gases, known as greenhouse gases in the atmosphere (Mabogunje, 2000). The earth has warmed and cooled many times since its formation about 4.6 billion years ago. Global climate changes were due to many factors, including massive volcanic eruptions, which increased carbon dioxide in the atmosphere, changes in the intensity of energy emitted by the sun and variation in earth's position relatives to the sun.

Greenhouse gases (GHGS) are the gases in the atmosphere that raise the surface temperature of plants such as the earth. Nicholson (2001) sees climate change as occurring naturally in the environment and from human activities. The most abundant greenhouse gas is water vapour, which reaches the atmosphere through evaporation from oceans, lakes and rivers. The amount of water vapour in the atmosphere is not directly affected by human activities. Carbon dioxide, methane, nitrous oxide and ozone all

occur naturally in the environment, but they are being produced at record levels by human activities. Other greenhouse gases do not occur naturally at all and are produced only through industrial processes. Human activities called aerosols, which offset some of the warming influence of increasing greenhouse gases. The greatest challenge to human existence in this 21st century is global food crises. In the year 2007 the whole world was alerted of its serious threat to human life and its subsistence. Every person in the world is enveloped in the fear for survival. Survival on how man or human being would be able to feed himself or herself sufficiently and not only sufficiently but for how long? This is the question everyone is expected to answer because in human's life, food is number one of every needs before others. Maslow theory of hierarchy of needs occur in degree of prepotency. The United Nations (UN) (2007) opined that the present global food scarcity is destructive, devastating and catastrophic to sustainable development. The World Food Summit (1996) sees food security as existing when not all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life. The concept of food security is seen as including both physical and economic access to food that meets people's dietary needs as well as their food preferences. Food security is built on three pillars:

1. Food Availability: Sufficient quantities of food available on a consistent basis.
2. Food access: having sufficient resources to obtain appropriate food for a nutritious diet.
3. Food use: Appropriate use, based on knowledge of basic nutrition and care as well as adequate water and sanitation (USDA), 2003).

Furthermore, Food and Agricultural Organization (F.A.O) (2008) sees food security as a situation whereby all people always have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences or an active and healthy life. Also, the United States of America (2009) Department of Agriculture opined that food security is an access by all members at all time to enough food for an active and healthy life food security

includes at a minimum. (i) The availability of nutritionally adequate and safe food and (ii) on assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing or other coping strategies) (USDA which year).

Looking at the weather condition since last year, we can deduced that the climate change has been affecting food production in the land. This year 2024 when rainfall started between April and May, it was accompanied with wind which blew many houses off until normalcy rainfall in June by middle of July there was a break which supposed to come up by August which we normally refers to as August break there was a shortage of rainfall up till this month of September and it has affected many farmers, the dry season planting could not be done, those that have planted by June and up till now are seriously lamenting because of shortage of rainfall and which have affected all the crops such as maize, yam, beans, pepper and tomatoes in short every crops has been affected negatively.

### **Statement of the Problem**

The statement of the problem of this study is to investigate the impact of climate change on food production in Oyo Township, Oyo State

### **Research Questions**

1. Which of the farm products are very serious, serious and mild with the effect of climate change in Oyo Township?
2. Is there any significant difference among age groups below 24 years, 25-49 years and 50 years and above in their perception to climate change?
3. Is there any significant difference among those with no formal education, primary education, secondary education and tertiary education in their perception of effect of climate change in Oyo Township?

### **Methodology**

The study adopted descriptive survey design. The population for this study comprised all the farmers in the three local government

areas Atiba, Oyo East and Oyo West. 50 farmers were purposively sampled from each of the three (3) local governments. The rationale for choosing these groups of farmers is that they are well integrated into the farming system with the help of Agriculture Officer in each of the local government areas. As a result of that they were able to provide useful data for this study.

**Table 1: Sample Characteristics**

Parameter	Group	N	Percentage
Sex	Male	100	66.7
	Female	50	33.3
Age	Below 24	20	13.3
	25-49	93	62.0
	50 above	37	24.7
Education	Non-formal Education	22	14.7
	Primary Education	58	38.7
	Secondary Education	50	33.3
	Tertiary Education	20	13.3

From the table I under the sex, male respondents were 100 out of 150 (66.7%) while the female were 50 (33.3%) under the age groups farmers below 24 years of age were 20 (13.3%) farmers between age 25-49 were 93 (62.0%) while farmers from 50 above were 37 (24.7%). The educational background of farmers with non-formal education is 22 which is represented by 14.7% and farmers with primary educational background were 58 (38.7%) farmers with secondary education constitute 50 (33.3%) and finally farmers with tertiary education were 20 in number represented by (13.3%).

The sample employed for the study was 150 respondents drawn from Atiba, Oyo East and Oyo West Local Government Areas respectively.

### **Instrumentation**

A 30-items questionnaire was used as the instrument testing the seriousness of the climate change on food production. The validation of Climate Change Test (CCT) was carried out to authenticate its reliability. The instrument was administered to the farmers in two communities in Afijio and Iseyin Local Governments which are outside the study areas. The results of this trial study were subjected to further validation using KR-20 and Cronbach Alpha which yielded an alpha value of 0.76 and average item difficulty index of 0.4-0.6.

Findings from the study revealed that the affected foods were beans, maize, tomatoes, sweet potato, millet/guinea corn, mellon, yam, vegetables, fruits, cassava and onion. Affected maize leaves turning to sugar cane leaf as a result of non-availability of rainfall. Affected beans could not bring out its flower, affected yam remained stand still and cannot yield well. Likewise sweet potatoes, affected millet/guinea corn remained stand still as a result of non-availability of rainfall. Mellon that doesn't require much rainfall were not left out. Tomatoes and pepper almost becoming dry due to non-availability of rainfall. Affected vegetables were also not left out. Fruits were also affected and cannot bring out good and bigger fruits. Cassava were a little bit affected and onion were also affected a little bit.

The rating was as follows: Very Serious = 4, Serious = 3, Mild = 2, Not serious = 1. The content validity was ascertained by a senior colleague before it was administered.

### **Results and Discussion**

Findings of this study are reported according to the research questions.

**Research Question 1:** Which of the farm products are very serious, serious and mild with the effect of climate change in Oyo township?

**Table 2: Effects of climate change in Oyo Township**

Farm Products (Food)	N	Mean (max = 12)	Std. Deviation	Rank	Remark
Beans	150	9.41	1.507	1 <sup>st</sup>	Very serious
Maize	150	9.36	1.367	2 <sup>nd</sup>	Very serious
Tomatoes	150	9.01	1.780	3 <sup>rd</sup>	Very serious
Sweet potatoes	150	8.89	1.758	4 <sup>th</sup>	Serious
Millet/ Guinea corn	150	8.69	1.840	5 <sup>th</sup>	Serious
Mellon	150	8.39	1.889	6 <sup>th</sup>	Serious
Yam	150	8.36	1.664	7 <sup>th</sup>	Serious
Cassava	150	8.29	1.716	8 <sup>th</sup>	Serious
Fruits	150	7.71	1.884	9 <sup>th</sup>	Mild
Vegetable	150	7.64	1.720	10 <sup>th</sup>	Mild
Onion	150	7.57	1.599	11 <sup>th</sup>	Mild

From Table 2, the farm products or food items that were majorly affected by climatic change in this area of study i.e. in Oyo township are beans, maize and tomatoes and pepper. Beans is ranked 1st position with mean score of 9.41 while maize is rated 2nd position with mean score of 9.36 and tomatoes and pepper took 3rd position with mean score of 9.01. All these three food items were rated very serious sweet potatoes is rated 4th position with mean score of 8.89 millet/guinea corn took 5th position with mean score of 8.69 mellon took 6th position with mean score of 8.39. Yam is rated 7th position with mean score of 8.36 while cassava took 8th position with the mean score of 8.29. Fruits is rated 9 position with the mean score of 7.71. Vegetable is rated 10th position with the mean score of 7.64

while onion is rated 11th position which is the last position with mean score of 7.57.

This finding was in line with Adedubu (2004) when he said that the intensive heat being experienced in this current dispensation is as a result of over afforestation and in which something urgent needs to be done to avoid burning of the living things on earth.

**Research Question 2:** Is there any significant difference among age groups below 24 years, 25-49 years and 50 years and above in their perception to climate change.

Out of the eleven farm products or food items tested, there are differences in the perception of climate change based on the groups. Areas of the differences are in the food items such as tomatoes and pepper, beans and mellon. This is presented in table 3.

**Table 3: ANOVA of farm products (Tomatoes and Pepper, Beans and mellon) based on the perception of age group**

Parameter		SS	Df	MS	F	Sig.
Tomatoes and pepper	Between Groups	19.17	2	9.58	3.112	0.047
	Within Groups	452.80	147	2.99		
	Total	471.97	149			
Beans	Between Groups	14.33	2	7.164	3.25	0.042
	Within Groups	324.04	147	2.20		
	Total	338.37	149			
Mellon	Between Groups	30.005	2	15.032	4.408	
	Within Groups	501.73	147	3.41		
	Total	531.78	149			

From table 3, it is revealed that there is significant difference in the perception of the respondent in the seriousness of climatic change as it affects tomatoes and pepper farming in Oyo township where as people in age group below 24 rated it as 8.22, the third group (50 above) rated it as 9.35. Post hoc shows the difference lies between these two groups.

In the farm product of beans, where differences also exist, (F = 3.25, P = 0.042, the difference is also between groups 1 and 3. On

mellon, there is also significant difference between group 1 and 3. Therefore based on age group no differences exist in the perception of the climatic change as it affects maize, sweet potatoes, onion, vegetables, yam, cassava, millet/guinea corn, and fruits. But due to the climate change as it affect tomatoes, beans and mellon, there are sharp differences among the age groups. The oldest age group (50 and above) were negatively affected by the climatic change in relation to its seriousness than the other younger groups. The reason behind this may not have been unconnected with the fact that farmers are at the mercy of nature there is nothing anybody can do without rain there is no farm products that can do well or better even if the farm is near the river basin, the farm products can only be a little better than that of the one that is not near. This was corroborated by Ajiboye (2001) when he said no environment no man.

**Research Question 3:** Is there any significant difference among those with no formal education, primary education, secondary education and tertiary education in their perception of effect of climate change in Oyo township.

Responses of the participants based on level of education pointed out that there was no significant difference in their perception of the effect of climate change as it affects maize, sweet potato, onion, vegetables, tomatoes and pepper, beans, yam, mellon, millet and guinea corn and fruits. But there were differences among the groups as climate change affect cassava.

**Table 4: ANOVA on the effect of climate change on cassava based on the educational qualification**

Parameter	SS	Df	MS	F	Sig.
Within Group	410.302	146	2.810	3.365	0.028
Within Group	28.37	146	2.810		
<b>Total</b>	<b>438.672</b>	<b>149</b>			

From Table 4, F-ratio = 3.365 which is significant at P = 0.028. Post hoc test by homogenous subsets shows that the group falls into two subsets, groups 1, 2 and 3 (Non-formal, primary, secondary) fall into one group while primary, secondary and tertiary also

constitute another group. However, the major differences lies between groups with no formal education (means score = 7.85) and group with tertiary education mean score is = 9.18, Group with tertiary education considered the effect of climate change on cassava more serious than the group with no formal education.

### **Discussion**

The people of Oyo township practices farming to its fullness, both the younger and older ones but the problem of climatic change seriously affect the farmer in the area. As we are all aware that farmers most especially are at the mercy of nature, when it comes to practicing agriculture anywhere in the world. Without rainfall apart from the farmer, that need it mostly, environment cannot be conducive, infact there would be dryness all over and every nooks and cranny would be tense and hot.

We can see from the study that almost every farm product was affected with little differences in the degree and level of seriousness as it affect them. For instance, it is the believe that farm products like cassava, beans and all other legumes required little rainfall, but all the leguminous crops needed rainfall when they are bringing out their flowers because it is the flower that will metamorphos to seed and if the rain they are in need of is not forthcoming it will affect them. Cassava on the other hand though can withered the storm of dryness but the moment rain required is not forthcoming the tuber will remain stagnant which shows the level of low production. This was corroborated by Ogundare (2003) when he reported that no environment no man.

The Earth Institute (2020) also pointed out that the negative use of the environment has greater impact in changing the climatic condition and this could affect the living things on earth.

### **Conclusion**

This study examined exploring the impact of climate change on food production in Oyo Township, Oyo State. The study assessed the viewpoints of respondents across age group and educational background. The sample employed for the study was 150 respondents (farmers) purposively drawn from Atiba, Oyo East and Oyo West

Local Government Area of Oyo State. A 30-items questionnaire was used as instrument testing the seriousness of the climate change on food production. It was revealed from the findings of the study that nearly all the farm products i.e. food item were affected by the climate change and in which the federal and state government should as a matter of urgency come to the aid of farmer by helping them with irrigation method for farming activities so as to have food in abundance and with moderate and affordable price.

### **Recommendations**

Based on the findings from the study the following recommendations were made:

- a. `Governments at all levels, local, state and federal should endeavor to provide irrigation facilities to farmers most especially in the rural areas where farming are mostly practiced.
- b. Non-governmental agencies in the society should also endeavor to assist the farmers in the area of irrigation facilities.
- c. Well to do people , like Dangote, Micheal Otedola and the likes can also embark on Agricultural Business because they have the means to do the irrigation facilities and to import big machinery that would aid the practice of farming in a large way and which would boost food production in large quantity to the society.
- d. Various cooperative societies can also come together to practice farming since they would have money to do it in large quantity.
- e. Corporate bodies such as Agriculture development bank that gives loan to farmers can help in giving loan to serious farmer who will utilize the money very well. They can also embark in practicing farming since they are loan borrower so as to boost production of food in large quantity.

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