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Vol. 4, 2011

CONTENTS

1. Effects of Municipal Dump sites on heavy Metals Contamination of Soil: Case Studies from Onisha, Nigeria. Atedhor, G.O. and Okoh, M.C. 1-8
2. Chemical Characteristics of Water Supply in Isin Local Government Area, Kwara State, Nigeria. Adeniyi, A 9-14
3. Access to Improved Sources of Water and Basic Sanitation in Minna Metropolis, Nigeria. Laah, J.G., Akpu, B., Abubakar, M. and Onugba, A 15-25
4. Dimensions of Urban Environmental Health Hazards in Ilorin, Nigeria. Orire, I. O. and Abdulraheem, M. O. 26-37
5. Effect of Climate on Malaria and Typhoid Fever in Ilorin, Nigeria. Adeleke, E. A. 38-46

VOL. 5, 2012

6. Coping With Environmental - Indeed Changes in Tomato Production in Rural Settlements of Zuru Local Government Area of Kebbi State. Yusuf R. O. 47-54
7. Adaptation to Climate Change-Induced Reduction in Crop Yield among Rural Women in Kwara State, Nigeria. Tunde, A. M. 55-63
8. The Neglect of Endogenous Knowledge in Land Use Planning in Africa: Implication for Food Security. Abdulrahim, M. A. 64-74
9. A Comparative Analysis of Logistics Problems Association With Port Cargo In Nigeria. Ubogu A. E., Ariyo, J. A. and Mamman, M. 75-87
10. Public-Private Partnership in Transport Infrastructure Provision in Nigeria: The Example of the Lekki-Epe Expressway Concession Project. Aderamo, A. J. 88-95
11. The Role of Microfinance Bank (MFBS) In Rural Development: example from selected Rural Communities of Kwara State. Fashagba, I. 96-102

Adaptation to Climate Change-Induced Reduction in Crop Yield among Rural Women in Kwara State, Nigeria.

By

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Abstract: *Climate change can be regarded as any alteration in the climatic parameters over a period of time. Men and women adapt to climate change in different ways. This study examines the adaptation to climate change-induced reduction in crop yield among rural women in Edu LGA, Kwara State, Nigeria. Both primary and secondary sources of data were used to elicit information in the study area. Three hundred (300) copies of questionnaire were randomly administered on the women farmers in Lafiagi and Shonga. The study employs descriptive statistical method such as means and percentages to analyze the data collected. The results reveal 65% had experienced reduction in crop yield while 35% had experienced total loss as a result of climate change over the years. Furthermore, 51.7% adapted planting different types of crops to cushion the effects of climate change. Other strategies adapted include planting of cover crops (15%), changing from planting crops to livestock keeping (4%), soil conservation (8.3%), changing the types of crops planted (12.7%), move to another site (5%), pray to God (3.3%). It concludes by emphasizing on adaptation to climate change to help people especially women secure their lives and livelihoods and develop new method of agriculture. The study however, recommends that rural women farmers' methods of adaptation to climate change can be adopted in similar communities. Rural women with local ideas should be allowed to be part of climate change negotiations processes in order to learn from their indigenous knowledge on how to adapt and mitigate the effects of climate change.*

Keywords: Women Farmers, Impacts, Vulnerability, Rural Areas and Nigeria.

Introduction

Climate change is regarded as any change in the climate as a result of natural variability or anthropogenic activity. It is any long-term alteration in the statistics of weather over periods of time that range from decades to millions of years, the change may be in the mean weather conditions, in any other part of the statistical distribution of weather or the probability of extreme condition (Public Private Alliance Foundation, 2011). Rural women and men particularly poorer and most vulnerable in developing countries are experiencing the impact of climate change, growing competition for land and price volatility for food and inputs.

Climate change may occur in a specific

area, or across the globe (Wikipedia, 2009). Yocogan-Diano (2009) opines that the unparalleled greed of imperialist government and their corporation in their desire to control and plunder the world's remaining resources and amass more wealth has resulted to climate change. The manifestations of climate change include extreme weather conditions such as inconsistent rainfall, severe cyclones, prolonged droughts, water shortages, soil erosion, hurricanes and floods. Other impacts include reduced output in ecosystems and productivity of the agriculture, forestry, fishery sectors and in turn, livelihood losses and food insecurity, diminished water supplies and heightened incidence of certain diseases.

Environmental Issues

Rural women are more vulnerable to climate change than men. Women are affected directly and severely by natural disasters because of their social, ascribed roles and the impacts of poverty. Climate change is an important issue in Africa particularly in Nigeria where the economy is agro based and has the largest group of people (women 60-80percent) in farming activities (World Bank, 2003). Climate change is therefore extremely important and requires thorough exchange of information for the understanding of women's socio-economic conditions. Generally in the rural areas, climate change is a gender issue. For instance, a study conducted in South Africa's rural KwaZulu-Natal province by the German think-tank Heinrich Boll Stiftung showed that women's workloads were increasing as a result of climate change. Hence, women worked longer hours than men and were both physically and emotionally drained from the burden of the well-being of dependent children and old members of the family.

Globally, the issue of climate change has been discussed in various forums, but research has shown that grass root communities particularly rural women have little knowledge on the subject and how it affects their day to day lives (Mbire, 2010). Based on this, it is important to determine whether or not rural women farmers are knowledgeable enough on how climate change affect their livelihood, agricultural production and how they adapt to it. In doing this, the study examines the status of the rural women farmers, perception and vulnerability to climate change. It also determines the impact of climate change on their crops. Further and more importantly, the traditional top-down approach (global study) has failed to address the regional and local impacts and the local abilities to adapt to climate change impacts as a result of little local and regional specificity (Yarnal 1998; Smit & Pilifosova (2003). This study therefore adopts a bottom-up (local knowledge) approach on adaptation by

rural women farmers. Adaptation to climate has been defined as the process through which the adverse effects of climate on people's health and well-being and agricultural production are being reduced by taking advantage of the opportunities that their climatic environment provides (Burton 1992, quoted in Smit et al.2000). It means passive, reactive or anticipatory adjustment that is proposed as a means improving the much expected negative effects that are connected with climate change (Stakhiv, 1993 cited by Smit et al. 2000).

The Study Area

Edu local government area (LGA) of Kwara State, Nigeria is the study area. This local government area is located between latitudes 4°30'N-5°30'N and longitude 8°30'E-9°30'E (see fig.1) with a total land area of about 2,236sqkm (Kwara State Statistical year book 2007). The study area shares boundaries with Patigi LGA to the East, Moro LGA to the west and Ifelodun LGA to the south and Niger state to the north. Two distinct climatic seasons prevail here and these are the wet and the dry seasons. The wet season lasts between April and October during which there is rain and dry season with no rain is between November and March. The average minimum temperature throughout the state ranges between 20°C and 25°C while average maximum temperature ranges from 30°C to 35°C (The Met. Office, 2007). Edu local government area is primarily agrarian with great expanse of arable land and rich fertile soils. Farming and fishing constitute the major occupations of the people. The typical cropping systems in the study area are rice-based system, sugar cane-based system, groundnut-based system, millet-based system and melon cultivation in areas located along river Niger. The National Population Commission (NPC, 2006) put the population of the study area at 201,624 people. The people found in this area are the Nupe - speaking people.

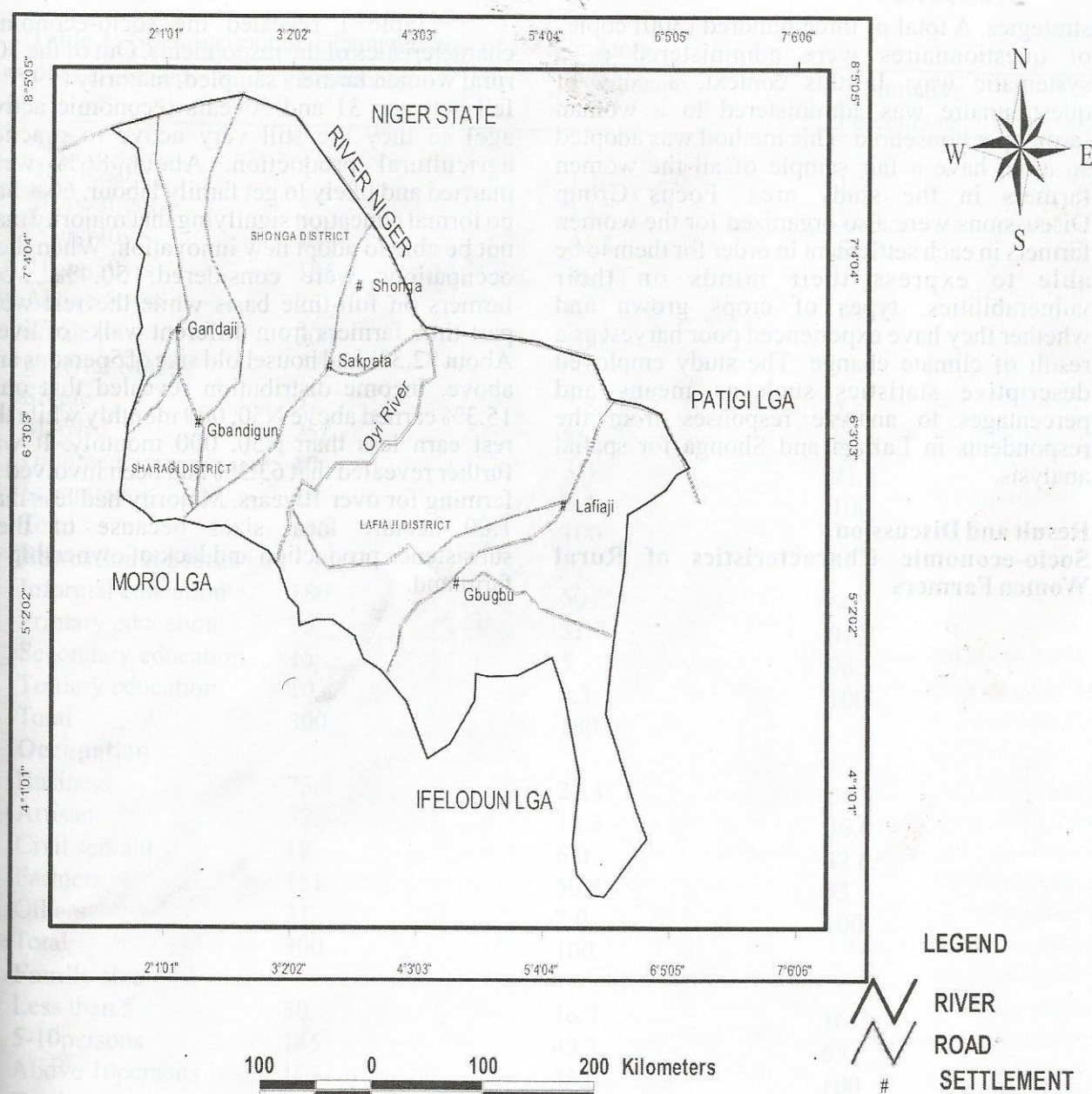


Figure 1: Map of Edu Local Government Area
Source: Kwara State Ministry of Lands and Housing, 2010

Method of Data Collection

Data for this study were obtained from both primary and secondary sources. For the household survey, two communities were chosen i.e Lafiaji and Shonga. This is based on the fact that reported cases of crop yield reduction are prevalent over the years in these settlements.

This study however examines the yield of the major crop (rice) grown in the study area. Copies of well-structured questionnaire were administered with questions capturing variables like socio-economic profile of women in the region, perceptions on climate variability and its impacts on agriculture and women coping

strategies. A total of three hundred (300) copies of questionnaires were administered in a systematic way. In this context, a copy of questionnaire was administered to a woman farmer per household. This method was adopted so as to have a fair sample of all the women farmers in the study area. Focus Group Discussions were also organized for the women farmers in each settlement in order for them to be able to express their minds on their vulnerabilities, types of crops grown and whether they have experienced poor harvest as a result of climate change. The study employed descriptive statistics such as means and percentages to analyze responses from the respondents in Lafiagi and Shonga for spatial analysis.

Result and Discussion

Socio-economic Characteristics of Rural Women Farmers

Table 1 revealed the socio-economic characteristics of the respondents. Out of the 300 rural women farmers sampled, majority (79.5%) fell between 31 and 50 years (economic active age) so they are still very active to practice agricultural production. About 86% were married and likely to get family labour, 60% had no formal education signifying that majority may not be able to adopt new innovation. When their occupations were considered, 50.4% were farmers on full-time basis while the rest were part-time farmers from different walks of lives. About 82.3% had household size of 5 persons and above. Income distribution revealed that only 15.3% earned above N50, 000 monthly while the rest earn less than N50, 000 monthly. It was further revealed that 63.3% had been involved in farming for over 10 years. Majority had less than 1.00 hectare farm sizes because of their subsistence production and lack of ownership of farmland.

Table 1: Socio-economic Characteristics of Respondents

Charac teristics	Frequency	Percentage	Cumulative Percentage
Age			
Below 20yrs	5	1.7	1.7
21yrs-30yrs	32	10.7	12.4
31yrs-40yrs	133	44.3	56.7
41yrs-50yrs	105	35	91.7
Above 50yrs	25	8.3	100
Total	300	100	
Marital Status			
Single	07	2.3	2.3
Married	258	86	88.3
Divorced	10	3.3	91.6
Separated	25	8.4	100
Total	300	100	
Educational Status			
Informal education	180	60	60
Primary education	95	31.7	91.7
Secondary education	15	5	96.7
Tertiary education	10	3.3	100
Total	300	100	
Occupation			
Business	73	24.3	24.3
Artisan	37	12.3	36.6
Civil servant	18	6.0	42.6
Farmers	151	50.4	93
Others	21	7.0	100
Total	300	100	
Family size			
Less than 5	50	16.7	16.7
5-10persons	145	48.3	65
Above 10persons	105	35.0	100
Total	300	100	
Farming Status			
Full-time	151	50.4	50.4
Part-time	149	49.6	100
Total	300	100	
Monthly Income			
Less than N10,000	35	11.7	11.7
N11,000-20,000	45	15	26.7
N21,000-30,000	53	17.7	44.4
N31,000-40,000	66	22.0	66.4
N41,000-50,000	55	18.3	84.7
Above N50,000	46	15.3	100
Total	300	100	

Source: Author's Fieldwork 2012

Changing Climate and its Impact

Opinions of the respondents on climate change were reflected in Table 2. About 80% of them indicated that rainfall amount is on the decline while only 20% perceived it as increasing. Furthermore, 93.9% were of the

opinion that the temperature is rising, 5% indicated that is reducing while 1.7% could not perceive could not perceive any change in temperature. About 56.7% opined that rainfall is highly unpredictable nowadays..

Table 2: Changing Climate and its Impact

Variables	Frequency	Percentage	Cumulative Percentage
Rainfall			
Increasing	60	20	20
Reducing	240	80	100
No Changes	-	-	-
Total	300	100	
Temperature			
Increasing	280	93.3	93.3
Reducing	15	5	98.3
No Changes	5	1.7	100
Total	300	100	
Predictability of rainfall			
Highly predictable	-	-	-
Predictable	5	1.7	1.7
Unpredictable	105	35	36.7
Highly unpredictable	170	56.7	93.4
No idea	20	6.6	100
Total	300	100	
Impacts			
Lafiagi			
Reduction in crop yield	135	45	45
Total loss	60	20	65
Shonga			
Reduction in crop yield	75	25	90
Total loss	30	10	100
Total	300	100	

Source: Author's Research 2012

All these responses revealed that respondents are aware of the alterations in the climatic parameters.

Furthermore, 45% and 20% had experienced reduction in crop yield while 25% and 10% had experienced total loss of crops (rice) in Lafiagi and Shonga respectively. Discussions were also held with women farmers at Lafiagi and Shonga on their opinion about their vulnerabilities to climate change, type of crops grown and whether they have experienced

poor harvest before. It was gathered from them that they are very vulnerable to climate change because of their ascribed roles as women. They have to cater for their families despite all odds, sometimes prioritizing provision of food for their children and husbands before catering for themselves. Crops grown include rice, groundnut, maize, guinea corn, millet, cowpea, cassava and yam just to mention a few. They further indicated that they had experienced poor harvest before as a result of climate change.

Extreme Weather Events

Table 3 revealed the responses pertaining to extreme weather event. From the table it was discovered that all the respondents had one time or the other experienced extremes in the weather events. For instance, all the respondents (100%) indicated that they had experienced drought that affected their farms either by reducing the produce realized or by destroying the whole farm.

In case of flood, 75% reported that they had experienced flood before. Also, all of them have witnessed destructive winds affecting their farm at one time or the other. All these extreme weather events reduce crop yield as excesses or

deficient of water impact plant growth negatively. Majority of them indicated that they had experienced poor harvest as a result of adverse weather in the area. Furthermore, they pointed out that they have inadequate/restricted access to production resources such as land, capital and farm input just to mention a few. Lack of access to these increases their vulnerabilities. Most of them pointed out that they are not heads of households, so decision making is done by their husbands. Even in the distribution of safety nets by government in times of extreme weather events, they are been marginalized because they are not household heads except for the few ones that are household

Table 3: Extreme Weather Events

Events	Yes	%	No	%
Drought	300	100	0	0
Flood	225	75	75	25
Destructive Winds	300	100	100	0

Source: Author's Research 2012

Crop Yield:

Respondents were asked what their yield was some years ago and what they are realizing now irrespective of their years of experience. It was revealed that the major crop grown in the study area is rice, so their responses were based on this.

The result presented on Table 4 shows that 41.7% and 40% in Lafiagi and Shonga respectively had above 5bags before while only 7.7% and 6% in Lafiagi and Shonga respectively had above 5bags presently. This according to them is as a result of alteration in the climatic parameters.

Table 4: Crop yield (bags) Before and After

Yield	Frequency		Cumulative
	Percentage		percentage
Before			
(Lafiagi)			
1-3bags	10	3.3	3.3
3-5bags	15	5	8.3
Above 5bags	125	41.7	50
Shonga			
1-3bags	8	2.7	52.7
3-5bags	22	7.3	60
Above 5bags	120	40	100
Total	300	100	
After			
Lafiagi			
1-3bags	63	21	21
3-5bags	64	21.3	42.3
Above 5bags	23	7.7	50
Shonga			
1-3bags	77	25.7	75.7
3-5bags	55	18.3	94
Above 5bags	18	6	100
Total	300	100	

Source: Author's Research 2012

Adaptation Strategies

Various adaptation strategies against the negative impacts of climate change were adopted by the respondents as revealed in Table 5. For instance, 51.7% adapted planting different types of crops to cushion the effects of

climate change. Other strategies adapted include planting of cover crops (15%), changing from planting crops to livestock keeping (4%), soil conservation (8.3%), changing the types of crops planted (12.7%), move to another site (5%), pray to God (3.3%).

Table 5: Adaptation Strategies to Climate Change

Strategies	Frequency	Percentage	Cumulative Percentage
Planting of cover crops	45	15	15
Planting different types of crop	155	51.7	66.7
Change from crops to livestock	12	4	70.7
Irrigation	-	-	-
Soil conservation	25	8.3	79
Changing amount of land cultivated	-	-	-
Changing the types of crops	38	12.7	91.7
Move to another site	15	5	96.7
Change occupation	-	-	-
Others (Pray to God)	10	3.3	100
Total	300	100	

Source: Author's Research 2012

Conclusion and Recommendations

Climate change no doubt affects agricultural production generally in the study area. This has led to reduction and loss of crops grown. Women however, adapt to changes in the climate through various ways such as planting different crops, cover crops and moving to another site. The implication of this is that rural women farmers' methods of adaptation to climate change can be adopted in similar communities. Furthermore, changes in climatic conditions and adaptation measures should be communicated very well to women through weather forecast on the media. Rural women with local ideas should be allowed to be part of climate change negotiations processes in order to learn from their indigenous knowledge on how to adapt and mitigate the effects of climate change. Men and women's roles in adaptation to climate change should be studied in order to ascertain who to give safety nets during climate disasters.

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