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# Climate Change and Adaptation by Yam Farmers in Anambra West Local Government Area in Anambra State, Nigeria

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## Abstract

This paper examined climate change and adaptation by yam farmers in Anambra West Local Government Area in Anambra state, Nigeria. 12 farmers each from the communities that make up the local government were selected using random sampling techniques and this gave a total sample size of 120 farmers. Interview schedule was used for data collection and frequency, percentage, mean score and standard deviation were used in analyzing the data. The result shows that 81.7% of the respondents were male and the mean age was 40.1. About 45.8% of the respondents were married while majorities (69.2%) of the respondents were full-time farmers. Use of mounds and ridges (2.87), early planting of crops (2.80), increase in farm size (2.75), early harvesting of crops (2.70), shifting from water to dried region (2.68) and change in farming system (2.24) were used as coping strategies for climate change by the farmers. However, traditional beliefs (2.72), lack of access to information (2.71), high illiterate levels among farmers (2.57), no knowledge of weather forecast by the farmers (2.67) and lack of knowledge on climate change (2.43) were seen as constraints to climate change adaptation strategies in the study area.

**Keywords:** Climate change; Adaptations; Yam farmers

## Introduction

Agriculture is one of the most important sectors of Nigerian economy that contributes significantly to the well-being of the rural poor, sustaining 90 percent of the rural labour force, accounts for about 25 percent of Gross Domestic Product, two-third of the Nigerian workforce and about 5 percent of total exports [1].

Climate change is a change in global weather patterns which caused by more extreme weather events like storms, floods, drought, rainfall and temperature [2]. Agriculture which is the pillar for nation building is extremely vulnerable to climate change. Therefore, what affects agriculture indirectly, affect all directly. Climate change has a mixed effect on agriculture with

some areas benefitting from moderate temperature increase and others being negatively affected [3]. Anambra West Local Government Area is a riverside area which is always prone to excessive rainfall and flood. However, because of the effects of climate change on agriculture, farmers in the area have adopted different strategies for climate change. According to Albert, Harry and Ishikaku [4] an adaptive strategy to climate change is human preventive or intervention methods aimed at reducing the direct effect of increase in greenhouse gases on agriculture. In view of this, an adaptive strategy could be seen as methods used to reduce the effects of climate change to ensure sustainable livelihoods of the rural arable farmers. Irrespective of the coping strategies stated by intergovernmental panel on climate change (IPEC), there seem to be differences in farmers' traditional ways of doing things and actually understanding what climate change is and managing strategies to climate change variability. In the light of this, it behooves this study to assess the perceptions of the yam farmers with regards to climate change and adaptation in Anambra West Local Government Area. The specific objectives were to:

- Determine socioeconomic characteristics of farmers.
- Identify the adaptive strategies to climate change in the study area.
- Ascertain the constraints to the coping strategies.

## Materials and Methods

The study area for this research is Anambra West. Anambra West is a local government area in the northwestern part of Anambra state, Nigeria with her headquarters at Nzam. The local government lies on the latitude 6.33N and longitude 6.83E. ([www.digplanetet.com/wiki/AnambraWest](http://www.digplanetet.com/wiki/AnambraWest)). The estimated population of the local government in the last population census is 167,303 (NPC, 2006).

The communities that make up the local government are as follows: Mmiata Anam, Umuoba-Abegbu Anam, Umuenwelum Anam, Oroma-Etiti, Umueze Anam, Umudora Anam, Umuikwu Anam, Inoma-Akator, nzam, Igbedor and Iyiora Anam. Farming and fishery are the major occupation of the people in the area.

Anambra East is also rich in crude oil and natural gas. Types of crops grown are yam, cassava, maize, potato, okro etc.

In this study, ten communities out of the eleven communities that make up the local government were used for the research. Mmiata Anam, Umuoba-Abegbu Anam, Umuenwelum Anam, Oroma-Etiti, Umueze Anam, Umudora Anam, Inoma-Akator, Nzam, Igbedor and Umuikwu Anam were selected due to their frequent effect on climate change. 12 farmers each from a community were selected using random sampling techniques and this gave a total sample size of 120 farmers that were used for the study.

Data were collected through a structural interview schedule. Data collected for this study were analyzed using frequency, percentage, mean score and standard deviation.

## Results and Discussion

**Table 1** shows that majority (81.7%) of the respondents were male while 18.3% of the respondents were female. This implies that male dominated yam farming in the study area. The domination of male farmers in yam production could be as a result of some traditional beliefs which say that females are not allowed to grow yam in some Igbo land or as a result of rigorous activities associated with yam production. About 45.8% of the respondents were married while 16.7% of the respondents were single. The average mean age was 40.1 years. This implies that the respondents were still in their active productive years. This result is opposite to Albert, Harry and Ishikaku [4] who found farmers in Ahoada-East local government area, Rivers state to above their productive years and this could undermine the growth of agricultural system in the area, because farmers lacked the stamina to produce crops. The average mean household size of the respondents was 6 while the average farm size was 1.8 ha. Majority (69.2%) of the respondents were full-time yam farmers while 66.7% of the respondents did not have formal education. This high percentage of illiteracy among farmer could reduce the adoption of innovations in the study area. The average years of farming experience were 13 years. This shows that farmers had long farming experience and this could make them reject some suggested adaptive strategies for climate change. 63.3% of the farmers have access to credit while 65% of the farmers did not have access to extension service.

**Table 1:** Percentage distribution of farmers according to socioeconomic characteristics.

Variables	Frequency	Percentage	Mean (M)
Sex			
Male	98	81.7	
Female	22	18.3	
Marital Status			
Single	20	16.7	
Married	55	45.8	
Window	16	13.3	

Divorce	18	15	
Separated	11	9.2	
Age:			
21-30	42	35	
31-40	23	19.2	
41-50	45	37.5	40.1
51-60	10	8.3	
Household Size			
01-Feb	36	30	
03-Apr	39	32.5	
05-Jun	23	19.2	
7 and above	22	18.3	6
Farm Size			
<1 ha	25	20.8	
1-2 ha	75	62.5	
3-4 ha	20	16.7	1.8
Occupation			
Fulltime yam farming	83	69.2	
Trading	20	16.7	
Civil Servant	11	9.2	
Pensioner	6	5	
Source of farm Land			
Inherited	25	20.8	
Rented	81	67.5	
Inherited/Rented	14	11.7	
Source Of Labour			
Family	27	22.5	
Hired	93	77.5	
Source of Agro Inputs			
Input dealers	80	66.7	
Fellow farmers	25	20.8	
AADP	6	5	
Research Institute	9	7.5	
Educational Level			
Non formal education	80	66.7	
Primary school completed	30	25	
Secondary school completed	6	5	
OND/NCE	4	3.3	
Farming Experience			
1-10 years	85	70.8	
11-20 years	30	25	

21-30 years	5	4.2	13 years
Access to Credit			
Yes	76	63.3	
No	44	36.7	
Access To Extension Service			
Yes	42	35	
No	78	65	
Social Participation			
Member	23	19.2	
Non member	97	80.8	
Source: Field Survey, 2015			

**Table 2** shows the coping strategies used by the farmers in the study area. The coping strategies were grouped into always, sometimes, and not at all respectively. Use of mound and ridges with a weighted mean score 2.87, early planting of crops with a weighted mean score 2.80, increasing of farm size with a weighted mean score 2.75, early harvesting of crops with a weighted mean score 2.70, shifting from water to dried region with a weighted mean score 2.68 and change in farming system with a weighted mean score 2.24 respectively were used as the coping strategies for climate change by the farmers. These findings disagree with Ole, Cheikh, Anette and Awa [5] who recorded prompt weeding, protection of water sheds and afforestation as strategies adopted by farmers in Niger Delta to reduce the effects of climate change on their crops. However, the results also agreed with Albert, Harry and Ishikaku [4] who reported early harvesting as one of the coping strategies used by the farmers in Ahoada-East local government area, Rivers state.

**Table 2:** Shows coping strategies for climate change by the farmers.

Variables	Mean	SD
Use of mounds and ridges	2.87	0.341
Early planting of crops	2.8	0.559
Increase the farm size	2.75	0.523
Early harvesting of crops	2.7	0.616
Shifting from water to dried region	2.68	0.661
Change in Farming System	2.24	0.87
Planting of trees	1.71	0.627
Mixed farming	1.61	0.677
Use of Agro Forestry System	1.6	0.679
Crop Diversification	1.33	0.549
Farm Irrigation	1.06	0.235
Source: Field Survey, 2015. Cut-off point=2 and above		

**Table 3** shows the constraints to effective climate change adaptation strategies by yam farmers in the study area. The

finding shows that traditional beliefs with a weighted mean score 2.72, lack of access to information with a weighted mean score 2.71, high illiterate levels among farmers with a weighted mean score 2.57, no knowledge of weather forecast by the farmers with a weighted mean score 2.51, and lack of knowledge on climate change with a weighted mean score 2.43 respectively were seen as the constraints militating against climate change adaptation strategies by the yam farmers. This result is in line with Albert, Harry and Ishikaku [4] who reported that traditional beliefs, lack of access to information among farmers and no knowledge of weather forecast as constraints to climate change adaptation strategies but disagree with them on lack of credit facilities and non-availability of improved inputs/seeds.

**Table 3:** Constraints to climate change adaptation strategies.

Variables	Mean	SD
Traditional beliefs	2.72	0.582
Lack of access to information	2.71	0.614
High illiterate levels among farmers	2.57	0.695
No knowledge of weather forecast by the farmers	2.51	0.799
Lack of knowledge on climate change	2.43	0.847
Non availability of improve farm inputs/seeds	1.99	0.642
Communal way of land ownership	1.87	0.621
Lack of credit facilities	1.77	0.587
Source: Field Survey, 2015. Cut-off point=2 and above		

## Conclusion and Recommendation

As to reduce the effect of climate change on crop, yam farmers adopted some strategies such as: use of mound and ridges, early planting of crops, increase of farm size, early harvesting of crop, shifting from water to dried region and change in farming system. The implication of this is that some of them are aware of climate change in local terminology and its effects on the crops. Traditional beliefs, lack of access to information, high illiteracy among farmers, no knowledge of weather forecast and lack of knowledge on climate change were reported as the constraints to their adaptive strategies.

This research therefore, recommends that stakeholders of weather forecast in collaboration with extension agents should make it available to farmers in order to be abreast with weather condition. Some other coping strategies stated by intergovernmental panel on climate change (IPCC) should be articulated into their beliefs and norms in order to have a wider knowledge on climate change mitigation. Stakeholder and extension agents should organize workshop on climate change for farmers in the study area to enable them have a proper knowledge on climate change and mitigation.

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