

Climate Change, Transhumance and Food Security in Nigeria

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Abstract: The constant and never-ending change in the Ozone layer formation has implicated desertification as a result of changes in climatic conditions over time. Induced by natural and man-made factors, climate change variability brings about serious threats such as land degradation, poor crop yields and conservations; and desertification for pastoral activities. The lack and shrinkage on the availability of pasture and grazing zones for pastoralists have prompted their movement from arid areas in the northern hemisphere to the River Benue for sustenance.

However, it is against this established premise that the thrust of the paper seeks to appreciate the effects of climatic variability on the pastoral activities and its implication on food production in Nigeria. Methodologically, the paper appropriated documentary method and data were ostensibly generated through secondary sources of data collection and analyzed in content. The theoretical framework of analysis for the study is anchored on the theory of Eco-violence as propounded by Thomas Homer-Dixon in 1998. The findings of the study had significantly revealed that the struggle for limited natural resources has aggravated conflicts, reduction of income accruable to farmers and low food production for human life sustenance. The paper recommends among others; enforcement of laws on carbon marketing, training of pastoralists in forage conservation techniques, introducing nanotechnology and breeding of livestock that adapt in harsh climatic conditions.

Keywords: Climate change, Livestock, Pastoralists, Security, Transhumance.

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I. INTRODUCTION

The intense seasonal migration of people from the Northern part of the country including herders and including herders and their cattle towards the savanna and southern part of the country in recent times has become a source of serious concern. This movement has caused a lot of environmental threat and near-state failure which has opened a vista to unleash mayhem upon the society. The mass movement of people of Northern extraction is largely due to changes and variability in weather conditions coupled with the need to provide forage for their animals. Such a southward movement has implicated arable farming and heightened the scarcity of food crops. It is important recalling that climate change and migration have become growing sources of concern for policymakers and scholars. These are problematized as a source of threats to security and securitization of the human population under the cloak of deadly conflicts between herdsmen and farmers in Nigeria. This predicament poses serious questions to the status of the Nigerian nation-state, as the human population is being severely scourged by deadly conflicts for which its prognosis and treatment have not received adequate attention.

Furthermore, Northern Nigeria constitutes over 82% of dry land, with livestock as the main source of income in the areas. Rainfall is scarce in the areas and means of survival of livestock have remained pasture. However, the inadequacy of graze land and pasture has left pastoralists with no other option than to seek where the cattle will graze to guarantee the health of animals. This has necessitated pastoral transhumance which is the traditional use of rangelands to maintain herds and households as they move from place to place. More serious than sparse rainfall is climate change which affects the ecosystem and supply of forage (Reid, 2008, Verstraete, Scholes and Smith 2009). The fall in mean annual precipitation and precipitation variability takes a toll on the condition of the rangeland, and fodder production as productivity in drylands is usually very low in seasons of substantial climate change.

Moreover, variability in rainfall has always led to unstable levels of water and water bodies as the implication remains that crop farmers expend more effort than normal, cultivating food crops in the region affected by climate change. On the other hand, pastoralists as well transhumanists migrate from rangeland to rangeland in search of food for their cattle, thereby moving down to the Southern part of Nigeria from the North during dry spells. It is important noting that unpredictable planting seasons and shifts in rainfall patterns, coupled with the destruction of farmlands lead to harvest failure which ultimately manifests in food shortage. This further leads to struggles for scarce resources needed for the survival of cattle between crop farmers and pastoralists. This study is organized into different parts of which introduction has been captured, the remaining sections are the literature review (livestock production and food security in Nigeria, implication of climate variability and reduction in national income), the theoretical framework, conclusion, and recommendations.

II. LITERATURE REVIEW

The review and appreciation of relevant extant literature will be organized under two themes as follows:

Livestock Production and Food Security in Nigeria

Transhumance is a traditional culture among communities that depend on ruminant and grazing animals for their survival. However, despite Nigeria's capitalist economy, pastoralism has remained an alternative and veritable means of livelihood and social exchange. The pastoral resources such as open rangelands, FADAMA lands watercourses, and rivers that used to sustain animals have dwindled as a result of changes and variability climatic conditions (Adamu, 2008). Over the years, inadequate supply of pasture and water, low quality of available pasture, drought, risks of contracting disease and risk of pests caused by climate change have greatly depreciated the level of production of dairy products and as such, reducing the nation's income from pastoral farming. According to the reports of IPCC (2007), desert encroachment currently moves at 600 meters per annum and 350,000 hectares per annum and has reduced the amount of land available for livestock production in the country. This has implicated the movement of herds and herdsmen to areas where pasture could be found in southern parts of the country. It is important to keep in mind that the uncontrolled movement of cattle -due in part to climatic change- to the southern part has been seen as a threat to food security.

Furthermore, Essien (2013) posits that food security is a situation of safe, adequate and nutritious food, physically and economically accessible to people, for sustenance and healthy and active life. It exists when a household sufficiently obtains food in adequate quantity and quality to support a meaningful life. The food meets the nutritional requirements of the household whether it produces or purchases the food (Essien, 2013). Accordingly, Essien (2013) averred that there are three crucial aspects of food security which include availability, sufficiency, and accessibility. These three are mutually inclusive. Hence, the absence of any aspect leads to food insecurity and less developed countries including sub-Saharan Africa countries, Nigeria not exempted has been found to have experienced food insecurity. Some factors affect small-scale farming, such as land degradation due to depletion and scarcity of natural resources. The result is a reduction in crop productivity with its consequences as it leads to violent conflicts amongst pastoral migrants and resident farmers in the areas, in a bid to utilize available but scarce natural resources, for each party's cause. Climate change exacerbates this struggle for natural resources, leading to herdsmen-farmers' riots in some parts of the country as seen in Benue state.

Implication of Climate Variability and Reduction in National Income

According to Obioha (2008), he noted that climate change has impacted negatively on the capacity of crop production of local people. This is further deepened by incessant occurrence of conflicts as a result of population pressure and scramble for resources. Excessive heat, dryness, and desertification in the northern Sahel of northern Nigeria have resulted in displacement of persons in an unplanned and chaotic manner, towards the southern axis of the Sahel. According to Barnett and Adger (2007) and Wisner et al (2007), they maintained that the issue of climate change has remained one of the world's greatest human developmental challenges. This is because of the continued reduction of biotic variables of the biomes. The conceived movement of the pastoralists has remained the need to feed their cattle with a balanced ratio. Herders' desire the best type of nutrition for their animals and lead them to the best available pastures throughout the year.

Furthermore, with climate change variability, the organization of the pastoral system has relied mainly on transhumance for reasons of scarcity and non-affordability of natural forage resources.

Poor annual rainfall may lead to livestock being frequently moved away for several weeks and months finding fodders and forages in more favourable rangeland. Despite the continued movement of the herders, climate change has grievously impacted negatively on the economic value of livestock production across the country. It has equally affected the amount of heat gained and lost by livestock, thereby increasing the losses in the livestock industry. As a result of the low productivity of livestock, Nigeria has lost over 76 billion naira

importing milk into the country (National Bureau of Statistics, 2009), proving that reliance on food importation is very dangerous for the economy of the nation. The non-availability of sufficient food and meat, coupled with climatic change have heightened the Nomadic movement, a system where risk management is volatile as herd destroy large quantities of food crops planted in the farms. Climate change in all has affected reasonable water level, stable rainfall pattern, regularity of precipitation seasons, balanced weather conditions which are essential factors for livestock sustenance, thus facilitating movement from the Northern part and beyond, southwards.

Theoretical Framework of Analysis

The theory applied in the study is centered on the theory of Eco-violence as propounded by Thomas Homer-Dixon in his book titled *Environment, Scarcity, and Violence* (1998). He drew his arguments from the relationship between environmental scarcity and outbreaks of violent conflict. He strongly focused on contextual factors which include the quantity and vulnerability of environmental resources, balance of political power, nature of the state, patterns of social interaction, and the structure of economic relations among social groups. These factors affect how resources will be used, the social impact of environmental scarcities, the grievances arising from these scarcities, and whether grievances will contribute to violence. The major assumptions of Eco-Violence Theory as propounded by Homer-Dixon include the following: -Environmental scarcities will have profound social consequences, contributing to insurrections, ethnic clashes, urban unrest and other forms of civil violence especially in the developing world (Homer-Dixon, 2009)

-The scarcity of renewable resources is the causal mechanism behind many conflicts (Schwartz, Deligiannis & Homer-Dixon, 2009).

-Environmental transformation alters the socio-political fabric of society, disrupting productive relationships and ultimately adversely affecting established constraints on and mechanisms of social peace (Homer-Dixon, 1998).

-Human ingenuity can reduce the likelihood of conflicts, particularly in countries with efficient markets, capable states, and an educated populace.

Bringing together international research project reports, Dixon refers to water shortages in China, population growth in sub-Saharan Africa and land distribution in Mexico to prove the following assumptions that supply-induced scarcity results from degradation and depletion of renewable resources and demand-induced scarcity results from population growth and structural scarcity is a result of unequal social distribution of land. He shows that these scarcities can lead to deepened poverty, large-scale migrations, sharpened social cleavages, and weakened institutions. This theory posits that conflicts in Chiapas, Mexico and ongoing turmoil in many African and Nigeria, for instance, are already partly a consequence of scarcity. Very importantly, amongst its arguments is that the violent consequence of scarcity should not be underestimated especially when about half the country's population depends directly on local renewable resources for their day-to-day well-being. Growing scarcities in subsequent decades will also severely affect a large number of people in a way that has not been experienced in the past.

Application of the theory

Fundamentally, the eco-violence theory poses resource scarcity as the product of insufficient supply, excess demand and unequal distribution of resources due to environmental hazards.

These sources of scarcity are spurred by population growth, economic development, pollution, and climate change. Economic resource scarcity in Northern Nigeria will disrupt agricultural productivity, livestock performance, and economic livelihood altogether, thereby inducing poverty and transhumance. As the theory posits, environmental quality determines migration to a large extent, which will occur if an area becomes inhabitable for the pastoral community, or there is the likelihood of much better performance in an area with more resources. Constraints in productivity and pastoral transhumance will further strengthen already existing religious, class, ethnic and linguistic segmentation as each group requires the limited available resources for daily survival, thus precipitating conflicts.

Fulani herdsmen are very compliant to migration and it is seen as a last resort to weathering risks associated with climate variability. Within the context of herder-farmer conflicts in Northern and

Southern parts of the country, the eco-violence theory will analytically capture, and explain the intricate nexus between climate change, food security, and conflict. This is because the four environmental resources (freshwater, cropland, forests, and fish) are resources that climate change affects. As a result of climatic variations, seas have dried up leading to a shortage of fish and freshwater. Drought and desertification have also led to the degradation of croplands and forests, shortening the resources that trigger herder-farmer conflicts in Nigeria. Herdsmen and pastoral communities migrate in search of arable land with higher food security and more favourable ecological conditions. It is in this process that they clash with farmers who would not permit any encroachment on their farmlands. The reason for this resistance to encroachment is that most of the impact of climate change is directly on agricultural productivity. Due to low yield from farmlands, farmers

cultivate more lands than they hitherto did, with only a little portion of land available for cattle to browse upon. The eco-violence theory, therefore, helps to explain the linkages between climate change and herdsman-farmers conflict.

III. METHODOLOGY

The upsurging need for adaptation of man to his environment has become a problematique as climatic change has caused more harm than good. However, man has devised strategies for existence and necessity-means of sustenance. This is implicated in the movement of the people, especially the herders and their cattle down the southern extraction of the country. The resultant effect, in the long run, is the problem of food insecurity. Methodologically, the paper utilized documentary method and data for the study were gathered through secondary sources and analyzed in content.

The secondary sources of data appropriated for the study include; official gazettes, books, journal articles, internet sources, newspapers, and monographs.

IV. FINDINGS

The continued shortage of food supply in Nigeria has become a national question that has to be addressed. This manifests on the large volume of food imported and incessant smuggling of goods, upon which the government has placed an embargo. On the other hand, the unpredictability of weather coupled with wrong weather forecast by different institutions responsible has heightened the threats of adverse effects of climatic change and mass Exodus of the pastoralists down the southern part of the country. In the course of the study, we discovered the following:

- That the struggle for scarce and limited natural resources in the form of pasture for feeding cattle has always aggravated conflicts between the pastoralists and indigenous farmers.
- That the conflicts that ensued between the farmers as a result of climatic change and its attendant variability has reduced incomes and taxes that accrue to the farmers and government respectively.
- That the above two factor-variables have caused low food production and insecurity for the sustenance of human life.

V. CONCLUSION AND RECOMMENDATIONS

The downward movement of pastoral farmers over the ages had been linked to the decline of pasture and rangelands, couple rapid development and provision of infrastructure that have blocked the cattle route leading to Sahel. It was noted in the study that the continuous migration of the herders to find pasture for their cattle had become a source of protracted conflicts, following the destruction of farmlands belonging to the indigenes. The implication of the conflicts that had always ensued between the two categories of farmers had led to a downturn in the economic gains and loss of lives especially, the productive labour force. Furthermore, the study revealed that climate change is not only a problem related to Northern Nigeria but its undesirable spillover effects are noticed in the southern part of Nigeria. The paper has also maintained that the existence of positive relationships between variations in mean annual precipitation and movement of pastoral communities had exposed direct links between land degradation and farmer-herder clashes in Nigeria. However, it is undeniable that several measures have been taken by transhumant pastoralists to improve livestock performance, but these have not adequately addressed the challenges at hand.

Then, it becomes meaningful to seek prognosis for the farmer-herder conflicts with the following recommendations:

- Teamwork amongst pastoralists to pool resources together for the production of pasture and water requirements of their herds helps strengthening pastoral communities.
- Grazing is essential for cattle, but individual owners of herds should make provision for purchasing empty hectares of land to practice grazing systems. They should not wait for the government to provide them with grazing land.
- The meteorological agency should always keep updated with the members of the public on the nature of weather and climatic conditions. This will help in strengthening strategies to cope with intending changes. Also, strict enforcement of laws on carbon marketing should be maintained always.
- There is the need to introduce the science of Nanotechnology as a veritable tool in Animal production and breeding of livestock that adapt in harsh climatic conditions.

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