

GENDER AND CLIMATE CHANGE IN NIGERIA

A STUDY OF FOUR COMMUNITIES IN NORTH-CENTRAL AND SOUTH-EASTERN NIGERIA



(Photo by Dr. Julia Agwu)

Authors:

Agwu, Julia,
Natural Science Unit, School of General Studies, University of Nigeria, Nsukka

Okhimamhe, Appollonia A. (PhD),
Centre for Climate Change and Freshwater Resources, Federal University of Technology, Minna,

Copyright ©Heinrich Böll Stiftung (HBS), 2009

All Rights reserved

Heinrich Böll Stiftung (HBS),
16A Oladipo Diya Street, 2nd Avenue Extension Estate,
Ikoyi, Lagos , Nigeria

Tel: + 234 (0) 1-7612353

E-mail: info@boellnigeria.org

Web: www.boellnigeria.org

ISBN: 978 - 978 – 904 – 502 - 0

PREFACE

Climate change is one of the most urgent issues of our time with widespread implications for the earth's ecosystems and human development across sectors. From the exacerbation of poverty, to the breakdown of infrastructure, to the loss of environmental, political, economic and social security, the impacts of climate change are extensive. However, a critical aspect is missing when discussing climate change, especially during roundtable policy negotiations: the gender perspective.

Although gender equality and women's empowerment are acknowledged pre-requisites for sustainable development, climate change policies neglect these important issues. The UN Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, focus predominantly on mitigation but, while the reality and impacts of climate change are widely visible and their causes recognised, mitigating the effects is only part of the solution. In Nigeria and other communities around the world the impacts of climate change are being felt, and urgent adaptation to these changes need to be given priority at the national and community levels. As managers of natural resources and caretakers of their communities, women need to be at the forefront of change.

Policy makers have identified the lack of gender desegregated data as a major challenge in bringing gender on the climate change agenda. Women's perspectives must be included in climate change policy making at all levels and lessons learned must inform global policy making. There is a pressing need for this to happen given the major upcoming events such as the expiration of the Kyoto Protocol in 2012 and the UNFCCC's 15th Conference of Parties in December 2009 in Copenhagen. Women's expertise must be highlighted and must contribute to both mitigation and adaptation strategies.

This study was carried out to assess the impact of climate change on local communities from a gender perspective as well as make recommendation on how to combat the local consequences (adaptation measures) using the relevant local institutions/agents which also needed to be identified. It makes available much needed gender desegregated data on the impact of climate change thereby contributing towards filling the gap on the gender dimensions of climate change and feed the on-going discourse on climate change as Nigeria prepares for the UNFCCC's 15th Conference of Parties.

This publication was commissioned by the Heinrich Böll Foundation, Nigeria. It captures the impact of climate change on men and women in characteristic disaster areas of the South-Eastern and North-Central regions of Nigeria. It therefore provides good reference material for further research and advocacy on the subject. It is hoped that it will go a long way into genderising the discourse on climate change in Nigeria.

Uju Obiora

Program Manager, Women's Rights

Heinrich Böll Foundation

Lagos, Nigeria

November 2009

ACKNOWLEDGEMENTS

Heinrich Böll Stiftung (HBS) acknowledges the efforts of the two researchers who carried out in-depth studies: Julia Agwu of the University of Nigeria, Nsukka and Appollonia Okhimamhe of the Federal University of Technology, Minna. It is also grateful for the important contributions of research/field assistants who kept the participants engaged during the Focus Group Discussions.

We also acknowledge the logistical support of our partner organisations in the study locations, Civil Resource Development and Documentation Centre (CIRDDOC) and Khaliben Consult.

Finally, the community members, especially the women of Enugu Nanka in Anambra State, Akama Amankwo in Enugu State, Augie in Kebbi state and Zuma in Niger State whose enthusiasm and support enhanced the success of this study.

EXECUTIVE SUMMARY

Two studies on the gender dimensions of climate change were conducted from July to August 2009 in the North-Central parts and South-Eastern of Nigeria.

The North-Central study assessed the impact of climate change on the Zumba and Augie communities in Niger and Kebbi states respectively. It equally tackles the issue from a gender perspective which highlights the challenges and adaptation strategies of the selected communities.

From this study, it was observed that communities had noticed changes in climate but failed to identify their causes. For example, despite observing the increase in temperature and shortening of the rainy season over the past four decades, Zumba women attributed the degradation of their environment primarily to the construction of the Shiroro dam and the resulting massive deforestation. Less scientifically, the Augie women believed that the flood waters from Bakolori and Goronyo dams which destroy their farms and affect the health of their people were calamities inflicted by God.

Women accepted that they had contributed to deforestation in their search of fire wood which led to the disappearance of many plant and animal species. Although these resilient communities have put various adaptation measures in place, they were not primarily targeted at reducing the impact of climate change. The Augie community is already practicing a number of coping strategies and requesting for assistance to strengthen them. Specifically, the stakeholders of the community requested for funding, awareness campaigns and capacity building. In Zumba, awareness campaigns would also need to address traditional beliefs.

The South-Eastern study focused on two communities; Enugwu Nanka in Anambra State and Akama Amankwo Ngwo in Enugu State. The study revealed that impacts of climate change observed in South-Eastern Nigeria are: the destruction of shelter (both human and animal), arable farmlands, access roads and economic trees by landslides and tornadoes. Climate change is also responsible for excessive heat, heightened insect activity and the drying up of streams.

Though awareness about climate change is generally low, women were found to be more knowledgeable than their male counterparts of the same age brackets because they tend to live off the

exploitation of the land. Women only earn between N3, 394 (\$20) and N5, 918.6 (\$40) per month on average, for the sampled communities in Anambra and Enugu States respectively. Meanwhile, their roles include giving birth, taking care of their children and husbands, educating their children, growing food and cooking, washing, cleaning and providing water for their families. Indeed, low income, coupled with prevalent gender inequalities, exacerbates women's vulnerability to the impacts of climate change. The social impacts of climate change such as male migration also increase the workload of the women in both localities, they expose them to physical and sexual abuse as they scramble for depleting commodities and encourage early marriages.

While ingenious adaptive and mitigation strategies developed by women were encountered in sample states, better policy making to combat climate change is desperately needed as the study showed that Nigeria is clearly unprepared for the environmental disasters which accompany climate change. If policy makers have ignored the way climate change affects men and women differently, it is mostly due to inadequate communication and collaboration between the affected communities and their governments.

**CLIMATE CHANGE, ITS IMPACTS AND ADAPTATION: GENDERED PERSPECTIVE
FROM NORTHERN NIGERIA**

By Okhimamhe, Appollonia A. (PhD)



(Photos by Appollonia Okimamhe – PhD)

1.0 INTRODUCTION

This study looks at the impact of climate change in the Augie and Zumba communities of Kebbi and Niger States respectively, from a gender perspective. It highlights the constraints faced by the selected communities and adaptation strategies they have adopted.

The primary goal of this study is to contribute to the on-going discourse on climate change as the country strategises towards UNFCCC's 15th Conference of Parties in December 2009. However, in the process of conducting this study, awareness was created among the participating local communities and various stakeholders on the effects of human action on climate change. It also encouraged them to reflect on the most appropriate mitigation and adaptation strategies for their own environment.

2.0 ABOUT THE STUDY

For the study, focus group discussions were used in gathering relevant information. Participants were grouped according to gender and included community leaders, religious leaders, representatives of various livelihoods and women leaders who had resided within the communities for 20 to 40 years.

Tools such as timeline analysis and ranking were also used during the discussions to provide information on transformations that had occurred and prioritise the community's environmental concerns. The community focused on hazards that had the most impact on access to natural resources and livelihood. Pertinent literature on current trends in climate change and on gender dimensions from a global, sub-Saharan African and Nigerian perspective was reviewed. Lastly, semi-structured interviews were conducted with representatives of NGOs, policy makers and other pertinent stakeholders.

2.1. Kebbi State

2.1.1. Geography and Climate

Created from the former Sokoto State in 1991, Kebbi State (see figure 1.1) is located between latitude 10°N to 13°N, and longitude 3°E to 6°E in North-Western Nigeria with its capital at Birnin Kebbi. It shares boundaries with Sokoto, Niger and Zamfara States as well as Dosso Region in Niger Republic and covers an area of 36,800 sq km. There are 225 political wards, 3000 settlements and 1036 hard-to-reach settlements in the 21 local governments in the state. The case study selected is Augie community which is located within Augie Local Government Area in the northern part of Kebbi State. The state's four major ethnic groups are: Hausa, Fulani, Dakarkari and Gungawa. The rural dwellers' main livelihoods include farming, fishing and animal rearing.

The geology of Kebbi State is dominated by two formations of pre-Cambrian Basement Complex in the south and south east and young sedimentary rocks in the north, and the relief can be divided into three relief regions: the high plains in the south and south east, the plain landscape in the north and the riverine lowland of the Niger and lower Rima valleys. These have control over the type of soil found in the state. The two categories of soils in the northern part are the upland and fadama soils, which are generally characteristic of the entire Sokoto-Rima Basin. While the upland soils are sandy and well drained, the fadama soils are generally clayey and hydro-morphic. In the south and south-eastern parts, there are the ferruginous tropical soils, black cotton soils and lithosols which are subject to stripping by erosion as a result of topographic characteristics typical of the area. The natural vegetation of the State comprises Sudan Savannah in the north and Northern Guinea Savannah in the south and southeast. However, years of intensive cultivation, grazing, fuelwood extraction and bush burning have transformed the vegetation into a form of parkland dominated by trees like *Piliostigma*, *Ziziphus*, *Mangifera Indica* and *Tamarindus*, especially in the south.

Two major rivers drain the state: River Niger in the generally rocky south traversing the state from Benin Republic up to Ngaski LGA, and River Rima in the sandy north passing through Argungu to Bagudo LGA where it empties into River Niger. The Rima itself flows in a broad sweeping valley through the sedimentary area and then into the River Niger in the south west, creating extensive flood plains that have no semblance to present discharges. Kebbi State has a tropical continental-type climate with a wet season that lasts from April to October in the south and from May to September in the north—the dry

season lasts for the remaining period of the year. Mean annual rainfall is about 800mm in the north and 1000mm in the south; and temperature is generally high with mean annual temperature of about 26°C in all locations. But during the harmattan season (December to February) the temperature can go as low as about 21°C; between April and June, it can rise as high as 40°C.

2.1.2. Environmental issues

Desertification is one of the major environmental problems in Kebbi State manifesting itself through incidences of wind erosion, dune accumulation and exposure of lateritic ironstone on the landscape. It is the product of a number of factors, both natural and man-made. Some of these factors include limited rainfall, excessive sourcing for fuel wood and indigenous methods of cultivation and grazing techniques. All these have combined to deprive the environment of its natural vegetation, thus accelerating the incidence of soil erosion in addition to the recurrent drought characterised by its below average annual rainfall and uneven distribution. Furthermore, there are no functional edicts to curtail bush-burning and wood cuttings. Other ecological problems afflicting the state include those of flooding, pest infestation and gullies. Flooding has caused devastation of croplands within the flood plains, of settlements bordering them and loss of lives. Pest problems tend to be more pronounced during periods of long cessation of rains during the wet season (<http://www.onlinenigeria.com>).

2.2. Niger State

2.2.1. Geography and Climate

Niger State is located (Fig. 1.1) in the North Central Geopolitical zone of Nigeria on 3.20°E and longitude 11.30°N with Kaduna State, Federal Capital Territory, Zamfara, Kebbi, Kogi and Kwara as her neighbours in the north-east, south-east, north, west, south and south-west respectively. The Republic of Benin borders Niger State to the north west. The state's population is 3,950,249, living on a land mass of about 74,244 sq km (8% of Nigeria) and covering 25 Local Government Areas. About 85% of the people of Niger are farmers who cultivate rice, yams, sorghum, maize, groundnuts, beans, cassava, sugar cane, melon and millet. The three main ethnic groups are: Gwari, Nupe and Hausa. The state is drained by rivers Niger, Kaduna, Gbako, Eko, Gurara, Ebba, Ega and Mariga.

Niger State, like other states on the same latitude, is covered by two major rock formations the sedimentary and basement complex rocks. The sedimentary rocks to the south are characterised of

sandstones and alluvial deposits, particularly along the Niger valley and in most parts of Borgu, Bida, Agaie, Lapai, Mokwa, Lavun, Gbako and Wushishi LGAs creating the extensive flood plains which has made the state one of the largest and most fertile agricultural lands in the country and the best area for rice growing in Nigeria. The basement complex in the north is characterised by inselbergs which dominate the landscape in Rafi, Shiroro, Minna, Mariga and Gurara.

2.2.2. Environmental Issues

Niger State has two distinct seasons: the dry and wet seasons. The annual rainfall ranges from 1,200 - 1,600mm in the north and south respectively. The duration of the rainy season ranges from 150 - 210 days or more from the north to the south. There are three main types of soil: ferruginous tropical soils, hydro-morphic soils and ferrosols. The most predominant soil type is the ferruginous tropical soils which are basically derived from the Basement Complex rocks, as well as from old sedimentary rocks and are ideal for the cultivation of guinea corn, maize, millet and groundnut. The Southern Guinea Savannah vegetation covers the entire landscape of the state and is characterized by woodlands and tall grasses interspersed with tall dense species. The major ecological problem in the state is flooding, particularly when the Niger River overflows its banks. Uncontrolled bush burning and deforestation is another ecological problem in the State (<http://www.onlinenigeria.com>).

2.3. The relationship between climate change and gender

An analysis of distributive impacts of the environment on human wellbeing cannot ignore features such as gender (UNEP 2007) because of the persistent and global inequalities that perpetuate poverty. Women bear the burdens created by environmental degradation, disproportionately to men, and a vicious cycle exists between this reality and climate change. It has become an accepted fact that environmental degradation has led to climate change which in turn exacerbates existing degradation. Discussing the gender dimensions of climate change is a very recent development starting with COP 8 that held in New Delhi in October 2002. However, COP 13 was a very important conference that led towards the promotion of gender equality as concerted efforts were made by the Network of Women Ministers and Leaders for Environment to incorporate the gender theme in the negotiations that took place. Gender is defined as “the differences in socially constructed roles and opportunities associated with being a woman or a man and the interactions and social relations between women and men.” It influences social expectations, values and what society perceives as normal.

The gender approach (or analysis) takes into consideration the fact that women and men react to and participate in social, economic and environmental realities differently depending on their age, socio-economic status and culture (UNDP 2008). Consequently, two key issues are brought to light. First, women and men have different interests and needs, and are obliged to acquire different capacities and knowledge. Secondly, the approach seeks to transform gender identities and unjust relations with the objective of establishing equitable relations between women and men. Equity is “the possibility of differential treatments to correct innate inequalities: measures that are not necessarily equal but that result in equality in terms of rights, benefits, obligations and opportunities.” Gender equality presupposes that the different behaviours, aspirations and needs of women and men are equally valued and favoured. This gender approach to understanding climate change has become critical as equal consideration should be given to appropriate adaptation strategies. This is a vital element in reducing the vulnerability of climate-induced change while protecting and enhancing the livelihoods of the poor, both women and men (Soussain, Burton and Hamilton 2003).

Taking gender into consideration provides better guidance for women and men who are building adaptive capacity in places where inhabitants depend on rain-fed agriculture and natural resources—they are the most vulnerable to climate change. A critical view of gender dimensions of climate change using case studies across the globe will provide critical gender-disaggregated data on climate change impacts, vulnerability and risks for climate change policy makers, which had been neglected until recently (Lambrous and Piana 2006a). Though, collecting this type of data is laborious, it is critical if development interventions are to be well-targeted and successful.

This holistic approach to climate change will ensure that the focus of solutions emphasises technical, social and political perspectives (Masika 2002) of climate change impact on agriculture and food security, forests and water resources. An approach that puts men and women in the same basket is incomplete and likewise, one that considers women’s situation alone will not bring about the transformation needed to curb climate change (UNDP 2008). Thorough and truly satisfactory research would require in-depth understanding of how climate change can exacerbate the existing inequalities between women and men; and how these inequalities can intensify the impacts of climate change for individuals and communities (DFID/BRIDGE 2008).

The report of IPCC (2001) not only pointed out that the impacts of climate change will be differently distributed among different regions, generations, ages, classes, income groups, occupations and sexes but also affirmed that inequalities in wellbeing and in access to food, clean water and other resources will be exacerbated by the disproportionate impact of climate change on less developed countries and people living in poverty in all countries. If we continue to ignore its causes and effects, climate change may increase inequalities globally. Consequently, it is only a matter of justice and respect for human rights to ensure every demographic, including poor rural women, participate in climate change discourse and research. Their voices must be heard and taken into consideration when making decisions and policies about climate change making (UNDP 2008). The importance of using gender disaggregated data on planning climate change adaptation and mitigation options is further justified by a number of United Nation's instruments to promote international human rights, starting with the 1940's UN Charter and the Universal Declaration of Human Rights recognising equality of rights and fundamental freedoms of each man and each woman and emphasizing the protection of the dignity of persons, among others.

The MDGs also emphasise the importance of gender dimensions of climate change including MDG 3 which seeks to promote gender equality and the empowerment of women (Aguilar *et al.* 2007; Dankelman *et al.* 2008, UNDP 2003 and Oxfam 2005). The Global Gender and Climate Alliance (GGCA) is an alliance comprising of UNEP, UNDP, IUCN and WEDO that was launched during COP 13 for the promotion of gender equality on issues of global climate change. The Alliance, among others, organised, high profile advocacy during COP 14 at Poznan.

Various gender equality advocacy groups, among others, have called for mainstreaming gender which ECOSOC (1997) defines as the process of assessing the implications for women and men of planned action, policy or programme, in all areas and all levels. It is a process that ensures that the marginalised are brought to the centre of the decision-making process. In this case, it is a process that brings women from the periphery of climate change decision making to the core, thereby minimising the inequality being perpetuated by their exclusion. Gender mainstreaming is a cross-cutting issue in climate change discourse.

The Women's Major group at the 14th Meeting of the UN Commission on Sustainable Development in 2006 (among others) has given the negotiators reasons to mainstream gender by drawing attention to the specific gender characteristics of climate change. In a nutshell, they pointed out that women are

affected differently by the effects of climate change and by extreme climate events that often translate into disasters because of their social roles, discrimination and poverty; that women are insufficiently represented in decision-making processes on climate change, adaptation and mitigation strategies; and that women must be included, not because they are 'more vulnerable' but because they have different perspectives and experiences to contribute (UNDP 2008).

2.4. Critical statistics of relevance to climate change in Nigeria

Within the sub-Saharan region, Nigeria has to contend with the various environmental problems, particularly the encroaching desert from the north and coastal inundation (due to rising sea levels) from the south. Eleven out of the thirty-six states in the country referred to as the 'frontline states' are gradually being 'swallowed-up' by desertification, while sea level rise is slowly 'eating-away' the eight coastal states. These are states where the impact of climate change is expected to be severe because it will exacerbate the existing environmental degradation. By 1985, deforestation claimed 1,544 sq miles of the nation's forest land. Between 1983 and 1993 alone, Nigeria lost 20% of its forest and woodland areas. In Northern Nigeria, especially the Sudan Sahelian region, where desertification is a key environmental problem, droughts have been reoccurring for the past three decades (IRIN 2005) thereby affecting food security and increasing cardio-respiratory health issues resulting from the increasing dust pollution. During the Environment Summit that held last year (2008), President Umaru Musa Yar'adua announced that the country's annual losses stemming from environmental degradation (combating land degradation, deforestation, drought and desertification, loss of biodiversity, flooding, erosion, urban decay and municipal waste disposal and the adverse effect of climate change) adds up to approximately US\$5.1 billion.

Given that Nigeria, a sub-Saharan country, is the 39th largest country in the world with the 9th largest population, reducing the impacts of climate change and related issues must be given priority if the various developmental plans (e.g. NEEDS, 7-point Agenda) of the country must be successful. Otherwise, socio-economic crises of catastrophic proportion will be unleashed on, not just Africa, but the world as a whole. With an estimated 149,000,000 million people living within a land mass of approximately 923,800 sq km, i.e. about 14% of the land area of West Africa, any displacement of this mass of people will be felt globally especially as over 70% of this population is living below poverty lines in mainly rural areas. Using the 2006 census figures, it was observed that an estimated 49% of the population are

women and this constitutes about 7.3% of African population (Okhimamhe 2008). Mainstreaming gender issues in climate change will ensure that women, the primary custodians of environmental resources by virtue of their position in the household, will take up the responsibility of managing energy, water resources and farming (UNEP 2006). Unfortunately, the existing gender inequalities (in accessing basic facilities, differences in income, extent of social and political inclusion as well as socio-cultural factors) is a major obstacle to the choices made based on the acquisition of knowledge and skills in the two main ways of reducing the impacts of climate change: adaptation and mitigation.

Like most countries in Africa, Nigeria has a low rank (0.456) in Gender-related Development Index (GDI) of 139th position as against 157 countries. Though in comparison to GDI and global average, there is a marked improvement in Gender Empowerment Measure (GEM). While GDI focuses on levels of development including life expectancy, literacy, education and income; GEM reflects the extent of social inclusion through political participation, economic and decision making power as well as power over economic resources (UNDP 2005; UNDP 2007). Table 2.1 shows critical gender disaggregated socio-economic data on Nigeria. A quick glance at the table shows statistics on the existing social inequalities between women and men.

3.0 CLIMATE CHANGE, ITS IMPACTS AND ADAPTATION STRATEGIES: GENDERED PERCEPTION FROM ZUMBA COMMUNITY, NIGER STATE

This chapter describes the study conducted in Zumba community of Niger State. It identifies the environmental degradation caused by climate change in the community and the socio-economic consequences on communities from a gendered perspective. Based on the information provided during the Focus Group Discussion (FGD) and semi-structured interviews with key stakeholders such as policy makers, Non Governmental Organisations (NGOs)/Community Based Organisations (CBOs)/Voluntary Services Organisations (VSOs) and development partners, among others, an action plan has been prepared for the community to develop their local mitigation and adaptation strategies. To develop the action plan, current adaptation and mitigation strategies were identified, prioritised, and current constraints were highlighted.

3.1 ENVIRONMENTAL DEGRADATION AND CHANGES:

The discussants identified major environmental problems affecting their community over a period of forty years while residing in Old Zumba, a community that was resettled to its present location in New Zumba, more than two decades ago. Both women and men recalled that the following problems of environmental degradation, which they had identified as flood, erosion, drought, deforestation, overgrazed land, windstorm and heat wave were either barely noticeable or non-existent forty years ago. In the 1970s, they observed that rainfall was more stable and frequent and the temperature was low (not as high as the current situation). The land was fertile and vegetation was dense with diverse species of plants and abundant wild life while domesticated animals had large grazing land to feed from and roam freely. Two decades after relocation to New Zumba, heat wave, deforestation, floods and windstorms had become a major source of concern while currently; droughts and erosion have intensified. Over the years, there was a gradual drying up of available surface water and vegetation, leading to water scarcity and loss of biodiversity respectively. Furthermore, the intensity of windstorms increased as the effects of vegetation cover is reduced. Figure 3.1 shows the ranking of each of these elements of environmental degradation through gendered lenses.

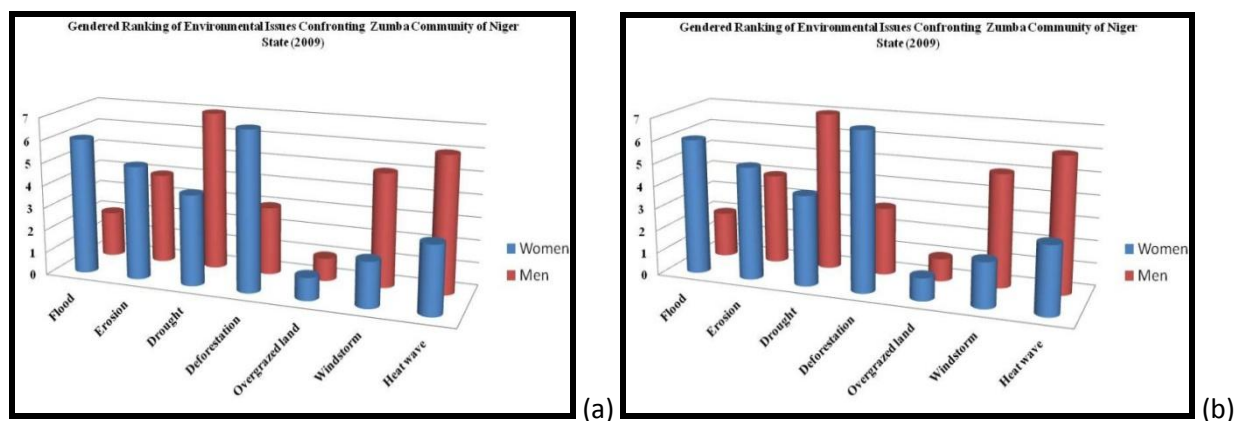


Figure 3.1 Degree of gendered impact of environmental degradation in Zumba in 1990s and 2009. Note that the highest figure indicates a highest impact.

3.2 IDENTIFICATION OF ENVIRONMENTAL PROBLEMS, RELATIONSHIP WITH CLIMATE CHANGE, THEIR CONSEQUENCES AND PERCEIVED CHANGES IN ZUMBA

During the Focus Group Discussion in Zumba (Fig. 3.2), seven main environmental problems of great concern to them were identified based on their impact on their livelihood, health and access to natural resources (Fig 3.1 above). They were asked to identify the environmental consequences of these problems on their community. This was done but it was observed that the women emphasised more on the consequences of these problems on farming, deforestation and the availability of surface water. It was very clear that these were the areas that affected their daily activities as caregivers and income earners. The discussants also listed the changes resulting from the environmental problems they had highlighted over the period of the study (Table 3.1).



Figure 3.2 Focus Group Discussion participants in Zumba community

Despite observing the increase in temperature and reduction in length of rainy season due to the late commencement of rainfall from March to May over the past four decades, the discussants attributed the degradation of their environment primarily to the construction of the Shiroro dam and the massive deforestation that occurred as a result. The women had explained that this massive deforestation took place to accommodate the high population people being resettled in New Zumba by the merging of about five villages. Consequently, a number of plants and animals were destroyed leading to the disappearance of some of them within Zumba environment. The trees not only served as raw materials for construction but also fuel wood. Table 3.2 identifies these changes based on sectors and their causes based on the perception of the community. Using the information provided by the discussants, the issue of climate change, its anthropogenic causes and relationship with environmental degradation was briefly introduced as a prelude to discussions on adaptation or coping strategies adopted by women and men in Zumba. The participants informed the research team that they were just being introduced to the problem of climate change.

Table 3.1 Environmental Problems, Consequences and Changes in Zumba (1970-2009)

Environmental Problem	Environmental consequences on agriculture/food security, biodiversity, water resources	Perceived Changes
Flooding	Washes away farmlands and crops; drowns animals; fishing nets and other equipment; destroys fishes and fingerlings; destroys burrowing animals etc.	Exposure of scarce, less fertile land to erosion;
Erosion	Washes away top soils and causes damage to the roads	Exposure of scarce, less fertile land to further degradation
Drought	Destroys plants and animals; reduced availability of water etc.	Increase in temperature; reduction in rainfall amount, intensity and duration etc;
Deforestation	Removal of economic trees, exposure of top soil to erosion by both wind and water; increased wind speed	Exposure of scarce, less fertile land to erosion; destruction of quality and quantity of biodiversity (e.g. plants, animals and fish); increased intensity of windstorms
Overgrazing	Exposes top soil to erosion, soil degradation and degrades pasture land; destroys fertile farmlands.	Exposure of scarce, less fertile land to erosion; reduction in pasture land for grazing
Windstorm	Destroys animals and crops	Exposure of scarce, less fertile land to erosion;
Heat wave	Dries up shallow ponds	Increased temperature and stillness of air

Table 3.2 Sector-based Changes and their causes as identified by Zumba Community

Sector	Perceived Changes	Causes
Land	Less fertile; reduced availability; increase in erosion;	Dam construction; deforestation and population pressure
Water	Less available and poor quality;	Dam construction; deforestation
Atmosphere	Increased temperature and wind speeds; early cessation of rains; reduced rainfall amount and intensity;	Desertification, deforestation, population pressure, increase in number of hot days arising from insufficient rainfall;
Vegetation	Drastic reduction and complete disappearance of some plant and animal species; reduction in the quality (less tasty), quantity and size of fish;	Non conducive habitat due to dam construction; Deforestation; and hunting (poaching)

On questions related to temperature and rainfall, the participants were unanimous in their observation that over the years, there has been an increase in temperature and that rainfall amount and the duration of the rainy season had reduced, as well. They pointed out that, about two decades ago, beginning of the rains was in March while currently, it begins in May. The men were particularly concerned about the impact of high temperature on yam harvest as this makes the yams stored in barns rot faster than normal. Women complained of increased heat stress and exhaustion during the peak of the dry season (Table 3.3). Women were able to recall past extreme climate events that had drastic impact on the community. For example, there was the case of a heat wave that lasted for about three weeks, twenty years ago. Several lives were lost, particularly elderly women and children. Similarly, within the same period, a devastating flood occurred that destroyed crops and washed away some houses. One of the elderly female participants who narrated the story recalled that they had initially thought the flood was a mermaid leaving the body of water to claim their lives. This led to massive mayhem with everyone running for dear lives!

3.3. SOCIO-ECONOMIC CONSEQUENCES OF CLIMATE CHANGE IN ZUMBA

When the socio-economic impacts of the environmental problems stated by the participants in the Focus Group Discussion were compared, only two appeared to be of peculiar concern of the men folk: hunting had become a livelihood of the past and the fact that yams rot faster during periods of high temperature, which were becoming more frequent compared to previous years. These, like all others

indicated in Table 3.4, have resulted in reduced earnings. In addition, men migrate to other rural areas because of the uncertainty in employment opportunities in urban areas. Women were more concerned about the fact that if they have to travel longer distances to fetch fuel wood, they would be prevented from attending to other activities in their homes. However, there were laws against felling of economic trees such as shea butter, mangoes etc. Forestry officers and community representatives usually conducted surveillance to deter would-be offenders, whom when caught are fined heavily to prevent future re-occurrence. The alternative for the women is fuel wood purchase and this has become increasingly expensive as meagre resources that could have been used to feed the family are utilised for this purpose.

On health issues, women listed malaria, hypertension, ulcer, diarrhoea, asthma and diabetes as new ailments that were ushered in by the changing climate, with malaria being the most widespread. Thirty years ago, they relied on local herbs for treating illnesses, but now, they have to go to nearby fairly functional clinics for treatment especially because the herbs are no longer available. Most drugs have to be purchased outside these health facilities, though maternal health care is available for pregnant women.

Table 3.3 Gender sensitive socio-economic impacts of climate change in Zumba (1970-2009)

Climate Parameter	Status over a period of 40 years	Socio-economic impact
Temperature	Had increased over the years most especially affecting drinking water supplies, human and animal health (causing discomfort); caused reduction in crop yield	The men complained that preserved yams rot faster, thereby reducing the amount of money to be earned from sales; the women recalled the incidence of heat wave that occurred about 20 years ago that lasted for about two to three weeks resulting in heat exhaustion and stress, killing both human beings and animals;
Rainfall	Had decreased in amount and duration affecting crop yield except when irrigation is used; low availability of portable water; occurrence of drought; low vegetation growth; increase in flooding due to less infiltration capacity and more run off causing erosion;	Women purchase water (no wells, the only borehole existing now is used is on rotational basis and the others are not been functional; two streams for washing: rainy season pond and rain water harvesting); they also have to go longer distances to fetch fuel wood or rely on millet stalk for cooking; Dearth of herbs for treating ailments; generally low earning power; reduced earnings and high cost of foodstuff; During floods, water becomes contaminated and causes diarrhea amongst mostly women and children; washing away of crops from floods results in reduced earnings and increased spending on food, low employment, increased diarrhea, malaria; Reduced earnings from using infertile land, increase in cost of farming (fertilizer etc); For the men, there are no animals to hunt and sell (reduced earnings);

Table 3.4 Socio-economic consequences of climate change and environmental degradation

Environmental Problem	Environmental consequences agriculture/ food security, biodiversity, water resources	Socio - economic consequences	
		Women	Men
Flooding	Washes away farmlands and crops; drowns animals; fishing nets and other equipment; destroys fishes and fingerlings; destroys burrowing animals etc.	Reduced earnings and increased spending on food, low employment, increased diarrhea, malaria	
Erosion	Washes away top soils and causes damage to the roads	Reduced earnings from using infertile land, increase in cost of farming (fertilizer etc)	
Drought	Destroys plants and animals, results in high temperature and causes water scarcity (quantity and quality) etc.	Malnutrition and famine; hypertension; reduced earnings and high cost of foodstuff: buy water (no wells, borehole where use is on rotational basis and some have not been functional, two streams: rainy season pond and rain water harvesting);	
Deforestation	Removal of economic trees, exposure of top soil to erosion by both wind and water, results in increase in temperatures wind speed etc.	Dearth of local herbs for treating ailments; reduced earnings; travel further to gather wood (fatigue); buy fuel wood	No animals to hunt and sell (reduced earnings);
Overgrazing	Exposes top soil to erosion, soil degradation and degrades pasture land; destroys fertile farmlands.	Reduced earnings from using infertile land, increase in cost of farming (fertilizer etc); migration	
Windstorm	Destroys animals and crops	Increased incidences of asthma attacks (cardio-respiratory diseases)	
Heat wave	preserved yams rot faster	Kills the aged, women and children;)	less earning from sales of yams; heat stress;

3.4 ADAPTATION (OR COPING) STRATEGIES BY WOMEN AND MEN IN ZUMBA

To cope with the changing climate in Zumba, in the absence of fuel wood, the women use maize or guinea corn stalk for cooking. However, the smoke affects the aroma and taste of the food prepared in this manner and it also requires that the fire be tended to constantly. This prevents the woman from attending to other activities or as an alternative, the task is assigned to the girl child (the automatic choice for a helper). In addition, despite the fact that Zumba community is close to the Shiroro dam, drinking water is increasingly becoming scarce. To cope, the women have to either purchase a drum of water from the tankers owned by Power Holding Company of Nigeria Limited (PHCN) or queue up for hours to fetch water from the only functional borehole in the community. This borehole is used on a rotational basis i.e. each woman is allocated a particular time (like an informal time table) to fetch water, and if her supply gets exhausted before her time, she has to find an alternative. This could be to purchase from or exchange with another woman. For other household usage of water, they have two options: a stream that dries up during the dry season (for use in the rainy season) and a pond containing harvested rainwater (for use in the dry season). These have become inadequate for the community. The

problem is further compounded by the fact that there are no dug-out wells in the village (Table 3.5 has more details).

Table 3.5 Gender-based adaptation or coping strategies adopted by Zumba Community

COPING STRATEGIES	
WOMEN	MEN
In accessing energy: Use of maize or guinea corn stalk (no fuel wood except purchasing from neighbouring villages) but affects the taste and aroma of the food;	In accessing energy: Mostly taken care of by women and children take care of this
In accessing water: Used to buy from PHCN tanker at N50.00 per drum; Borehole used on rotational basis; two streams used for washing (rainy season pond and rain water harvesting); no single well existing	In accessing water: Digging wells in fadama areas during the dry season
On improving crop production: Early planting to avoid flooding from dam; planting of early maturing crops; irrigation farming or purchasing from markets	On improving crop production: Planting early maturing varieties of crops; early cultivation; finding off-farm jobs; employing soil conservation techniques (fallowing)
On enhancing livestock production: animals kept in the house, use drugs or dipping and sanitize environment to avoid disease	On enhancing livestock production: providing sheds for the animals; planting cowpeas and using feeding the animals with the leaves
On accessing fishery: No fisher women during the discussion, but the fisherwomen also cope in similar ways with the men	On accessing fishery: Use of smaller fishing mesh as the present day catch are smaller in size,

3.5 CONSTRAINTS IN IMPLEMENTING ADAPTATION (COPING) STRATEGIES

Although, the participants had indicated that some of the coping strategies had lost their effectiveness over the years, they had no alternatives to switch to. The research persons identified commonly used adaptation practises as options, which the community could adopt. The responses given are presented in Table 3.6. Most of the responses given by the women indicated that they either lacked the financial resources or information on the options available. The participants, mainly the males, complained about inadequate land resources to embark on a number of options, assuming they could access funds. However, both women and men said they lacked information on building water harvesting schemes, purchasing insurance policies and credit facilities or accessing new technologies. In addition, while the men did not believe they needed the services of extension workers, women lacked information on the

activities of extension workers. Poverty and access to information appears to be the bane of Zumba community in Niger State.

Table 3.6 Constraints in Implementing adaptation or coping strategies in Augie Community

Constraints in implementing adaptation strategies		
Constraints	Women	Men
(a) Lack of funds	Changing from cropping to livestock breeding; changing from fishing to livestock breeding; changing from fishing to farming; accessing new technologies; accessing credit facilities and planting shade trees.	Migrating to urban areas
(b) Lack of information	Building water harvesting schemes; insurance schemes, accessing new technologies; changing crop varieties, implementing soil conservation techniques; accessing credit facilities and accessing extension services.	Building water harvesting schemes; purchasing insurance; accessing new technologies and accessing credit facilities.
(c) Shortage of labour	None (labour abundant but no employment)	None (labour abundant but no employment)
(d) Others	No infrastructure for irrigation, migration to other rural areas, trading, possess no land to lease	Insufficient land to irrigate, uncertainty in changing from cropping to livestock breeding and reduction in number of livestock; No assurance of employment/livelihood in migrating to urban area; insufficient land to lease; insufficient land to change from fishing to farming; and no need for the services of extension workers since land is insufficient.

3.6 INTERVENTIONS FROM OTHER STAKEHOLDERS

In order to assess the extent of intervention from stakeholders in government, NGOs and CBO as well development partners, the research persons interviewed a few stakeholders. At the state level, there were a few activities targeted at environmental issues but none specifically for climate change adaptation or mitigation. Currently, Niger state has no domesticated policy on environment or climate change. However, some of the plans include the following:

- The policy of planting 25 million trees (1million per local government) across the state yearly and the development of, at least one nursery each in the three senatorial zones of the state.

- The constitution of a high level committee for the harmonization of controls for forestry losses is presently ongoing, and is to be coordinated by the State Ministry of Environment.
- The meeting being held with saw-millers to stop the activities of felling and burning of trees for charcoal.
- The state government is compelling local governments to embark on practical programmes aimed at combating climate change, especially the change resulting from desertification (particularly in the eight (8) local governments in zone C). However, the programme requires adequate funding and proper coordination through the establishment of climate change desks.
- Currently, Niger State Environmental Protection Agency (NISEPA) is working on a framework for a holistic environmental programme. All short term plans (actions) on the environment will be co-opted into 2010 budget.

Generally, the intervention of government at policy level could be rated as medium, though practically, the intervention is low. Credible NGOs are required to participate in the state's environmental activities related to climate change.

In rural communities, development partners (such as UNICEF) have been collaborating with the State Government in the provision of portable water supply by drilling boreholes. This will help reduce the hardship being experienced by the rural women and children in providing their homes with clean water. In all of these cases, the participation of women is very low and requires massive sensitisation to encourage attitudinal changes and awareness creation.

4.0 CLIMATE CHANGE, ITS IMPACTS AND ADAPTATION STRATEGIES: GENDERED PERCEPTION FROM AUGIE COMMUNITY IN KEBBI STATE

This chapter describes the study conducted in Augie community of Kebbi State. It identifies the environmental degradation caused by climate change in the community and the socio-economic consequences on communities from a gendered perspective. Based on the information provided during the Focus Group Discussion (FGD) and semi-structured interviews with key stakeholders such as policy makers, Non Governmental Organisations (NGOs)/Community Based Organisations (CBOs)/Voluntary Services Organisations (VSOs) and development partners, among others, an action plan has been prepared for the community to develop their local mitigation and adaptation strategies. To develop the action plan, current adaptation and mitigation strategies were identified, prioritised, and current constraints highlighted.

4.1 ENVIRONMENTAL DEGRADATION AND CHANGES

The participants of the Focus Group Discussion in Augie used timeline information to describe environmental transformation that had occurred in the area over a period of forty years. Four decades ago, Augie was surrounded by dense vegetation with abundant wild life and fruits, had access to several surface water bodies (but low availability of portable or pipe-borne water) with abundance of large fish species and large number of grazing cattle and domesticated donkeys. The rainfall was stable and frequent with normal seasonal floods of nearby rivers, temperature was lower than in the present day situation and there were no windstorms. In addition, grazing land was abundant and fertile with low land farming practised by most of the farmers. Crops such as rice, cassava and pumpkin got ripe early, were cultivated in abundance, tasty and had fine aroma. Rice was cultivated only once the year. By 1990, changes had begun to occur with desert encroachment steadily creeping in with incidences of droughts. Currently, however, sand dunes have crept in, droughts and floods occur more frequently and wind storms are frequent and intense. There are also high incidences of pest infestation (e.g. Quella birds, worms, grasshoppers etc). Upland farming has replaced low land cropping with more frequent use of inorganic fertilizer.

Both women and men listed the following as worrisome problems of environmental degradation: flood, erosion, drought, deforestation, desertification, overgrazed land, windstorm and heat wave, which were

either barely noticeable or non-existent forty years ago. Figure 4.1 shows the ranking of each of environmental problems in Augie through gendered lenses.

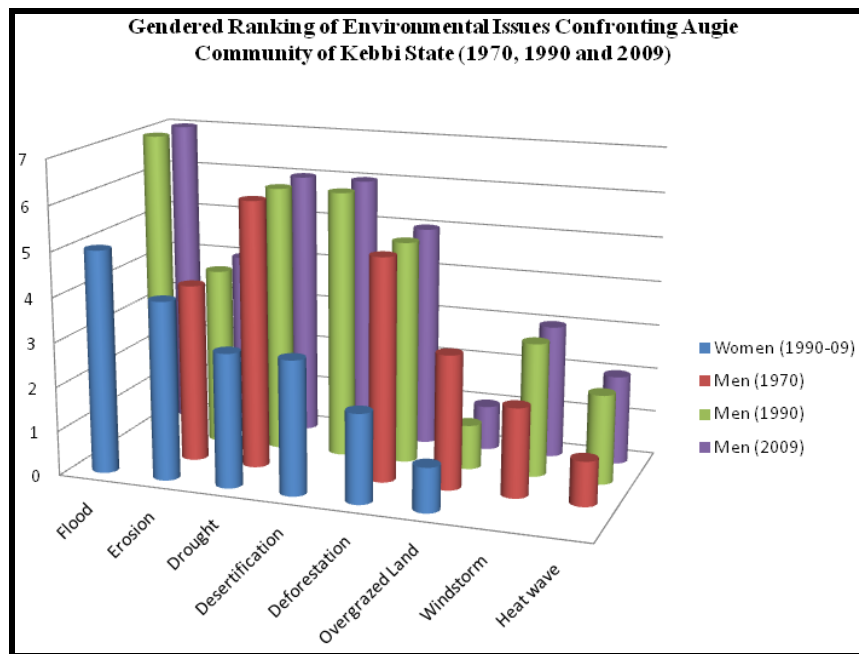


Figure 4.1 Degree of gendered impact of environmental degradation in Augie in 1970s, 1990s and 2009. Note that the highest bar indicates a highest impact.

4.2 IDENTIFICATION OF ENVIRONMENTAL PROBLEMS, RELATIONSHIP WITH CLIMATE CHANGE, THEIR CONSEQUENCES AND PERCEIVED CHANGES IN AUGIE

During the Focus Group Discussion in Augie, eight types of environmental problems with their consequences with the greatest impact on their livelihood, health and access to natural resources (see fig 4.1 above) were identified. To the women of Augie, the most critical environmental problems affecting them are floods, deforestation and erosion. They, however, believe that the problems were caused by God who released of flood waters from Bakolori dam. According to them, flood waters from Bakolori dam destroys farms and affects the health of members of the community. In addition, the women accepted that they had contributed greatly to deforestation. They chop down trees for fuel wood, and recognised that the activity had led to the disappearance many plant and animal species. The men ranked flooding, drought/desertification and deforestation as the three most critical environmental problems with the most severe impact on Augie. Women emphasised more on the consequences of these problems on flood deforestation and the availability of surface water. The discussants also listed

the changes resulting from the environmental problems they had highlighted over the period of study (Table 4.1).



Figure 4.2 Focus Group Discuss participants in Augie Community of Kebbi State

Table 4.1 Environmental Problems, Consequences and Changes in Augie (1970-2009)

Environmental Problem	Environmental consequences on agriculture/food security, biodiversity, water resources	Perceived Changes
Flooding	Washes away and submerges farmlands, crops and animals; contaminates water as during each flooding event, water takes about 40 days to recede	Exposure of scarce, less fertile land to erosion;
Erosion	Washes away top soils and causes damage to buildings and farmlands	Exposure of scarce, less fertile land to further degradation;
Drought	Destroys crops and livestock; reduction of vegetation cover; causes water scarcity (quality and quantity) etc.	Increase in temperature; reduction in rainfall amount, intensity and duration etc;
Desertification	Deposits sands on farmlands, accumulating as dunes; and kills animals.	Increased temperature, windstorms and scarcity of water; reduction in pastureland; exposure of scarce, less fertile lands to further degradation
Deforestation	Removal of trees, exposure of top soil to erosion by both wind and water; destruction of quality and quantity of biodiversity (e.g. Plants and animals);	Exposure of scarce, less fertile land to further degradation; increase in temperature and wind speed.
Overgrazed land	Exposes top soil to erosion, degrades pasture land and destroys fertile farmlands.	Exposure of scarce, less fertile land to further degradation; reduction in pastureland
Windstorm	Blows top soils away, uproots plants and destroys buildings	Exposure of scarce, less fertile land to further degradation;
Heat wave	Dries up shallow water bodies	Increased temperature causing discomfort to human beings and animals

Despite observing that temperature had increased and the length of the rainy season has reduced due to late commencement of rainfall from April/May to June/July in the past forty years, the discussants believe the changes being observed were from God and that nothing could be done to prevent the “will

of God being fulfilled". Table 4.2 identifies these changes based on sectors and their causes as highlighted by the discussants. Of particular interest is that Bakolori and Goronyo dams were seen as a mixed blessing to the community. First, is the fact that the release of flood waters provides water at least thrice a year for rice cultivation, but at the same time, this pollutes surface water bodies, among others. The problem of climate change, its anthropogenic causes and relationship with environmental degradation was briefly introduced as a prelude to discussions on adaptation or coping strategies adopted by women and men in Augie. This generated a very lively discussion as the research persons made efforts to explain the link between their activities and climate change.

Table 4.2 Sector-based Changes and their causes as identified by Augie Community

Sector	Perceived Changes	Causes
Land	Less fertile; reduced availability; non-availability of grazing reserves;	Desert encroachment (dune encroachment) ; drought; deforestation and population pressure
Water	Pollution of water downstream; decreased fish population and catch (due to trapping of larger fish upstream); frequent flooding (three times in a year) of farmlands and settlement; increase in weed in water; but quality of portable water has slightly increased due to availability of treated pipe borne water	Release of water from Bakolori and Goronyo dams located upstream;
Atmosphere	Increased temperature and wind speeds; early cessation of rains; reduced rainfall amount and intensity;	Desertification, deforestation, population pressure, increase in number of hot days arising from insufficient rainfall;
Vegetation	Drastic reduction and complete disappearance of some plant and animal species; reduction in the quality (less tasty), quantity and size of fish; higher incidences of pest infestation; reduction in fuel wood supplies	Deforestation, desert encroachment and hunting (poaching)

On questions related to temperature and rainfall, the participants were also unanimous in their observation that over the years, there has been an increase in temperature and that rainfall amount and the duration of the rainy season had reduced, as well. They pointed out that, previously, rainy season commenced in April/May in comparison to the current June/July. The women observed that temperatures had been consistently high for about five consecutive years, noting that each year appeared to be hotter than the previous one. In addition, they narrated the story of a flood event that occurred about 13-15 years ago from torrential rains that lasted for four days. The whole community was flooded and considered relocating. However, this idea was discarded as soon as the rains subsided.

They admitted that they did not protect themselves from the ravages of the flood. Most of the women and children were affected by diarrhoea from drinking contaminated water (Table 4.3). That flood event was nicknamed 'ruwan malali' by the community.

Table 4.3 Gender sensitive socio-economic impacts of climate change in Augie (1970-2009)

Climate Parameter	Status over a period of 40 years	Socio-economic impact
Temperature	Had increased over the years most affecting water supplies, human and animal health (causing discomfort); caused reduction in crop yield	Heat exhaustion and stress, the women had observed that temperature has been increasingly high for the last five years; and causing death of the aged, women and children; most sleep in the open air outside their homes during the peak of the heat leading to exposure to crawling insects (scorpions and ants), snakes etc
Rainfall	Had decreased in amount and duration affecting crop yield except when irrigation is used; availability of portable water; vegetation growth; reduced rainfall causes droughts; increase in flooding due to less infiltration capacity and more run off causing erosion;	Reduced availability of herbs for treating ailments; relatively stable earning ability but generally low; boreholes available but insufficient so women spend more time fetching water than in the past; they also have to go longer distances to fetch fuel wood or rely on millet stalk; during floods, water becomes contaminated and causes diarrhea amongst mostly women and children as observed about 15 years ago; the cattle herders migrate in search of grazing land;

4.3 SOCIO-ECONOMIC CONSEQUENCES OF CLIMATE CHANGE IN AUGIE

When the socio-economic impacts of the environmental problems stated by the participants in the Focus Group Discussion were compared, men were the income earners through livelihoods such as farming, fishing, hawking of water, trading etc. Occasionally the women participated in harvesting crops, but were mainly expected to cook and care for their families. As indicated in Table 4.4, during flood periods and the dry season, men embark on temporary migration to urban areas to do mostly menial jobs in order to earn some money for the family. Consequently, women are left alone (under the supervision of older members of the extended family) to take care of the household. During this period, some may choose to engage in petty trading to augment earnings from the men who had become temporary immigrants. In most cases, girls and young boys also get involved through street hawking of commonly required household items like tomatoes and pepper, pure water etc.

Table 4.4 Socio-economic consequences of climate change and environmental degradation

Environmental Problem	Environmental consequences on agriculture/food security, biodiversity, water resources	Socio-economic Consequences
Flooding	Washes away and submerges farmlands, crops and animals; contaminates water as during each flooding event, water takes about 40 days to recede	Increases cost of food stuff and fish; men embark on temporary migration for off-farm jobs and leave the women and the aged to care for the family; drinking water is affected causing diarrhea and cholera;
Erosion	Washes away top soils and causes damage to buildings and farmlands	Increases cost of available land; scarcity of land for farming; and grazing land;
Drought	Destroys crops and livestock; reduction of vegetation cover; causes water scarcity (quality and quantity) etc.	Increases cost of foodstuff and fish; leads to occasional purchase of water from Mai-ruwa (male water hawkers);
Desertification	Deposits sands on farmlands, accumulating as dunes; and kills animals.	Reduction in arable land for farming
Deforestation	Removal of trees, exposure of top soil to erosion by both wind and water; destruction of quality and quantity of biodiversity (e.g. Plants and animals);	Scarcity of fuel wood such that women have to purchase from neighbouring villages; or trek for longer distances into bushes risking life and increasing fatigue
Overgrazed land	Exposes top soil to erosion, degrades pasture land and destroys fertile farmlands.	Exposure of soils to further degradation, abandonment by farmers as the land becomes infertile, use of fertilizer makes farming expensive
Windstorm	Blows top soils away, uproots plants and destroys buildings	Increases incidences of cardio-respiratory illnesses due to wind laden fine dust particles as storms may last for hours
Heat wave	Dries up shallow water bodies	Exhaustion reduces hours spent on productive activities; increases cost of water

On health issues, both women men listed malaria, hypertension, HIV/AIDs, diarrhoea, asthma and diabetes as new ailments that were ushered in by the changing climate, with malaria being the most widespread. Thirty years ago, they relied on local herbs for treating illnesses such as chicken pox and yellow fever (which have literally vanished), but now have to go to the local hospital for treatment, especially because the herbs were no longer available. However, the hospitals do not have qualified medical personnel or drugs for treatment.

4.4 ADAPTATION (OR COPING) STRATEGIES BY WOMEN AND MEN IN AUGIE

The adjustment measures of adaptation strategies adopted are based on mostly individual efforts. Some of these have been ongoing for about twenty years; new technologies are gradually being adopted by the community. To cope with deforestation in Augie, the women sometimes resort to the use guinea

corn stalk or animal dung for cooking. According to them, these have culinary and health implications, but are the cheapest alternatives available to them. The smoke affects the aroma and taste of the food prepared and it requires that the fire has to be tended constantly. Like in Zumba community, they sometimes rely on younger females in the household for assistance. It is very rare to find a female fishing to earn a living, but sometimes they rear livestock for domestic use. As an alternative to pipe borne water, boreholes and wells are dug by the men. However, recently, the wells have to be dug deeper than in the past because the water table is currently very low. Regarding coping with the climate change in their farming activities, inorganic fertilisers, though still expensive, have become more accessible, water pumps are sold at subsidized rates for pumping out water from the fadama during dry season, irrigation is embarked upon etc. In addition, the farmers combine fishing and livestock rearing to augment their earnings. Furthermore, they employ the services of extension workers for advice on their agricultural activities. However, temporary migration to neighbouring states is another alternative as some of the able bodied fisher folks travel as far as Chad for employment as farmers or fishermen. Table 4.5 shows the coping strategies practised against the changing climate and environmental degradation in Augie.

4.5 CONSTRAINTS IN IMPLEMENTING ADAPTATION (COPING) STRATEGIES

Although, the participants had indicated that some of the coping strategies had lost their effectiveness over the years, they believe that with proper guidance alternatives can be found. Most of the options identified were more applicable to the men folk. The responses given are presented in Table 4.6. From the 16 adaptation measures listed, it appeared that the community was already practicing all but six of them. For example, water harvesting schemes were not being built because boreholes and wells were available. In addition, they had tried obtaining credit facilities but were not qualified, so applications were rejected. They informed the research persons that Kebbi State government provided some funds for the purchase of water pumping machines to encourage the use of irrigation facilities to increase production of crops such as rice, millet etc. This motivation by the government encouraged many farmers to purchase new pumping machines or maintain those provided by the government. However, as a result of the negative consequences experienced from the construction of Goronyo and Bakolori dams, the community representatives vowed never to allow the construction of such dams in their domain. Furthermore, the discussants complained of insufficient improved seedlings to purchase, even when they have been able to save up some of their earnings; and high cost of livestock feed.

Table 4.5 Gender-based adaptation or coping strategies adopted by Augie Community

COPING STRATEGIES	
WOMEN	MEN
In accessing energy: Use of millet or guinea corn stalk but requires that one tend the fire; or animal dung as alternative to fuel wood; or purchase from neighbouring villages	In accessing energy: Mostly taken care of by women and children take care of this in the homes
In accessing water: Access to drinking water is not a problem as wells are dug and boreholes exist	In accessing water: boreholes are provided by government but inadequate; digging wells though sometimes water table is low, so wells have to be deep;
On improving crop production: Men are more involved in cropping but women assist during the harvest period	On improving crop production: Planting early maturing varieties of crops; early cultivation; engage in off-farm jobs; migrate to neighbouring states to farm; access new technologies for pumping water on farms; embark on irrigation; use inorganic fertilizers; combine cropping with livestock production and fishing; employing soil conservation techniques (fallowing); consult extension workers for advice;
On enhancing livestock production: animals kept in the house, use drugs or dipping and sanitize environment to avoid disease	On enhancing livestock production: planting cowpeas and feeding the animals with the leave; purchase livestock feed and seek advice from extension workers.
On accessing fishery: Mostly involve the men	On accessing fishery: Use of smaller fishing mesh as the present day catch are smaller in size; migrate to fish in Chad and concentrate on farming

4.6 INTERVENTIONS FROM OTHER STAKEHOLDERS

In order to assess the extent of intervention from stakeholders in government, NGOs and CBOs as well as development partners, the research persons interviewed a few key stakeholders in Kebbi State. It was gathered that, previously, government's intervention on environmental issues was high at the state level, but this literally disappeared with the development partners (such as UNDP and World Bank) that initiated and implemented the programmes e.g. development of alternative energy sources such biodegradation of manure or animal dung. Also, tree planting (e.g. shelter beds) was an annual 'ritual' whose impact is barely felt in recent years due to the late release of funds for purchasing seedlings. However, at the policy level, the Ministry of Environment and Kebbi State Environmental Protection Agency have been created but these require both institutional and human capacity building and funding to effectively carry out their mandates. On climate change, no specific intervention programme is being

implemented. However, the focus on afforestation, if properly coordinated may contribute towards the mitigation of climate change in the long term.

Table 4.6 Constraints in Implementing Adaptation Strategies in Augie Community

Constraints in implementing adaptation strategies		
Constraints	Women	Men
(a) Lack of funds	Most of the strategies refer to activities or livelihoods of the men.	Migrating to urban areas
(b) Lack of information	Most of the strategies refer to activities or livelihoods of the men.	Purchase insurance
(c) Shortage of labour	Most of the strategies refer to activities or livelihoods of the men.	None (labour abundant but no employment)
(d) Others	Most of the strategies refer to activities or livelihoods of the men.	Boreholes are sunk or wells are dug; unnecessary to reduce livestock size; insufficient land to lease and inaccessibility to credit facilities as their applications were denied.

In Augie, the Local Government has been very active, providing solar powered health care facilities, constructing huge overhead tanks to provide portable water for the communities, providing training for the youths for alternative jobs, involving job-seeking youths in afforestation activities, providing tractors and subsidizing cost of purchasing fertilisers to help the farmers in improving crop production, etc. These were all efforts at enhancing the coping strategies of inhabitants of the local government area. Like Zumba, massive awareness campaign is required to encourage attitudinal changes and awareness creation on climate change. However, the LGA appears willing to uplift the people's lives through the activities listed earlier and with proper planning and coordination, intervention programmes targeted at climate change are more likely to yield positive results.

5.0 CONCLUSION

Recent projections on climate change have shown that global warming will continue in centuries ahead even if emissions of greenhouse gases (GHGs) and aerosol concentration stabilise by maintaining year 2000 levels (IPCC 2007a). Changes in global average surface air temperature (since 1850) in the twentieth century were observed to have reached 0.74°C with the warmest years being eleven of the last twelve years (i.e. 1995-2006). According to IPCC (2007a) report, additional global warming is projected to increase from 1.8 – 4.0°C in the twenty first century. This implies that predicted impacts of climate change mentioned earlier will intensify above previous expectations. The study is aimed at contributing gender-disaggregated data to mainstream gender into climate change discourse, policy, mitigation and adaptation strategies in Nigeria. Focus Group Discussions were used in gathering relevant information from the selected communities: Augie (Kebbi State) and Zumba (Niger State). Each participating individual was grouped according to gender and consisted of community leaders, religious leaders, representatives of various livelihoods, women leaders etc., who had resided within the communities for 20 – 40 years.

Previous studies have shown that compared to men, women disproportionately bear the burdens created by environmental degradation and a vicious cycle exists between this and climate change. It has become an accepted fact that environmental degradation has led to climate change which in turn exacerbates the existing degradation and that women, especially in developing countries, have contributed in no small measure by their usage of natural resources in their care giving role.

This study, therefore, is a step in the right direction towards ensuring that gender participation is not overlooked in Nigeria. From the study, it was observed that communities had actually noted the changes in prevailing climate but attributed this to various reasons, most of which had nothing to do with climate change. For example, despite observing the increase in temperature and reduction in length of rainy season due to late commencement of rainfall from March to May over the past four decades, the discussants in Zumba attributed the degradation of their environment primarily to the construction of Shiroro dam and the resulting massive deforestation that occurred. To the women of Augie, the most critical environmental problems affecting them are floods, deforestation and erosion. They, however, believe that the problems were caused by God and release of flood waters from Bakolori and Goronyo

dams. According to them, flood waters from Bakolori dam destroys farms and affects the health of members of the community. In addition, the women accepted that they had contributed greatly to deforestation by harvesting trees for fuel wood, but that the activity had led to the disappearance of many plant and animal species and not climate change. Although, the communities, based on individual efforts, have put various adaptation measures in place, they were not targeted at reducing the impact of climate change. Therefore, massive awareness campaign is required to encourage attitudinal changes and awareness creation on climate change. From results of the study conducted, Augie community is already practicing a number of coping strategies and have requested for assistance to strengthen them. Specifically, a request was made by all stakeholders that the key problems include funding, awareness creation and capacity building. On the other hand, more intensive but careful awareness creation is required in Zumba on the link between their traditional practices, environmental degradation and the changing climate whose impacts they have begun to experience.

REFERENCES

- Agarwal, B. "Conceptualizing Environmental Collective Action: Why Gender Matters." *Cambridge Journal of Economics*. Volume 24 No. 3 (2000): 283-310.
- Aguilar, L, Araujo, A. and Quesada Aguilar, A. Gender and Climate Change. 2007. Online. Internet. Genero y Ambiente Library. August 2009.
- Bradshaw, S. "Socio-Economic Impact of Natural Disasters: A Gender Analysis." UN ECLAC, Santiago, Chile, 2004.
- Braidotti, R., Charkiewicz, E., Housler, S., Wieringa, S. Women, The Environment And Sustainable Development. London: Zed, 1994.
- Canadian International Development Agency (n.d.). "Gender Equality and Climate Change: Why Consider Gender Equality When Taking Action on Climate Change?" Online. Internet. CIDA. August 2009.
- Cleaver, F. "Analysing Gender Roles In Community Natural Resources Management: Negotiations, Life Courses And Social Inclusions" IDS Bulletin Volume 31 No.2 (2000): 60-67.
- Christian Reformed Church. "Global Debt". An OSJHA Factsheet. Office of Social Justice and Hunger Action Group, 2005. Online. Internet. Christian Reformed Church Factsheet. August 2009.
- Dankelman, I., Alam, K., Bashir Ahmed, W., Diagne Gueye, Y., Fatema, N. and Mensah-Kutin, R. Gender, Climate Change and Human Security: Lessons from Bangladesh, Ghana and Senegal. WEDO, ABANTU for Development in Ghana, ActionAid Bangladesh and ENDA in Senegal, 2008.
- Davis, I. et al. "Tsunami, Gender, and Recovery: Special Issue for International Day for Disaster Risk Reduction, South Asia Disasters." 2005. Online. Internet. GDN Resources. August 2009.
- DFID/BRIDGE. Gender and Climate Change: Mapping the Linkages. A Scoping Study on Knowledge and Gaps. Brighton: Institute of Development Studies, 2008. Online. Internet. World Bank Resources. August 2009.
- ECOSOC. Annual Report. New York: United Nations, 1997.
- FAO. Community Based Adaptation in Action: A case study from Bangladesh. Environment and Natural Resources Management Series (14). FAO, 2008.
- IISD CRISTAL: Community-Based Risk Screening :Adaptation and Livelihoods. IISD, IUCN, SEI-US and Inter-Cooperation, 2007. Online. Internet. IISD Website. August 2009.
- IPCC. Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change, J. J. McCarthy, O.F. Canziani, N.A. Leary, D.J. Dokken and K.S. White, Eds. Cambridge: Cambridge University Press, 2001.

IPCC. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the IPCC Fourth Assessment Report. Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. And Miller, H.L. (Eds) New York and Cambridge: Cambridge University Press, 2007. Online. Internet. IPCC Website. August 2009.

IPCC. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the IPCC Fourth Assessment Report. Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J. and Hanson, C.E. (Eds). Cambridge: Cambridge University Press, 2007. Online. Internet. IPCC Website. August 2009.

Johnsson-Latham, Gerd. A Study on Gender Equality as a Pre-requisite for Sustainable Development. Stockholm: Environmental Advisory Council, 2007.

Lambrou, Yianna, and Grazia Piana. Energy and Gender Issues in Rural Sustainable Development. Rome: Food and Agriculture Organisation, 2006

Lambrou, Yianna, and Grazia Piana. Gender: The Missing Component of the Response to Climate Change. Rome: Food and Agriculture Organisation, 2006

Masika, R. (Ed.) Gender, Development, and Climate Change. Oxfam, 2002. Online. Website. Oxfam Online Publication. August 2009.

Neumayer, E. and Plümper, T. The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002. Online. Internet. Genero y Ambiente Library. August 2009.

Okhimamhe, A. A. “Current Vulnerabilities and Latest Adaptation Strategies: Nigerian Situation as it relates to ‘Women in Climate Change’ (First Lady Initiative)”. A Paper presented at the awareness workshop on the challenges of climate change adaptation and sustainable livelihood, organised by the Federal Ministry of Environment, Housing and Urban Development (FMEHUD) in collaboration with the Heinrich Böll Foundation on the 25-28, June 2008, Shukura Hotel, Sokoto.

Osman-Elasha, B. “Climate change impacts, adaptation and links to sustainable development in Africa”. International Journal of Forestry and Forest Industries: Vol 60(231/232). FAO, 2009.

Oxfam. The Tsunami’s Impact on Women. Briefing Note. Online. Internet. Genero y Ambiente Library. August 2009.

Peterson, K. “Reaching out to women when disaster strikes.” Soroptimist White Paper, 2007. Online. Website. August 2009.

Röhr, U., Alber, G., Skutsch, M., Rose, J. and Van der Heul R. Mainstreaming Gender into the Climate Change Regime, 2004. Online. Internet. Genero y Ambiente Library. August 2009.

Rosenbloom, S., and Burns, S. Gender Differences in Commuter Travel in Tucson: Implications for Travel Demand Management Programs, UCTC No. 273, Berkeley, 1993.

Soussain, J., Ian Burton, and Anne Hammil. Livelihoods and Climate Change: Combining Disaster Risk Reduction, Natural Resource Management and Climate Change Adaptation in a New Approach to the Reduction of Vulnerability and Poverty. Winnipeg: International Institute for Sustainable Development, 2003.

UNDP, UNEP, World Bank, ADB, AfDB, GTZ, DFID, OECD and EC. Poverty and Climate Change: Reducing the Vulnerability of the Poor Through Adaptation, 2003. Online. Internet. Europa EU. August 2009.

UNDP. Human Development Report 2005: International Cooperation at a Crossroads: Aid, Trade and Security in an Unequal World. New York: Palgrave Macmillan, 2005.

UNDP (2007). Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World. Online. Internet. UNDP Reports. August 2009.

UNDP. Resource Guide on Gender and Climate Change, 2009.

UNEP. Past, Present and Gender In Environmental Assessment And Early Warning (GEO-3). Nairobi: UNEP, 2005

UNEP. The Second African Environment Outlook: Our Environment, Our Wealth (AEO-2). Nairobi: UNEP, 2006.

UNEP. The Fourth Global Environment Outlook: Environment For Development (GEO-4). Nairobi: UNEP, 2007

Zeitlin, J. Statement at the Informal Thematic Debate: Climate Change as a Global Challenge, 2007. Online. Internet. WEDO Library. August 2009.

ACKNOWLEDGEMENT

The author would like to extend her gratitude to Heinrich Böll Foundation, Lagos for providing the funds for conducting the study. In addition, sincere appreciation is expressed to the following research assistants who worked tirelessly during the Focus Group Discussions: Saratu U. Ibrahim, Mairo Mohammed, Haruna U. Mohammed and Isaiah Sule.

**CLIMATE CHANGE, ITS IMPACTS AND ADAPTATION: GENDERED PERSPECTIVE
FROM SOUTH-EASTERN NIGERIA**

By Dr. Julia Agwu



(Photos by Dr. Julia Agwu)

1.0 INTRODUCTION

Climate change is a major human security issue. Globally, it poses threats such as gully erosion, increased frequency of extreme weather, flooding, storms, drought, desertification, rise in sea temperatures, heat and cold waves, the melting of glaciers and increased insect activity. These events have major ecological, social, economic and political effects; they lead to food shortages, water scarcity, the spread of infectious diseases, a lack of biomass fuel and dysfunctional hydropower, shelter insecurity, the impoverishment of communities, and the violation of basic human rights (Brody *et al.* 2008; Eleri 2007; ELIANMEP 2008; Rodo 2002; Zhou 2004).

Climatic change isn't just a technical subject. It makes the poor poorer and threatens progress and the achievement of the Millennium Development Goals (MDGs). From this perspective, climate change takes centre stage in the field of sustainable development.

Some countries are more vulnerable to the impact of climate change than others. According to the BNRCC (2008), Nigeria is particularly vulnerable because of its rain-fed agriculture, fishing activities, and high density of population (140 million people on an area of 923,000 sq km). In Nigeria, climate change threatens water resources, agriculture, land use, energy, biodiversity and health, primarily. The scourge of climate change has already been felt in several regions and the South-Eastern part of the country is no exception.

For many years, the impact of climatic change in the form of erosion, landslides and general land degradation has threatened lives and property in South-Eastern Nigeria. People have been forced to desert their ancestral homes and become refugees. Fertile lands have been lost; leading to less food production and an increase in the number of people living below the poverty line (Ogbozor 2002, Olori 2006). So far, the environment degradation has mostly been caused by human activities rather than abrupt climatic changes. Activities such as deforestation, the burning of fossil fuel, indiscriminate excavations of soil for foundation filling and sand for brick making, plastering and mining has exacerbated the impact of climate change in South-Eastern Nigeria (Reich *et al.* 2001; Olori 2006; Onwerenmadu 2007).

For the most part, the Government has failed to establish an institutional and legal framework or systematic approaches and policies targeted at combating, mitigating, and adapting to the impacts of climate change. However, preliminary steps have been taken by publishing a First National Communication on Climate Change, as part of the country's obligations to the United Nations Framework Convention on Climate Change, by setting up a national focal point on climatic change and creating a unit to facilitate Nigeria's participation in the budding carbon market. Climate change may not yet be seen as a priority but it is now on the Nigerian agenda. However, like the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto protocols, the gender perspective remains absent.

The gender perspective is important because climate change affects men and women differently. The distribution of gender roles and the importance of gender inequalities are such that women are more vulnerable to the impact of climate change than their male counterparts. Data on sex-differentiated impacts of climate change, with emphasis on capacity to assimilate adaptation and mitigation measures in local communities will provide the gender desegregated data needed to bring gender on the climate change agenda both locally and internationally. These data would hopefully illustrate the need for developing and applying gender-sensitive criteria in climate change policies.

The study was carried out in the South-Eastern states of Anambra and Enugu. In each state, a rural community that had been devastated by impacts of climate change was studied.

In both study sites, rainforest trees such as *Khaya ivorensis*, *Newbouldia laevis* (ogilisi), *Pterocarpus soy-
auxii* (Ora), *Dacryodes edulis* (ube igbo), *Irvingia gabonensis* (ogbono), *Irvinigia wombolu* (ugili),
Vernonia amygdalena (onugbu), *Ricinus communis* (castor oil plant), *Parkia biglobosa* (osisi okpei),
Spondias mombin, *Ceiba pentrandra*, *Bombax buonopozense*, *Pentaclethra macrophylla* (oil bean tree),
Treulia africana (African breadfruit), *Acioa barteri*, and shrubs such as *Jatropha curcas* are found.

2.1.1. ENUGWU NANKA

Enugwu Nanka is a community of farmers and petty traders. Coal mining and exploration exposed the vast agricultural lands to erosion and other agents of denudation. Made up of seven villages, this community has been the hardest hit, in the region, by environmental degradation in the form of erosion gullies and landslides.

2.1.2 AKAMA AMANKWO

Akama Amankwo is a community where coal mining and exploration has exposed the vast agricultural lands to erosion and other agents of denudation with devastating consequences. In May 27, 2008, no fewer than 200 families were rendered homeless following the destruction of homes and economic trees worth millions of dollars by a tornado and heavy downpour.

2.2. SURVEY METHODS AND INTERVIEWS

Information was gathered through qualitative and participatory research methods in the course of the study conducted from July 20 to August 11, 2009. The target population was made up 200 respondents (100 men and 100 women) from Enugwu Nanka and 100 (50 men and 50 women) from Akama Amankwo. In total, 300 respondents were sampled.

2.2.1 RESEARCH QUESTIONS TO THE TARGET COMMUNITIES

- What impacts of climate change are prevalent in the communities?
- Can the inhabitants identify the causes of climate change and the control measures?
- What are the stereotyped social and economic roles that are inimical to the survival of the affected women?
- What social inequalities are prevalent in the communities, and what are their effects on the female inhabitants?
- What are the socio-economic consequences of the impact of climate change on the women?
- What was the assistance rendered to the affected women by the community, the government or any other organisation?

Interactive Sessions focused on:

- Human activities and climate change
- Indigenous adaptive and mitigation processes
- The need for alternative measures for coping with soil erosion and poverty such as micro-entrepreneurship
- The role of women in poverty and environmental degradation
- The need for education

- The occurrence and control of diseases and nutritional disorders in erosion devastated communities.

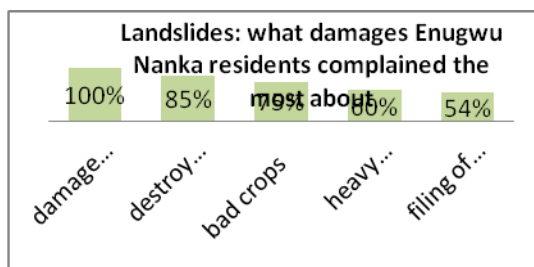
2.2.2. RESEARCH QUESTIONS TO COMMUNITY LEADERS AND LOCAL AND STATE POLICY MAKERS

- What are the impacts of climate change on the inhabitants?
- What knowledge of the differential effects of the impacts of climate change on men and women does the administration have?
- What is the ability of the community to handle the impacts of climate change?
- Are the community's rescue and adaptive measures gender responsive?

3.0 PRIMARY ENVIRONMENTAL CONCERNS OF THE INHABITANTS OF ENUGWU NANKA AND AKAMA AMANKWO REVEALED BY THE SURVEY.

3.1. LANDSLIDES

Landslides are the major impacts of climate change in Enugwu Nanka, while they are absent in Akama Amankwo. The landslides destroyed arable lands and crops, shelter (both animal and human), roads and filled streams with sand, making them inaccessible. It is a common knowledge that houses are consumed by landslides on a weekly basis in Enugwu Nanka. During my stay in the village, a house was destroyed by landslides claiming both human and animal lives; a few days before my arrival, another house had been consumed by landslides. Many houses close to the erosion gully and landslides vicinity have been abandoned for fear of being consumed by the landslides as well. The havoc being caused by landslides in Enugwu Nanka has also been reported by many authors (Ukpaka 2006; Olori 2006). The authors mention that lives were lost during the period of study and that there was a general impoverishment of the community which led to hunger. The difficult situation of Enugwu Nanka inhabitants is exacerbated by the fact that the community is mainly made up of farmers who have to lease land in other villages. When they are ready to transport the goods back to their communities to sell, they are confronted with the poor state of the roads. Their farm products become difficult to transport and these perishable goods sometimes end up wasting. Invariably, profits are reduced or lost.



3.2. TORNADOES

Akama Amankwo has the specific problem of tornadoes as the major impact of climate change in the environment. Tornadoes destroy property, render affected inhabitants homeless and claim lives. After the natural disaster of May 27, 2008, many Akama Amankwo inhabitants became refugees in neighboring communities. Livestock, economic trees and electric poles were also destroyed by tornadoes during this period. Thus also depriving the inhabitants of their means of livelihood, and throwing them into total darkness

3.3. EROSION

Erosion affects both the inhabitants of Enugwu Nanka and Akama Amankwo whose farmlands are devastated. Heavy and destructive rainfall—another impact of climate change—play an important role in erosion by carrying away the soil damaged by the agents of environmental denudation, thus destroying farmlands, crops and habitation. When the flood water from eroded farmlands flows into streams, the water quality is affected. In both communities, the remaining arable land would definitely lack nutrients from the leaching of nutrients from the soil. As a result the agricultural crops grown there would lack these minerals and the resultant effect when consumed would be the deficiency of these nutrients in the inhabitants (Onwerenmadu, 2007). One of these nutrients, iodine has been reported to cause goiter when deficient. Goiter in pregnant women often result to bearing children who are small for their age, deaf or deaf mute, and mentally retarded (UNICEF, 1984). The women in these communities Nanka and Akama, would require iodine supplements to curb the effects of climatic change.

3.4. WATER SCARCITY

In both communities, water scarcity is a major concern. Respondents reported deteriorating water quality in streams because of frequent and severe flooding. To a lesser extent, the drying up of streams through excessive heat contributes to the water scarcity like and a significant deterioration of the water quality. . In Enugwu Nanka, landslides filled the streams with sand and their access has been obstructed by landslides. Corollaries of water scarcity—one of which is “water husbandry”— (i.e. storing water in containers for future use, in anticipation of scarcity) provide breeding sites for mosquitoes. Infectious diseases such as malaria, typhoid, cholera, dysentery, are on the increase. Drying up of streams is a strong indicator that infectious diseases are likely to spread.

Through the loss of their farmland, the inhabitants of the communities lost their primary, if not only, source of income. This leads to the emigration of young men, away from their ancestral land. During the survey in Enugwu Nanka, there were no men between 31 and 50 years old. Conversely women of these ages were adequately represented. The mass movement out of an environment deteriorated by the impacts of climate change is the popular gender response among the men of Enugwu Nanka while the women stay back to salvage the situation. In explaining this phenomenon, CIDA (2002) reported that male emigration happens as a result of shortage of resources, generating increased workload for women.

Table 1: Identification of the impacts of climatic change in Enugwu Nanka, and Amankwo Ngwo (in parentheses)

Environmental hazards(impact of climatic change)	No of respondents	Positive responses			
		Localities			
		Enugwu Nanka		Akama Amankwo Ngwo	
		+ responses	% + responses	+ responses	% + responses
Erosion destroying farmlands and crops	200 (100)	150	75	40	40
Land slides claiming arable farmlands and crops	200 (100)	170	85	0	0
Land slides destroying shelter (both animal and human)	200 (100)	200	100	0	0
Land slides destroying accessible roads.	200 (100)	200	100	0	0
Land slides filling streams with sand making them inaccessible	200 (100)	107	53.5	0	0
Tornado destroyed houses , uprooted economic trees and electric poles .	200 (100)	0	0	100	100
Loss of live stock to erosion	200 (100)	5	2.5	0	0
Loss of livestock to Tornado and storms.	200 (100)	0	0	90	90
Excessive heat	200 (100)	40	20	20	20
Increased activities of insect vectors of communicable diseases.	200 (100)	10	5	10	10
Heavy and destructive rainfall with long intervals of drought.	200 (100)	120	60	84	84
Drying up of streams	200 (100)	80	40	8	8
Deterioration of water quality in streams from increasing frequency and intensity of flood.	200 (100)	80	40	40	40

3.5 GENERAL AWARENESS ABOUT THE CAUSES OF CLIMATIC CHANGE

3.5.1. ENUGWU NANKA

A bit more than half of the Enugwu Nanka respondents reported that environmental problems had always plagued their community. They did not make a link to recent trends in climate change. Interestingly, the majority of these responses came from men and women aged between 21 and 40 years old who might not have been old enough to notice a tangible difference. On the other hand, about 80% of the respondents observed that the environment was changing and everybody agreed that the change was negative. Only about 40% of the respondents agreed that human activities were also responsible for the environmental degradation in Enugu Nanka

3.5.2. AKAMA AMANKWO

In Akama Amankwo, respondents were more aware of the recent changes as only 2% reported that the environmental problems have always been in their community. Not only were they aware of recent changes but they also agreed that community's environment was degrading (80%). They also acknowledged that human activity had worsened climate change impacts.

3.5.3. MALE VERSUS FEMALE AWARENESS

In Enugwu Nanka and Akama Amankwo, the females aged 41 to 50 years were the most knowledgeable of a change in the climate while men ages 31 to 40 years were the least knowledgeable.

It is evident from the data that the inhabitants of Enugwu Nanka and Akama Amankwo are aware of a change in the climate. They also agree that climate change is at the root of the environmental hazards which strike their communities. However, their failure to link climate change to human activities shows that they do not have enough information on climatic change.

Findings revealed that though the inhabitants of Enugwu Nanka were more knowledgeable of the causes of climatic change than the respondents from Akama Amankwo, they would benefit from in-depth environmental knowledge about how human activities exacerbate environmental hazards. Specifically, it would be beneficial to know the role of smoke from firewood which facilitates erosion by loosening the surface soil when it rains and trees serving as carbon sinks.

Deprivation of carbon sinks is a serious problem in these localities, as the women in Enugwu Nanka and Akama Amankwo use firewood to cook. Shrubs are cut down for wood, carbon dioxide is released into the air, and the zealous felling of trees deprives the community of carbon sinks. In Enugwu Nanka, the destruction of the lands and vegetation by landslides has worsened the fuel wood crisis and the women have resorted to cutting down bamboo trees and *Gmelina aborea* trees planted by the community to check the menace of landslides, in spite of a law with its attendant penalty, promulgated against this action. The inhalation of firewood smoke may also cause respiratory track disease among the inhabitants.

4.0 GENDER INEQUALITY

The inhabitants of the South-Eastern States of Nigeria are Igbos. Just like the other ethnic groups in Nigeria, Igbos are known for preserving their cultural beliefs and values. However, in these patriarchal communities, cultural beliefs and values tend to favour the male gender and women's rights are violated.

4.1. WOMEN DO NOT HAVE THE SAME RIGHTS AS MEN

Weak legal and policy instruments do little to curb gender inequalities and the violation of women's rights. The Nigerian legal and policy instrument encourages social inequalities against women (FRN Constitution, 1999). According to the Nigerian Constitution, only Nigerian men can transfer Nigerian citizenship to their spouses. The same constitution fails to protect young girls from early marriage. The Constitution notes that "any woman who is married shall be deemed to be of full age" (Section 29 4b). By doing so, it encourages early marriages with its underlying health hazards such as vesicovaginal fistula—one of the birth complications which was found to blame for the high mortality of teenage mothers in Bangladesh (UNICEF 1984). Early marriages place a tremendous amount of burden on the shoulders of young mothers. In Enugwu Nanka for instance, it is largely believed that girls ought to be married by the age of 18. As teenagers they are expected to take up the many roles of a mother which include providing for her children in the face of challenges as unforgiving as water scarcity and food shortages.

4.2 WOMEN HAVE LITTLE OR NO DECISION-MAKING POWER

Women don't have a say, in their own lives, talk less of decision-making power in their communities—decisions that may curb or exacerbate the impact of climate change. In most cases, a woman does not choose how many children she will have and ends up having more than she can take care of. In Enugwu Nanka and Akama Amankwo, the number of children a woman will have is often determined by the sex of the children she already has; women with more female children have more children than those with more boys. Maternal and child mortality in these communities are high due to the lack of finances to acquire medical services especially during pregnancy and childbirth.

4.3. WOMEN ARE DEPRIVED OF EDUCATION

The women of Enugwu Nanka and Akama Amankwo believe that educating daughters is important but do not have the funds to put them through school. In Enugwu Nanka, few children go to school because

women, who were not themselves privileged to go to school, are solely responsible for educating their children. In Akama Amankwo, educating children is a combined effort between the husband and the wife. Illiteracy is therefore chronic in the sampled localities. The findings by Nwakeze (2006) and UN/WEDO(2007) that women are generally prevented from developing to their full human potential and women's lower access to education encourages high illiteracy rates among them, buttress these findings.

4.4. WOMEN CANNOT OWN LAND

In these case studies, women cannot own land. As a result, they cannot take loans in the event of the erosion of the farmland from climatic change. And, without a loan, they cannot start a business to feed their children. Customary laws restricting women's property reduce their incentives to engage in environmentally sustainable farming practices and make long-term investments in land rehabilitation and soil quality less attractive to them.

5.0 WOMEN AND CLIMATE CHANGE

5.1. EDUCATING WOMEN

In the communities sampled, female respondents were more knowledgeable about climatic change because they depended on natural resources and, as a result, they were also more familiar with their natural environment. Women are responsible for half of the world's product and about 60% of the food produced in most developing nations (Aguilar et al. 2008). Women are not only the main stay of agricultural production; they are also responsible for post-harvest activities. Their specialized knowledge about natural resources makes them essential custodians of agricultural biodiversity. Women can therefore play powerful roles in influencing sustainable consumption decisions. It is on this premise that integration of women in environmental management process is advocated.

Still, the lack of formal education is a major roadblock. Many women in the communities studied are illiterate. There is a need for Adult Education Centres in both localities. In this study, education was confirmed to be the key factor determining the level of awareness of the respondents regarding climatic change; the educated respondents were more knowledgeable of the causes of erosion than the respondents without formal education. Egunyomi (2008) confirmed this observation when she recognised that education was the most potent tool human beings could use to conquer their environment.

5.2. HOW DOES CLIMATE CHANGE AFFECT WOMEN'S LIVES?

Climate change affects men and women differently due to the different social and economic roles they have been ascribed by society. Gender roles are activities ascribed to men and women on the basis of perceived gender differences. In most developing countries there is a pattern of men playing a main productive role and other subsidiary roles. Women, on the other hand, play three roles: a productive role, a reproductive (or domestic) role and a community management role. Women have to find a balance between these different responsibilities. Yet gender roles and the stratification of society have denied women equal visibility, empowerment, access to resources, a voice in the community and the nation at large. Instead it has led to other forms of gender disparities which place them below the poverty line (Population briefs 1999; Masika 2002; Ezielo 1999; Bridge 2008). As a result, women are highly dependent on natural resources and ecosystem services to carry out their responsibilities, making them more vulnerable to the impacts of climate change (Aguilar et al. 2008; FAO 2003).

5.2.1. CLIMATE CHANGE AS IT AFFECTS WOMEN'S PRODUCTIVE ROLE

The data reveal that at Enugwu Nanka, more than half of the women were farmers and that out of the nine (9) paid employments, seven (7) buy and sell fresh fruit, poultry, vegetables, seasonal farm products, goats, weed other people's farms and run and work in restaurants, which means that they depend on natural resources. Any imbalance or degradation will be disastrous to the income of the women. All the women having to work on family farms irrespective of their paid employments indicate that a woman's income can never be accurately computed as most times she is paid in kind. In addition to the paid jobs the women also render unpaid services on family farms or vegetable gardens. This further reduces the economic status of women. To this end, the average monthly income of the women in the communities is quite low between N 3,395 (\$20) and N 5,920 (\$40)

Table 2: Paid employment and average monthly wage of women in Enugu Nanka and Akama Amankwo Ngwo

Enugu Nanka			Akama Amankwo		
Paid employment/Income in kind	Number	Monthly income	Paid employment/Income in kind	Number	Monthly income
Buying and selling fresh fruits	2	N4000	Sells gari and rice	4	N5000
Sells poultry once in a while	5	N3000	Sells opka (at 9 th mile corner)	14	N5000
Grows and Sells vegetables and any farm product that is in season.	70	N3000	Restaurant Attendant	3	N4000
Sells poultry and goat once in a while	4	N2000	Civil Servant (Clerk)	2	N20,000
Sells plastics, makes and sells beaded ornaments	1	N3000	Secondary school Teacher	4	N37000
Caterer	2	N10,000	Nursery School Teacher	3	N5000
Weeding other peoples farms	10	N4000	Keeps livestock and Sells them	20	N3000
Carrying sand, blocks or mixing cement in a construction site (Most times they travel as far as Ekwulobia)	25	N4000	Grows and sells vegetable and any farm product in season	36	N4000
Total	119	N404,000		86	N509,000
Average Income		N3,394.95			N5, 918.60

For the women of Enugwu Nanka, the destruction of farmlands and crops by landslides and erosion were the impact of climate change and responsible for food insecurity as almost all the women were left without food and loss of income by landslides and erosion respectively (Table 20). At Akama all the women were exposed to food insecurity and loss of income by the destruction of farmlands and economic trees by a tornado, while only 48% were exposed to food insufficiency by erosion. The women in both localities as a result of insufficient food for their children took up menial jobs such as weeding and working at construction sites. This increased their work burden. The women in both localities all testified that they had to choose who to feed when the food was insufficient, and most times went hungry and were often ill and malnourished

Table 3: Socio-economic consequences of the impact of climate change on food in Nanka and Akama

No of respondents	Impact of climate change	Impact on human security	Gender specific vulnerability	Enugwu Nanka	Akama Amankwo
100 (50)	Erosion destroying farmlands and crops	Lack of food and loss of income	Household food provision: Insufficient food for the children necessitated taking up menial jobs such as weeding, working at construction sites as laborers: increased work burden as more time and energy was needed for food; Selective feeding - hunger; illness from malnutrition; reduction of time spent on income generation- poverty.	89 (89%)	24 (48%)
100 (50)	Land slides claiming arable farmlands and crops			90 (90%)	0 (0%)
100 (50)	Destruction of farmlands by Tornado			-	50(100%)
100 (50)			Not strong enough as a result of child bearing and so suffered illness from mental and physical tress from the increased work burden .This also reduced income generation further and exposed us to abject poverty.	90(90%)	40 (80%)
100 (50)	Uprooting of economic trees by wind (Tornado)		This resulted in loss of income, which resulted to hunger, and withdrawing our children from school. Took up laborers jobs which increased our work burden		30(60%)

Table 4: Socio-economic consequences of the impact of climate change on water on the women in Nanka and Akama

No of respondents	Impact of climate change	Impact on human security	Gender specific vulnerability	Enugwu Nanka	Akama Amankwo
100 (50)	Land slides filling streams with sand making it inaccessible	Shortage of water, proliferation of water-borne , and insect-borne diseases	Provision of household water for drinking washing and bathing: more time and energy spent in search of water in neighboring community , more mosquitoes in the environment, frequent cases of typhoid fever; increased work burden; spend money intended for food and education on water	100 (100%)	-
100 (50)	Drying up of streams			70 (70%)	8 (16%)
100(50)	Deterioration of water quality of streams from increasing frequency and intensity of flood.			80 (80%)	40 (80%)
100(50)			molestation by indigenes of neighboring communities during conflict over water resources	40 (40%)	0%
100(50)			Children were sick from diseases especially typhoid and malaria- increase in care burden; spends money intended for family on medication-budget problem and resource scarcity.	40 (40%)	30(60%)

Table 5: Socio-economic consequences of the impact of climate change on source of firewood on the women in Nanka and Akama

No of respondents	Impact of climate change	Impact on human security	Gender specific vulnerability	Enugwu Nanka	Akama Amankwo
100(50)	Landslide destroying vegetation.	Shortage of fuel-wood	Lack of wood for cooking necessitates traveling long distances to other communities for firewood- more energy and time intended for income generation is spent on firewood fetching. This increases the work burden as more menial jobs are taken to generate the required income	90	-
100 (50)			Conflicts over firewood fetching results to physical abuse and seizing of implements (machetes).	70	-

Table 6: Socio-economic consequences of the impact of climate change on shelter on the women in Nanka and Akama

No of respondents	Impact of climate change	Impact on human security	Gender specific vulnerability	Enugwu Nanka	Akama Amankwo
100 (50)	Land slides destroying shelter (both animal and human) / Tornado destroying shelter and uprooting economic trees	Loss of adequate shelter	Exposure to harsh environmental conditions and overcrowding led to health problems among the children (measles, dysentery, pneumonia),; This increased the time needed to care for the children – increased care burden.	70	35(70%)
100(50)			Loss of adequate shelter resulted to overcrowding and improper hygiene at the refugee camp, resulted to reproductive health problems.	40	-
100(50)			Reproductive Health problems at the refugee camp manifesting as vaginal bleeding, recurring in women whose babies were under three months old from mental and physical stress and infections	20	-
100(50)			Refuge in neighboring communities with extended family members- this resulted to household conflicts over food, water and firewood among the women in the household.	10	40(80%)
100(50)			Stored food items for sale such as gari, rice beans and Opka were destroyed by the storm. This halted that source of income and loans were taken from sympathizers to begin afresh – indebtedness.	-	18(36%)
			Reduced income from sales of livestock and fruits from the economic trees.- increased work burden.	20	30 (60%)

5.2.2. CLIMATE CHANGE AS IT AFFECTS WOMEN'S REPRODUCTIVE ROLE

The reproductive role of women includes child bearing, child and husband care, education of the child, cooking food, washing clothes, providing water for the family, and growing food for the family.

Data from the study show that the impacts of climate change on women in both localities are food insecurity, shortage of water, shortage of cooking fuel, shortage and loss of shelter, loss of income, increased burden of work and care giving, hunger and malnutrition, sexual and physical abuse, neglect of reproductive health, stress-related illness, illiteracy, poverty and early marriages.

Faced with the impacts of climatic change such as environmental degradation, women still have to play their reproductive role in a badly degraded environment, plagued by landslides, gully erosions and tornadoes.

These women provide food for their households even when they have lost their farmlands to landslides, their crops to erosion, and their economic trees to tornadoes. They deny themselves food to provide for their children. They become physically weak and in turn, they generate less income and become trapped in a vicious cycle of poverty.

In providing water for cooking, washing, bathing and drinking, at a time when streams have dried up, the water quality in streams has deteriorated, and the streams are not accessible due to landslides, more time and energy is spent in search of water in neighbouring communities. Money intended for food is spent on water, which means that they have to take on an extra job and increase their workload. Time for education is spent searching for water. Bad water and water husbandry bring typhoid and malaria. Then money for food is spent on medication and at the end of the day, these mothers fall into debt. It is well documented in environment literature (Fisher, 2006) that women and girls generally assume primary responsibility for collecting water for cooking, drinking, washing and raising small livestock. Provision of water would reduce time spent in search of water and releasing time for education. In Morocco, a World Bank Rural Water Supply and Sanitation Project increased the number of girls who go to school.

Data also reveal that shortage of firewood for cooking due to destruction of vegetation by landslides resulted to travelling long distances to other communities for firewood.

In this study, loss of shelter led to overcrowding in refugee camps and caused health problems among the children such as measles, dysentery, and pneumonia. Reproductive health problems were also detected among the women such as infections and vaginal bleeding in new mothers,.

5.2.3. CLIMATE CHANGE AS IT AFFECTS WOMEN'S COMMUNITY MANAGEMENT ROLE

Women have so many responsibilities but so few rights. Gender Inequalities deny them of the support that they need to carry out their duties in building their communities. Gender inequalities are exacerbated in the aftermath of disasters. In times of difficulty such as these, violence towards women is not uncommon.

"As a result of the destruction of our land by landslides, we lack firewood in this village. Our people go to other communities to fetch firewood, and there have been conflicts over firewood fetching with Amaopkara, Okoh, Agulu, Isuofia, Igboukwu, Umunna. Yes, female children are mostly affected."

HRH Igwe Oformata of Enugwu Nanka



Mothering Against All Odds Ngozi Chidozie's Story

I come from a family of 13 children in Enugwu Nanka. A land slide carried my father's house and led to my mother's death. I had to leave school because my mother had been paying the fees. Now, erosion has carried my husband's house, and my husband.

I just put to bed. My children (2 years and 3 weeks old) and I live in an uncompleted house lent to us by to a Good Samaritan but my children got sick from inhaling dust; our floor is not cemented.

I spend a lot of time looking for firewood. There is a law against fetching firewood from the mbuze (gully erosion) but there is no alternative.

5.2.4. WOMEN AS VICTIMS

Ngozi Chidozie of Enugwu Nanka dropped out of school after the death of her mother during one of the landslides, while her brothers continued. Her townswoman, Cecilia Obinwa, quit farming to avoid being raped in the farm when landslides consumed their farmland and pushed them into renting farmlands from a neighboring community. These are only a couple of cases showing how gender inequalities are

exacerbated after environmental disasters. Women are victimised by the impact of climatic change instead of being seen as positive agents of change and contributors to livelihood adaptation strategies. When fetching water, farming or collecting firewood from the neighboring villages, women are sometimes molested by men who take advantage of the fact that the outsiders will not be able to identify them.



Cecilia Obinwa making ornaments from beads

Cecilia Obinwa of Enugu Nanka's testimony

"After landslides destroyed our home and farmlands, I took a farmland on lease in another community for farming, but after several reported cases of rape on the farms by the indigenous men since they knew that we did not know them and cannot identify them, I gave up farming, borrowed money from the my daughter's madam and started a small shop where I sell plastics. I also learnt how to make ornaments from beads."

5.2.5. WOMEN AS STRATEGISTS

If given the chance, women can become strategists who can adapt to their environment's challenges. During Hurricane Mitch in Guatemala and Honduras in 1998 (Schrader and Delang 2000), in Ghana, Senegal, Mali and Bangladesh among other places (Dankelman *et al.* 2008), women have proven that they are effective in mobilising their communities to prepare for disasters and respond to its consequences. Adaptive process among these women included animal and crop diversification to suit the prevailing environment, shelter reconstruction, dietary adaptation and anti-erosion ring construction. The mitigation processes included the use of energy-saving technology such as improved cooking stoves and biogas.

In Mali and Ghana, women started to cultivate *Jatropha curcas* in commercial quantities. This fast-growing shrub is a source of bio energy for cooking; its seeds are used to make soap and shea butter (UNDP 2009). *Jatropha curcas* reduces erosion, increases water retention and nitrifies water sources. In Nigeria, the latex from this plant is also used for dental inflammation treatment. This plant serves as a

good example of the ways in which women are using indigenous knowledge to mitigate the effects of climate change and adapt in their communities.

These women understood that they had to use their own resources to cope in hazardous situations and are a testament to the fact that the gender perspective is paramount in planning any mitigation and adaptive process.

6.0 RECOMMENDATIONS

The following recommendations were the fruit of a focus group session with women from the communities which participated in this study.



Focus Group Discussion

6.1. RAINWATER CATCHMENT SYSTEM

The women of Enugwu Nanka, on recognising the contribution of zinc roofing sheets to erosion as a result of the grooves on the sheet which increase the momentum of the runoff rain water, build wells and channel the runoff into them to reduce erosion and serve as a water reservoir for future use. This is based on collection of rainwater and gravity flow principles. A water reservoir of 42x48-foot surface and 12-foot height, with a slanting top having an opening of 6 sq inches is built out of cement. The top serves as a collector, and when the reservoir has reached its capacity, the water runs through a pipe and empties into two 8,000-gallon reservoirs. Two 700-gallon drums collect the overflow from each of the 8,000 gallon reservoirs and the overflow from the 700-gallon drums are channelled into catchment pits (Ogwugwu). For Akama Amankwo where there is piped water, the same can be done in places not connected to public water works.

6.2. USE OF DOMESTICATED RAINFOREST TREES TO COMMEMORATE THE BIRTH OF A CHILD

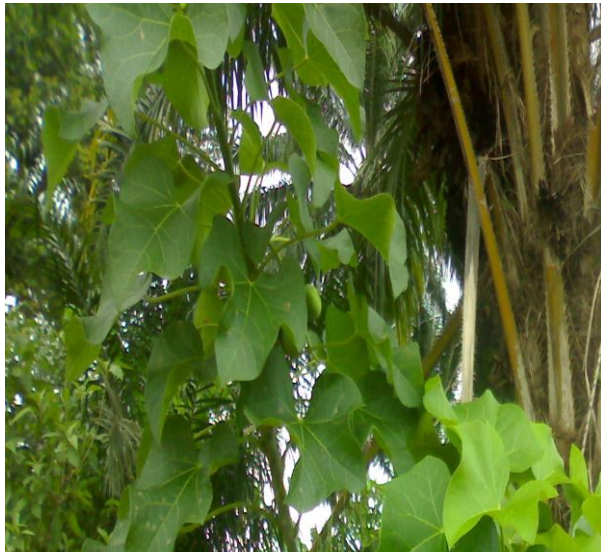
This indigenous concept which seems to be losing its importance will be re-emphasized, it will include planting a tree to commemorate the remembrance of a birth day, seal the celebrations on a wedding. Tree planting clubs will be formed by the women, youth and children.

6.3. CATCHMENT PITS (OGWUGWU)



Catchment pits (rainwater collectors) are dug along the flood path way. Some of the flood water is collected in them and when filled, the weak overflow moves meekly causing little or no erosion. This will soon be introduced in Akama Amankwo community.

6.4. FENCING FARMS WITH JATHROPHA CURCAS



Jathropha curcas, a hardy shrub which is not affected by poor soil or environmental conditions, and whose survival rate is high, utilized as a living fence in some parts of Nigeria, is planted round the farms, especially small farms as erosion breaks. This wonder shrub was introduced to the women of both communities during the interactive sessions as a good source of biofuel, with high medicinal value, useful in dye and wax production for industries, seed cake utilisation for soil fertility. This plant is a good income earner and serves as a carbon sink. The only

constraint here for the women will be the statutory and customary laws which restrict women's property and land rights and makes it difficult for them to access credit and agricultural extension services, reducing their incentives to engage in environmentally sustainable farming practices and make

long term investments. The people of Nanka plant bamboo and *Melina arborea* trees in the gully erosion site 'mbuze' to hold the soil and reduce the landslides to some extent. Provision of *Gmelina* seeds in large quantities will go a long way to ease some of the financial burden associated with gully erosion control, while adequate help is solicited globally to salvage the land.

6.5. EDUCATION

The level of illiteracy is very high among the women in both communities. The Adult Education Centres are too far from their communities. Most of them who enrolled were not regular because most times they could not afford the transport fare to the centre. It is necessary to establish an adult education centre in both communities with the collaboration of Adult Education Departments of the University of Nigeria, Nsukka, for Udi Communities, and of the Namdi Azikiwe University Awka, for Nanka Communities.

6.6. SKILLS ACQUISITION

The women have expressed an urgent need to acquire some skills since the lands are either not productive or have been consumed by landslides or erosion gullies. During the interactive sessions, the women indicated interest in learning how to weave textiles, make soap and pomade, bead and bake. In Enugwu Nanka, no one indicated interest in sewing and fashion designing. Akama Amankwo women were also interested in ceramics, hair dressing, sewing and knitting. Individuals who own businesses that can offer the required training for the acquisition of the skills will be engaged. Ceramics training will be done in collaboration with the Ceramics Unit of the Department of Fine Applied Arts in the University of Nigeria, Nsukka.

6.7. SHELTER



The women of Enugwu Nanka are in dire need of shelter. The refugee camp built by the government was abandoned, because it was in the middle of the forest and the indigenes were afraid of attacks by wild animals. The women complained that the refugee camp was too far from their source of water and they resented feeling like outsiders in their own community.

6.8. MICRO-ENTREPRENEURSHIP/ CO-OPERATIVES

Micro-credit will be given to the women for start and grow their businesses. This could be done through cooperatives.

6.9. FARMING

Agricultural extension workers should be employed to aid the women in boosting production of farm products. The procedures may include intercropping with soil cohesion crops such as pineapples to reduce erosion; mixing fertile and leached soil to increase fertility or planting.

Table 9: Adaptation measures from government institutions

Localities	Respondents	Questions and positives Responses			
		Have you been affected by impacts of climate change	Did the environmental problems affect your income?	What was the community /Government intervention during that period?	What do you want to do to stabilize your income
Enugwu Nanka	100	1000	Yes	A refugee camp was built for us though nobody lives there. Some household property such as beds with some food items were distributed to us (60:60%)	Loan to begin a business/learn a trade (:9090%) Shelter(60:60%) Adult education(70:70%)
				Nothing was given to us (40:40%)	
Akama Amankwo Ngwo	50	50	Yes	The local government gave some bundles of roofing sheet, and we got three sheets each, and a bag of cement. (30: 60%)	Loan to begin business (30:60%) Loan to repair shelter(24:48%) Learning a trade (30:60%) Adult education (80%)

7.0 Mainstreaming Gender into the Climate Change Discourse in Nigeria

Interviews with representatives of the ministries of Environment, Human Development and Resources, officials of the local government, traditional rulers and indigenes revealed that:

Climate change affects men and women differently;

Evidence of differentiated impacts is readily available from the people;

Interventions would be more gender-sensitive and universally effective, if affected communities, local and state governments would work closer together;

Interventions ought to respond to gynaecological problems and areas that affecting women primarily such as water, fuel wood, education and skill acquisition with microcredit opportunities for the women.

Policy makers exclude women and women organisation in discussions and decisions on climate change.

SEMA does not have disaster response policies, let alone a gender-responsive one.

A gender-responsive approach would arm the women adequately to face the challenges of the impacts of climate change.

This study showed that the States sampled do not have a policy on response to environmental disasters. They are ignorant of the differentiated effects of the impact of climate change on men and women though the Traditional Rulers and the affected indigenes can furnish them with this information. This has resulted to the negligence of the needs of women in planned interventions such as their reproductive health, need to reduce care and work burden in times of disasters, education, which most times is interrupted by the impacts of climate change. Sustainable developmental response is lacking in the intervention of the states. This is informed in their basing their intervention on periodic food supplies and not skills acquisition, education, which would give the women a little respite from the inconsistencies of income generation from the natural ecosystem. This would empower the women, giving them a little armour with which to face the challenges of the impacts of climate change. The abandonment of the refugee camp at Enugwu Nanka by those who lost their houses from the impacts of change, reiterates an already known fact that for any development to be sustainable, the beneficiaries must be part of the planning, implementation and monitoring process.

Simply put, the Government should not presuppose the needs of the people, but should ask them what they want and incorporate them in the planning and implementation.

REFERENCES

- Agarwal, B. "Participatory Exclusions, Community Forestry and Gender: An Analysis for South Asia and Conceptual Framework." World Development Volume 29 No. 10 (2002): 1623-1648.
- Aguilar, L., Araujo, A., and Quesadar-Aguilar, A. Gender and Climatic Change. IUCN (World Conservation Union), 2008.
- BRIDGE. Gender and climate change: A Scoping Study on Knowledge and Gaps. 2008.
- BNRCC. Building Nigeria's Responses to Climatic Change: A Backgrounder. 2008.
- Canadian International Development Agency. Gender Equality and Climatic Change: Why Consider Gender?, 2002.
- Constitution of the Federal Republic of Nigeria. Promulgation. Act 1999, Cap C23, Volume 3.
- Dankelman, I. Gender And Climate Change: Local Security In An Era Of Global Environmental Change. Nijmegen: Radboud University, 2008.
- Dankelman, I., Alam, K., Bashir Ahmed, W., Diagne Gueye, Y., Fatema, N. and Mensah-Kutin, R. Gender, Climate Change and Human Security: Lessons from Bangladesh, Ghana and Senegal. WEDO, ABANTU for Development in Ghana, ActionAid Bangladesh and ENDA in Senegal, 2008.
- Demetriades, J. and Esplen E. Gender and Climate Change: Mapping the Links. London: Institute of Development Studies, University of Sussex. 2008
- Eleri, E. O. "Strengthening Energy and Ecosystem Resilience in Nigeria." Sustainable Energy Watch, HELIO International, 2007.
- Ezeilo, J. N. Gender Politics and Law. Lagos: Women Aid Collective, 1999.
- Masika, R. Editorial. Gender Development and Change. Oxford: Gender and Development Journal, Volume 10, Issue 2. 2002.
- Nampingar, R. Why Consider Gender Perspective on Climate Change? Emerging Issues. United Nations. 2008.
- Ogbozor, N. Alternative Measures For Coping With Soil Erosion And Poverty In Udi Communities, South-Eastern Nigeria. 2002.
- Nwakeze, N. "The Demand for Children in Anambra State of Nigeria." African Populations Studies. Volume 22, No.2. (2007).

Olori, T. "Nigeria: Villages flee landslides." Inter Press, 2006.

Rodo, X., "ENSO and Cholera: A Nonstationary Link Related to Climate Change?" Proceedings of the National Academy of Sciences Volume 99 No.20 (2002): 1290-12906.

Upkaka, B. Umuchiana Gully Erosion: A long cry to relief. Impartial Observer, 2007.

United Nations Development Programme. Resource Guide on Gender and Climate Change, 2009.

UNICEF. Improving Maternal Health in Developing Countries. Washington. D.C: World Federation of Public Health Associations, 1984.

World Conservation Union. Climate Change Briefing. Gender and Climate Change: Women as Agents of Change. 2007

WEDO, Common Ground, Women's access to Natural Resources and the United Nations Millenium Development Goals, New York : WEDO, 2003 [http://www.wedo.org/files/common](http://www.wedo.org/files/common_ground.pdf) _ ground. PDF.

Whitehead, A. Rural Women and Food production in Sub-Saharan Africa . 1991 in J. Dreze and A. Sen. "The Political Economy Of Hunger" Volume 1, WIDER Studies in Development..Oxford Clarendon Press, 425- 473.

Yngstrom, I. Women, Wives and Land Rights in Africa: Situating Gender. 2002.

"Beyond the household in the Debate Over Land Policy And Changing Tenure Systems" Oxford Development Studies, Volume 30, 1.

Zohoi, G. Association Between Climate Variability And Malaria Epidemics. 2004.

"East African High Lands"Proceedings of the National Academy of Sciences Vol. 100 No. 8: 2375-2380.