

## Effect of Climate Change on Arable Crop Farmers Productivity in Ibarapa Centra Local Government Area of Oyo State Nigeria

Sadiq, Musiala.M. ,<sup>2</sup>Oladoyinbo, Oluseun.B. ,Ogunsola, Tolulope. O. , Oyelere, Gbolahan.O. , Olagoke, Olusola.O. and Oluwafemi, Z.O

Department of Agricultural Technology, Oyo State College of Agriculture,PMB 10 Igboora Oyo State

\*Corresponding Email: greatpilot1@yahoo.co.uk

### Abstract

The study was an analysis of the Effect of climate change on arable crop farmers' productivity in Ibarapa central local government of Oyo state, Nigeria. Primary data were collected using structured interview guide, administered on 100 arable crop farmers using multistage sampling technique. Data collected were analyzed using descriptive statistics (frequency and percentage) and inferential (partial correlation) statistical tools. The result showed that the mean age was 47.6years while 97% were married. However 97.00% of the arable crop farmers reported to have had malaria attack occasionally within the last 10 years and 83.00% in the last five years while 64% reported malaria occurrence within the last one year. Majority (83.00%) of the respondent stated that erratic rainfall as compared to other causes had more effect on their productivity while just a few (7.00%) of the respondent claimed that low heat was the cause of their low productivity. The hypothesis tested revealed that the socioeconomic characteristics of the arable crop farmers such as age (0.7490), sex (0.3200), household size (0.4580), income (0.5500) and educational status (0.3240) had significant positive relationship with their levels of productivity. It was recommended that the arable crop farmers should form farmers association to pool resources together to acquire irrigation gadgets so as to alleviate the problem of erratic nature of rainfall in the area and Nigerian Meteorological Agency (NIMET) should be more alive to her weather forecast responsibilities in the area of using diverse languages of the people in the Nigerian agricultural zones.

**Keywords:** Climate Change, Arable crop, Farmers, Productivity

### 1.0 Introduction

Fernando, Wickremasinghe and Wickremasinghe (2010) defined climate change as a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period – typically decades or longer- that may be attributed to natural internal processes, external forcing, or persistent anthropogenic changes in the composition of the atmosphere or in land use.

According to Obiora (2011) climate change is a global natural phenomenon involving discrepancies in the occurrence and magnitude of sporadic weather events and the concomitant rise in the world mean surface temperature which poses serious environmental and health hazards. United Nations possesses serious framework convention on climate change.

(UNECC) opined further that climate change can be defined as a change of climate which is attributed directly or indirectly to human activities which alters the composition of the global atmosphere, which is in addition to the natural climate variability observed over comparable time periods. Inter governmental Panel on Climate Change (2007) also gave the definition of Climate Change as the state of climate that be identified (e.g. using statistical test) by changes in mean and/or variability of its properties, and that persist for an extended period typically decades or longer.

In view of the above assertion, the study will provide answers to the following questions.

1. What are socio-economic characteristics of the arable crop farmers.
2. Does climate change have influence on arable crop farmers' productivity?
3. What are the levels of productivity in the past five farming seasons
4. What are the causes of observed changes in productivity
5. What coping strategies have you been using to boost your productivity?

### 2. Objectives of the Study

The broad of this study is to determine the effect of climate change on selected arable crop farmers' productivity in Ibarapa Central Local Government area of Oyo State.

The specific objectives are to:

- (i) Determine the socio-economic characteristics of arable crop farmers in the study area.
- (ii) Determine the influence of climate change on arable crop farmers' productivity.
- (iii) Ascertain the levels of productivity in the past five farming seasons.
- (iv) Ascertain the causes of observed change in productivity.
- (v) Identify the coping strategies being used to boost productivity.

## HYPOTHESIS

The hypothesis is stated in null form as follows:

$H_0$ : There is no significant relationship between the Social Economic characteristics of arable farmers and the levels of productivity.

## 2.0 Methodology

### The study Area

The study was carried out in Ibarapa central local government of oyo state, and it is made up of two major towns which are Igboora and idere . There are ten political wards in the study area with igboora having 7 wards and idere with 3 wards.Igboora consist of the following towns Igbole, Pako, Iberekodo, Saganu, Idofin and Igboora while Idere consist of the following towns Koso, Molete, Okeoba and Idere villages the study area has an estimated population of 116,809 according to the 2006 population census with a land mass of 480,424sqkm it is also located along lattitude  $3^0 00$  and  $3^0 30$  and longitude  $7^0 18$  and  $7^0 40$ . The study area was created on 4<sup>th</sup> December 1996 by the then head of state General SaniAbacha, it is branded in the east by Ibarapa East local government in the west and north by Ibarapa north and in the south by OgunState. The people of the local government are predominantly Yoruba's who speak the real Yoruba dialect but other ethnic groups could be found trading in one article or the other. There are also hausa's, Fulani' ,Igbo's ,Togolese and Ghanian's. Ibarapa central has multi-religious leanings with muslims and Christians in the majority. The vegetation of the area is largely rainforest and savannah and this makes it possible to cultivate a wide array of crops ranging from tree crops to arable crops.The largest populace of the local government concentrates on agriculture due to abundant fertile farm lands. Yam tubers, cassava mangoes corn, millet tomatoes okara are some major crops available in large quantities for local consumption and even for export because Ibarapa division is given the appellation of food basket of Oyo State, which makes it unique among the local government of the federation.

### Sampling Technique

Multistage sampling procedure was employed in the study to select respondents within the study area. The study area consist of 10 political wards out of which 3 wards(i.e.30%) were randomly selected. 8 villages were randomly selected from the three 3 wards.20% of the farmers from the farmers registers obtained from the wards were randomly selected totaling 120 farmers out of which only 100 interview guide were collected and analyzed representing 83.3% response rate.

### Sampling frame

	30% of the wards ( 3wards )	Sampled villages	Ramdonly respondent	sampled
Molete and idere villages wards		Abola,	20	
		Atokun	10	
		jagun	10	
Pako and villages		Sekere	20	
		Balogun/Apata	10	
Isale oba and villages		Fedegbo	20	
		Araromi	10	
		Arigba	20	
Total			120	

Source Field Survey,2013

### 3.0 Result and Conclusion

**Table 4.0 showing the social economics characteristics of respondents**

Variable	Frequency	Percentage	mean
<b>Age (years)</b>			
<20	1	1.00	
21-30	10	10.00	
31 -40	30	30.00	
41 -50	24	24.00	47.6
51 -60	11	11.00	
Above 60	24	24.00	
<b>Sex</b>			
Male	83	83.00	
Female	17	17.00	
<b>Marital Status</b>			
Single	3	3.00	
Married	97	97.00	
<b>Religion</b>			
Christianity	55	55.00	
Islam	44	44.00	
Traditional	1	1.00	
<b>Farm size</b>			
<=5	51	51.00	
6 – 10	41	41.00	
11 -15	5	5.00	5.94
16 -20	2	2.00	
21 - 25	0	0.00	
26 - 30	1	1.00	
<b>Household size</b>			
<=5	31	31.00	
6 – 10	55	55.00	7.19
11-15	12	12.00	
16 – 20	1	1.00	
21 -25	1	1.00	
<b>Total income</b>			
<100,00	29	29.00	
100,000 – 500,000	53	53.00	
600,000 -1,000,000	8	8.00	326,600
>1,000,000,00	10	10.00	
<b>Educational level</b>			
No formal education	39	39.00	
Primary sch uncompleted	10	10.00	
Primary sch completed	25	25.00	
Secondary sch uncompleted	4	4.00	
Secondary sch completed	19	19.00	
Tertiary edu	3	3.00	
<b>Total</b>			

Source: Field Survey, 2013

Findings in Table 1. Some farmers (30.00%) are between 31-40 years while only one arable crop farmer (1.00%) falls within 20 years. The mean age (47.6) implies that arable crop farmers are in their active age which could enable them to adapt the influence of climate change as affecting their productivity. The Table further show that

majority (83.0%) of the arable crop farmers are male while 17.0% are female. This implies that arable crop farming in the study area was dominated by male farmers. Majority (97.00%) of the arable crop farmers in the study area were married while few (3.00%) were single. It indicates that the majority of the arable crop farmers are matured and responsible. Slightly above average (55.00%) of the arable crop farmers in the study area were Christians, just a little below average (44.00%) were Muslims while only one percent (1.00%) was a traditional worshipper. This indicates that the advent of missionaries has reduced the commitment of the arable crop farmers in the study area to the traditional way of worshipping. Findings show that the (51.00%) of the arable crop farmers in the study area cultivate less or equal to 5.0 hectares of land while only 1% arable crop farmer operate between 26 and 30 hectares of land. The implication of this is that arable crop farmers in the study area were small scale farmers.

From the table it was also found that above average (55%) of the respondents have between 6-10 persons in their households while only 2% has between 16-25 persons in their families. This implies that there is availability of family labour for the farming activities in the study area. Also from the table it was observed that above average (53%) of the respondents in the study area were found to be realising between 100,000 -500,000 naira annually from the sales of their crops while only 10% realises above one million naira in a year. This implies that despite the coping strategies adopted by arable crop farmers in the study area they still find it difficult to meet the experimental station yield. From the table also it can be seen that majority of the respondents in the study area have passed through formal education .with 10% of the respondent who did not complete their primary education, 25% completed their primary education and 4% did not complete their secondary education while 19% completed their secondary school education and 3% completed their tertiary education.

Table2 : Influence of climate change on crop productivity

Respondents	Yes	No
	100(100.00)	0(0.00)
TOTAL	100.00	0.00

Source : Field Survey, 2013

All the respondents in the study area attested to climate change as having influence on their productivity. This implies that no arable crop farmer in the study area is left out in the knowledge of climate change.

Table 3 Extent of influence on crop productivity

Categories	Frequency	Percentage
High	57	57.00
Medium	37	37.00
Low	6	6.00
TOTAL	100.00	100.00

Source : Field Survey, 2013

Above average (57.00%) of the arable crop farmers agreed that climate change has high effect on their productivity while just a few (6.00%) attested to have been affected by climate change at a minimal level. This implies that few of the arable crop farmers in the study area are yet to discover the impact of climate change on their production.

Table 4 Effect of elements of climate change on crop productivity

Elements of climate change	Frequency	
	Yes	No
Delayed rainfall	35(35.00)	65(65.00)
Erratic rainfall	83(83.00)	17(17.00)
Increased rainfall	19(19.00)	81(81.00)
Low rainfall	23(23.00)	77(77.00)
High rainfall	54(54.00)	46(46.00)
Excessive heat	73(73.00)	27(27.00)
Low heat	7(7.00)	93(93.00)
TOTAL	100	100

Source : Field Survey, 2013

Majority (83.00%) of the respondent stated that erratic rainfall as compared to other causes had more effect on their productivity while just a few (7.00%) of the respondent claimed that low heat was the cause of their low productivity. This shows that for optimum yield even distribution of rainfall is highly essential.

Table 5 Level of productivity in the past five farming seasons

Level of productivity(intensity)	Frequency
High	6(6.00)
Medium	16(16.00)
Low	78(78.00)
Total	100(100.00)

Source : Field Survey, 2013

Majority (78.00%) of the respondents reported low productivity in the past five farming seasons while only 6.00% of the respondent reported that their productivity in the past five farming seasons was high. This shows that arable crop farmers in the study area had been experiencing the effect of climate change and malaria attack on their productivity in the last five years.

Table 6 Coping strategies used to boost production

Coping strategies	Frequency	Total	
	Yes	No	
Irrigation	100(100.00)	0(0.00)	100.00
Cultural practices	54(54.00)	46(46.00)	100.00
Native knowledge	93(93.00)	7(7.00)	100.00

Source : Field Survey, 2013

Table 6 shows that of all the coping strategies 100.00% of the respondents embraced the artificial supply of water to their farm while majority (93.00%) claimed that they have been using native knowledge in coping with the challenges of climate change. This implies that water is highly essential in arable crop production and alternative sources should be identified to mitigate the effect of water shortage due to climate change.

Hypothesis: There is no significant relationship between personal characteristics of the arable crop farmers and their level of productivity. This was tested using partial correlation analysis and the result are presented in Table 7

Results in table 7 shows significant relationship between arable crop farmer's age ( $r = -0.0340$ ,  $p < 0.05$ ); sex ( $r = -0.1054$ ,  $p < 0.05$ ); farm size ( $r = -0.0600$ ,  $p < 0.05$ ); household size ( $r = -0.0787$ ,  $p < 0.05$ ); income ( $r = -0.0635$ ,  $p < 0.05$ ); educational status ( $r = 0.1045$ ,  $p < 0.05$ ) and their level of productivity. This implies that farmers who are high income earners, of mature age, reasonable household farm size and of good educational background have high yield.

Table 7 Test of relationship between personal characteristics and level of productivity

Variables	r	Pvalue	Decision
Age	-0.0340	0.7490	S
Sex	-0.1054	0.3200	S
Farm size	-0.0600	0.5720	S
Household size	0.0787	0.4580	S
Income	-0.0635	0.5500	S
Educational status	0.1045	0.3240	S

### 3.0 Summary

This study was conducted in Ibarapa central local government of Oyo state, Nigeria. A multistage sampling technique was used to select one hundred respondents with the use of structured interview guide to elicit information from the arable crop farmers. Data obtained were analysed using descriptive (frequency and percentage) and inferential (partial correlation) statistical tools. The result revealed that most (83%) of the arable crop farmers were males, 39% had no formal education and 55% had household size ranging from 6 – 10 persons with mean age 47.6 years while 97% were married. The hypothesis tested revealed that the socioeconomic characteristics of the arable crop farmers such as age, sex, household size, income and educational status had significant relationship with their levels of productivity.

### 4.0 Conclusion

It can be concluded from the findings that the socioeconomic characteristics of the arable crop farmers have significant relationship with their level of productivity and that climate change have influence on productivity.

### 5.0 Recommendation

Based on the result of this study it is recommended that

The arable crop farmers should form farmers association to pool resources together to acquire irrigation gadgets so as to alleviate the erratic nature of rainfall in the area.

---

Nigerian Meteorological Agency (NIMET) should be more alive to her weather forecast responsibilities in the area of using diverse languages of agricultural zones in Nigeria.

**REFERENCES**

- Obiora, S.(2011): Climate Change: Nigeria Risk Food Scarcity, Health Hazards; Nigeria Compass Newspaper, Western publishing Company Limited Isheri, Ogun State,4(1134):5.
- Wickemasinghe A.R, Wickemasingle, S.D., Fernando (2010) Climate Change and Malaria: A Complex relationship UN Chronicle,2:14-16.

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage:

<http://www.iiste.org>

## CALL FOR JOURNAL PAPERS

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. There's no deadline for submission. **Prospective authors of IISTE journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> The IISTE editorial team promises to review and publish all the qualified submissions in a **fast** manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

## MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Recent conferences: <http://www.iiste.org/conference/>

## IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

