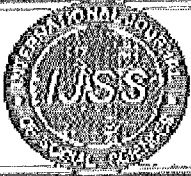


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## **CLIMATE CHANGE IMPACT ON LIVELIHOOD, VULNERABILITY AND COPING STRATEGIES AMONG FIKA PEOPLE OF YOBE STATE, NIGERIA**

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### **ABSTRACT**

*There is no doubt that climate change has become a major issue of global concern. Its impact is felt across varied sectors. In Sub-Saharan Africa this change impacts directly on peoples livelihood especially in the agricultural sector - the sector that sustains the rural population. The impact is understandably severe on the rural poor due to their low adaptive capacity. Relying on the experiences of people in Fika local government area of Yobe State, this paper examines the impact of climatic change on sources of livelihood in rural areas. It attempts to ascertain the level of vulnerability of people and assess their coping strategies. Data were sourced through household survey*

*informants and from published and unpublished works. Quantitative and qualitative data analytical tools were used. Findings show that erratic but extreme weather change particularly drought, rain delay, precipitation and heavy and un-seasonal rain are challenges to the livelihood of the study area. Further analysis shows that 63% of the household in Fika local government area are vulnerable to food insecurity. Poor households, women, children and very large families suffer the impact more than others. Lack of access to agricultural inputs, landlessness and water shortage further compound households state of vulnerability. The paper argues for comprehensive policy capable of addressing both short and long term needs of the people to cushion the impact of climatic change on people particularly the very poor.*

## **INTRODUCTION**

In recent times, there has been serious global concern and discussions on climate change across the world. These concerns are understandable in view of the wide ranging negative impacts it is having on countries and peoples. According to McCarthy (2001), it has created new sets of environmental and socio-economic challenges with severe social consequences. In Sub Saharan Africa - consisting of developing countries contending with widespread social problems including increasing poverty, high population growth, declining agricultural productivity and low technology to deal with the environment, the impact of climate change has been understandably severe. This is so because it impacts directly on agriculture which sustains the economy as it accounts for over 50% of most African countries GDP and over 80% of national employment (CIA - World Fact Book, 2008).

The situation in Nigeria is not different. It is a country with over 160 million people and a greater portion of the population is rural, depending on subsistent agriculture for livelihood. Most families especially in rural Nigeria are either cultivating crops, rearing livestock or doing both at the same time. Scholars like Deschenes and Greenstone (2006) believe that agriculture is the most susceptible sector to climate change. This is not

unconnected with the fact that climate change affects two important direct agricultural production inputs - precipitation and temperature. It indirectly influences emergence and distribution of crop pests and livestock diseases, exacerbates the frequency and distribution of adverse weather conditions, reduces water supplies and irrigation and enhances severity of soil erosion (Watson, 1998).

Interestingly, the impact of climate change is not uniform in all societies. According to McCarthy (2001); Tol (2000), European countries for instance benefit from gradual climate change due to the carbon effect and the warming climate. But in Africa - a continent that contributes less to climate change (Collier, 2008), the impact is adversely severe (Kurukulasuriya & Mendelsohn, 2007). It includes floods and droughts as well as shifts in marginal agricultural systems. To identify and assess the impact of climate change on socio-economic sectors and ecosystems, several studies have been undertaken at global level (Yarnel, 1998), however there are evidence that global policy decisions have faced continued political hindrances and more importantly, the traditional top down approach (global level study) has little local specificity and obviously have failed to address local impacts and local abilities to adapt to climate change impacts (Smith and Pillifosova, 2003).

According to Morton (2007), modelling or predicting climate change impact on predominantly subsistent farming households at international level is a very difficult task due to absence of standard definitions, difficulty to get benchmark data and farmers vulnerability to a range of stressors. Taking cognisance of the above facts, it does become pertinent to understand the dynamics of climate change impact at the lowest levels of the society such as households, communities and districts Deressa et al, 2008). The foregoing according to Ford and Smith (2004) no doubts enhances the relevancy of the top down policy approaches. Thus, this paper aims to ascertain the trend of climate change, its impact on livelihood, who is vulnerable to the impact and why; factors that worsens societal vulnerability as well as strategies adopted by victims to cope with the changes of climate.

To achieve the above aims, the researchers carry out empirical studies in Fika local government area of Yobe State. It relied on interviews with local stakeholders from Fika local government area to identify communities ability to cope with the future likely climate change impact. Though this study focuses on Fika local government area of Yobe State, its conclusions are relevant to other areas.

Nigeria's vulnerability to climate impact is a function of several factors that cut across physical, biological, social and economic factors. Over 90% of food supplies come from rain fed subsistent agriculture and rainfall failure means loss of major livelihood source and creates food deficit (Adogbign, 2006). The use of both irrigation and water harvesting technology has a long way to go to bring the desired development. This is largely due to the unsuitability of the topography for irrigation, uneven distribution of water resources and lack of technology. The sector is predominantly subsistent and characterised by poor farming practices that rely less on modern technology and farm practices.

A good proportion of farm land has been affected by widespread erosion, overgrazing, deforestation and loss of nutrients and consequently reduced per capita share of arable land (Adogbign, 2006). The population growth and resource degradation in the Northern part of the country has induced mobility towards the southern parts - the area that is frequently being affected by flood. With the foregoing realities, climate change is more likely to result in various cycles of poverty and resource degradation in Nigeria.

For many years, the growth rate of agriculture sector in Nigeria lags behind population growth rate. This obviously explains why Nigeria has to import agro products. For example, between 1980-1997, the population growth was hovering around 3% per annum while cereal crop production grew at the rate of 0.9% per annum. Indicating the declining food per capita, increasing food insecurity and worsening poverty (Bewket, 2003). Owing to the foregoing fact, and the high sensitivity of Nigerian agricultural

ecosystem to rainfall (Frazer 2007), and low adaptive capacity to respond to damages even a slight change in climate will have a large impact on the socio-economic activity of the country.

According to Hulme (2000), the average temperature rise in Africa is faster than the global average and is likely to persist in the future. As pointed out by Collier (2008), the warming is definitely hazardous for agricultural activities in the continent. He further posited that the warming of few degrees and increase in frequency of extreme weathers will consequently influence the agricultural production and negatively affect future adaptive capacities.

Robert Mendelsohn (cited in La Fleur et al, 2008) pointed out in his work that several attempts has been made to evaluate monetary impact of climate change in Africa. For example, it is estimated that African farmers on rain fed land will lose 28 dollars per hectare per year for each 1 degree global temperature rise. But the level of information and knowledge on climate impacts in several sectors of Nigeria is scanty. However, the study of the impact of climate change on the livelihoods of local population is seriously needed (Morton, 2007) and different approaches and methodologies are used for this purpose but before we proceed any further, it is necessary to define the three reoccurring concepts.

### **Impact**

According to Brooks (2003), the term impact has been variously used to denote hazard, risk biophysical vulnerability or general vulnerability. However, in this study, the term impact is used to refer to the extent of damage inflicted by climate change on livelihood and social systems. The impact of climate change on sources of livelihood is analyzed based on local climate data, impacts, vulnerability and coping strategies using qualitative study.

### **Vulnerability**

This is defined as the degree to which a system is susceptible and unable to cope with adverse effects of climate change including climate variability and extremes.

### **Coping strategies**

This refers to actual responses to crises on livelihood systems in the face of unwelcome situations. It includes both personal and institutional responses.

### **ANALYTICAL FRAMEWORK**

In this study, the current impact, vulnerability and coping strategies were assessed by collecting primary data from respondents (interviews and observations) and secondary data (temperature and precipitation trend and published and unpublished information). The data on climate change and livelihood and the society were also collected from the local people interviewed; government officials, local experts and secondary data from government offices and other literatures.

### **STUDY AREA**

The study was conducted in Fika local government area of Yobe State. It is located in the Southern part of Yobe State - one of the states in North-Eastern part of Nigeria that was created in 1991. Mixed farming and pastoralism are commonly practiced in the area. The area experiences short rainy season that starts around June and last till early September, extreme cold season that starts around early November till end of January and hot-dry season that starts around mid February till end of May. Temperature fluctuates extremely but averages between 16<sup>o</sup>C during cold season to 44<sup>o</sup>C during dry seasons. The amount of rain received in the area is low compared to what is obtainable in the southern part of the country. It is between 700 mm to 1200 mm. But it accounts for over 95% of crop production. Therefore rain is important in Fika and any disruption has serious implications on socio-economic activities of the society. Fika local government based on 2006 population census is inhabited by 189,544 persons. It is a rural area with a semi urban headquarters.

## **LIVELIHOOD STRATEGIES AND CLASSIFICATION**

Like most part of North Eastern Nigeria, mixed farming dominates the livelihood of the zone. Land is an important asset of households for production of crops and rearing of livestock. Livestock serves as a major source of manure, fuel and as savings especially during seasons of poor harvest. Bulls are the major ploughing engines. Horses and bulls are also used in transportation of goods and people. Due to the high complexity and strong inter linkage between crop production and livestock tending, it is difficult to consider the two livelihoods separately (Aune, 2006). The inter linkage are related to manure production, traction power, fodder production and income generation. This makes it impossible to change one component without affecting others (ibid).

The most commonly produced crops in the area include - millet, Guinea corn, maize, tomatoes and beans. Wealth classification criteria were not clearly set but as in other parts of northern Nigeria, livestock ownership and land holding are two most important criteria for ones wealth and status measurement in the society. The household size is also included in wealth classification. The larger the size the higher its position on ranking. However, agricultural production is predominantly subsistent and it is difficult to estimate the household yearly income.

## **DATA COLLECTION**

Primary data on impact, vulnerability and coping strategies were collected using household interviews from January to March 2011. The interview was conducted on 73 households in four village settlements. The respondents were purposively selected. The interview questions focus on a more comprehensive range of issues including socio-economic status (land size, livestock number, literacy, sex gender and age), climate change trends, climate change impact on livelihood and the society, coping strategies and vulnerability.

Forty five percent of the respondents did not attend any other school other 'Islamyya', 34% attend up to primary school, 11%



attended secondary school and 10% have attended one tertiary institution or the other. A total of 14 females were interviewed. The lower female number is mainly attributed to society's tradition and male dominance. Interview was face to face and a sound recorder was used to prevent information loss. However, the researchers encountered some problems. Most respondents were afraid that their comments would have political consequences but they were assured that the study was purely for academic purpose.

## **FINDINGS**

This section is divided into three subsections corresponding to the developed analytical framework. The first part shows the impact of climate change on livelihood and consequently on the society. The second part presents the vulnerability of different social groups and the local and institutional coping strategies and finally, the major constraints are presented based on data generated during the fieldwork.

## **TRENDS OF CLIMATE CHANGE IN FIKA LOCAL GOVERNMENT AREA**

Though the frequency and extent of felt impact of climate change varies, the frequently experienced climate shocks are prolonged drought and delay in the onset of rain, erratic low precipitation and heavy and unseasonable rainfalls. Most respondents point to delay in the onset of rain that occurred in 2005, 2007 and 2009 and drought of 2008 as perceived climate changes. They also identified exceptionally heavy rains of 2007 and 2008 and the overall increasing temperature as evidence of climate change in the area. Officials of Fadama project and state agricultural and national resources confirms the above but meteorological data does not exist to support the claims however, agricultural production is predominantly subsistent and it is difficult to estimate the household yearly income.

## **IMPACT OF CLIMATE CHANGE ON LIVELIHOOD AND THE SOCIETY**

Evidence gathered during fieldwork suggests that climate change has been frequently imposing challenges on their



livelihood and consequently affecting the societies socioeconomic activity. During delay in onset of rain land becomes dry and difficult to plough, forage deficit results in weakness of bulls and its mortality (engine of subsistent cultivation) and lack of precipitation hinders seed cultivation and germination of cultivated seed. Rain delay was found to have significant differences on the harvest and temperature increases deprive livestock households of livelihoods. It also creates shortages of forage for livestock. The shortage of forage and high temperature increases livestock mortality and vulnerability to diseases. Flooding and erosion degrades the quality of soil as it washes way the vital nutrients needed by plants for germination. On the effect of climate change, it creates food shortages, malnutrition, increased susceptibility to diseases and financial lack.

### **COPING STRATEGY**

On local coping strategies to climate change used in Fika local government area, 51% of respondents relied on savings and hoarding of farm produce, 12% used improved agricultural seedlings and breeds that can withstand weather fluctuations. While 14% took to trading in response to poor harvest to supplement income. 9% resort to taking credits. However, further investigation revealed that resorting to taking credit and aid hampered local capacity to cope with impacts of climate change. Governments also provide full/partial access to fertilizers.

Findings also show that the poor, women, children and the old were the most vulnerable. The poor were the worst set of victims due to the fact that they could not afford to save/hoard their produce and were in no good standing to secure credit needed to cushion the impact of climate change. Women due to the fact that male dominates the society, are not entitled to land. They could only lease or be assigned by the men. This exposes them to the effects of climate change especially the widows. It was also found that inability to afford/access agricultural inputs increases vulnerability.



## **RECOMMENDATIONS**

In view of the fact that climate change impacts seriously on peoples livelihood, it is recommended that serious efforts be made to address water shortage occasioned by drought and delayed onset of rain. This could be done by constructing dams. This will help in irrigation farming which will help in reducing the level of vulnerability of the poor victims of climate change as it would guarantee dry season farming.

Improving the distribution system of fertilizer and other agro inputs to enhance access of the poor (most vulnerable group) to such institutional assistance will also reduce their vulnerability.

It is also recommended that efforts be made to improve peoples access to land (especially the widows) as well as creating alternative employment. This will help in reducing the vulnerability level of people as well as enhance their capacity to cope with the impact of climate change.

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