CHAPTER ELEVEN

CONFLICTS, CHANGING CLIMATIC CONDITIONS AND FOOD SECURITY IN NIGERIA

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Abstract

Food is a universal human right with no known substitute. Thus, Woolf (2016) stated that "one cannot think clearly, reason well, love well, or sleep well until one has dined properly." This remark underscores the imperativeness of food to man; thus, the main objective of this study was to determine the effect of conflicts (insecurity) and changing climatic conditions on food security in Nigeria from 1999 to 2021. It based its theoretical stand on Sen's Poverty and Famine theory and utilized econometric techniques for its analysis. The study revealed that conflicts and climate change significantly impacted aggregate food production in Nigeria during the period examined. Thus, it was concluded that conflicts and climate change exerted significant negative influence on households' food security in Nigeria, hence given the above, the study recommends that; security agencies should endeavor to provide a peaceful environment for farmers; secondly, to stem the tide of rising sea levels across the major rivers in the country, the government should prioritize the dredging of Rivers Niger and Benue to reduce the effect of overflow which results to flooding that destroys food crops, particularly rice, during the rainy season. Finally, creating formal employment opportunities and income-generating activities for all qualified Nigerians can deescalate tensions (insecurity) across the country and give citizens access to nutritious food, thus securing their food.

Keywords: Conflicts; Climate Change; Food Production; Food Security;

Introduction

Humanity, faced with the dilemma of food insecurity from time immemorial, has continued striving to achieve food sufficiency for survival. Food security is viewed as a condition or state in which every person (households, state, and the nation) has unhindered and unobstructed physical, social, and economic access to enough, safe and nutritionally inclined food that guarantees their dietary requirements for an active, energetic and productive life. This implies that food insecurity refers to the absence or lack of access to enough, safe, and nutritionally-inclined food, which guarantees a household's nutritional needs for an active and healthy living (FAO, 2002; Barrett, 2002). Food security comprises four important components: food availability, food access, food utilization, and constant and sustained assurance of access to it. The United Nation's Food and Agricultural Organization (FAO, 2019) estimates revealed that 842 million people globally are still undernourished/malnourished, out of which an estimated 98 percent are said to be living in developing or third-world countries, with South Asia presently having the highest total figure of the undernourished, estimated at 295 million hungry persons. In contrast, the countries of Africa collectively have the biggest concentration of food insecure persons of any region.

Food insecurity affects more than 2 billion people worldwide, with 1.03 billion living in Asia, 675 million spread across the African continent, 205 million persons distributed across Latin American countries and the Caribbean, while 88 million of these hungry people are in Northern America and Europe, with 5.9 million in Oceania. Put succinctly, the vast majority of the world's hungry people are largely residents of poor countries, which as it were, accounts for 12.9 percent of the global population of the malnourished, who are daily in search and yearning for the true definition of food to be actualised in their lifetimes (FAO, IFAD, UNICEF, WFP and WHO (2020). A long-standing gap between food production exacerbates Nigeria's food insecurity challenge, rising population growth, and an unsustainable rise in food prices that has led to

the multiplicity of more hungry people (Babatunde, Omotesho and Sholotan, 2007). However, the country's food insecurity is linked to the numerous socio-economic and institutional constraints, including the effect of changing climatic conditions, perennial insecurity challenges (banditry, herdsmen-farmers conflicts, Boko-Haram terrorist acts, and widespread kidnapping) faced by both large-scale and small-scale agriculturalists who predominate Nigeria's agricultural sector (Nurudeen and Shaufique, 2019). While these conflicts collectively retard sustainable food production, households' food security is further hampered by the reality of climate change, as the frequency of its unpleasant consequences constitutes significant threats to both food security and the well-being of human lives across different regions of the world.

The adverse outcome of climate change has necessitated global concerns and efforts at mitigating its effects and advocacy for measures that would restrict human actions that induce climate change. Climate change refers to changes in the mean variability properties of the climate, which persists over an extended period, typically within decades or longer. The main cause of the climate change experienced in the present time is the human expansion of the greenhouse effect (IPCC, 2014). It is to be noted that government efforts at proffering solutions to the twin debacle of insecurity among farmers and farming communities on the one hand and the effect of climate change have yielded little effort, given that the crises have remained largely unresolved, further accentuating Nigeria's food insecurity. The resurgence of conflicts between farmers and farming communities has led to many farmers abandoning the all-important food production job, resulting in an inevitable incidence of food insecurity as food prices have continued to skyrocket amidst a growing population and an uncontrollable inflationary trend.

Furthermore, several studies have been carried out to investigate the relationship between national insecurity, climate change, and food security in Nigeria, with some believing that different socio-economic and political factors are responsible for the country's growing food insecurity.

For instance, Agbo (2012) claimed that man-made factors are climate change's fundamental driving forces or triggers. This is in line with Nzewi (2009), who previously stated that the current literature suggests that human activities such as altered land use, deforestation, wars, increased energy consumption, agricultural and industrial activities are responsible for approximately 60% of global warming. These human-climate-induced activities are triggers that accentuate the unending conflicts between pastoralists and farmers across the country, with food production being the major culprit. Nigeria's goal of becoming a food-secure nation has been severely hampered by the growing influence of changing climatic conditions, which has shifted the trajectory of food production throughout the country. As a result, households' expectations of safe, abundant, culturally acceptable, and nutritious food that meets their dietary and nutritional choices for an active and healthy life have been badly harmed (Essien, 2013).

Furthermore, the last two decades (1980s and 90s) were some of Nigeria's worst nightmares in meeting her food security aspirations, thus food insecurity has remained an intractable issue, putting several households and the future of many citizens at risk of starvation. Rainfall is required for the majority of food crops grown in Nigeria; while crops that need a lot of rain, for example, are produced along the coast and up to the Middle Belt region, food crops that do not require as much rain are grown in the country's northern regions. Moreover, excessive flooding across the nation's six geopolitical regions has adversely affected Nigeria's quest for sustainable food production, thus rendering many households food insecure. In addition, the unending conflict between herders and farmers, which has defied logic, is a consequence of global warming and climate change. The conflict has been spreading to Nigeria's Southern states due to a lack of grazing routes for cattle herders as a result of desert encroachment, which is a regular occurrence in northern Nigeria. Consequently, climate change is shrinking the space available for agricultural activities, as seen by the shrinkage of water formations (lakes), the drying up of grazing routes, and the loss of arable land to

desertification. The seasonal movement of herdsmen to the southern part of Nigeria during the dry season is therefore largely due to the effect of climate change-related shrinkage of Lake Chad and desertification in Northern Nigeria, with many of them now migrating southwards with the resultant effects being the prolonged conflicts involving herdsmen which affect aggregate food production (Adishi and Oluka, 2018; Onuoha and Ezirim, 2010).

Despite several food policies articulated by global food agencies such as the International Food Policy Research Institute (IFPRI), the International Institute for Tropical Agriculture (IITA), the International Fund for Agriculture Development (IFAD), and the International Institute for Sustainable Development (IISD), food insecurity has remained the norm in most developing countries. The effect of these policies and interventions has remained less effective, given that food insecurity in Nigeria has remained high despite billions of naira appropriated each year for agricultural production (Babatunde, Omotesho, and Sholotan, 2007). The underlining belief is that no matter the number of funds invested in the agricultural sector, the gains had remained slim in the face of the type of insecurity posed by the activities of non-state actors such as armed bandits, kidnappers, herders-farmers clashes, and other sundry crimes. Where these food policies are deemed effective, food insecurity has remained intractable as households quest to meet their food security aspirations equally comes in conflict with changing climatic conditions, which exert adverse effects on aggregate food production.

Several scholars in the past have argued that climate change precipitates food crises in parts of the world and serves as triggers for conflicts and other sundry vices in other climes due to resulting friction that arises from the struggle for control of limited agricultural resources between farmers and pastoralists. Some scholars view Nigeria as a place where the crisis associated with climate change is playing out without any significant measures in place to mitigate the effects. Consequently, the Food and Agricultural Organization (FAO) of the United Nations, in its various

reports titled “The State of Food Security and Nutrition in the World” showed that the underlying factors that induce food insecurity in the world are climate change, the country’s economic capability and conflict (FAO, IFAD, UNICEF, WFP and WHO, 2017, 2018, 2019). To this connection, Nigeria has been identified as a country where the FAO's three drivers play a significant role in aggravating food insecurity (Kralovec, 2020). Additionally, other researchers such as George, Adelaja, and Weatherspoon (2020), Ogbo, Ebele, and Ukpere (2013) and Ayinde, Muchie, and Olatunji (2011) posited that climate change is the key driver of conflict in several parts of Nigeria which has worsened the food security situation in the country and has reinforced poverty in some communities.

These socio-economic challenges, according to Sen (1981) hinder the attainment of households’ food security aspirations, the concomitant effect being a reduction in food production, accessibility, utilization, and stability of access, which culminates in the adoption of several food coping strategies, climaxing in food rationing, hunger and malnutrition and hence calorie deficiency among several households. Consequently, and in light of the foregoing, the most pressing economic policy option is to evolve ways to lessen the negative consequences of insecurity (conflicts) and climate change on food security; hence, to this connection, the problem of this research is to evaluate the nexus between conflicts (insecurity), changing climatic conditions and food security in Nigeria. Consequently, this study’s main objective is to assess the nexus between conflicts and climate change on food security in Nigeria, with specific objectives as follows: (i) to examine the extent to which insecurity (conflicts) had significantly affected food security in Nigeria (ii) to evaluate the extent to which climate change had significantly impacted food security in Nigeria.

The study examines the effect of conflicts and climate change on food security in Nigeria using quarterly data from 1999:Q1-2021:Q4. One important justification for adopting quarterly data is hinged on data availability and the fact that due to the frequency of occurrence of most

economic variables, they are better measured or estimated in quarters. Furthermore, the choice of 1999 coincides with the period when Nigeria, upon transiting from military rule to democracy, experienced several changes in the structure of the economy, leading to improved investment in the agricultural sector of the economy, as the return to democracy with less dictatorial tendencies signified investor's confidence in the economic potentialities of the country. It is further justified on the basis that the advent of democratic governance in Nigeria brought in its wake different agitations from non-state actors for resource control, and some of these have remained at the root of the unending cycle of violence on citizens across the federation, which has adversely undermined aggregate food production and hence food security in Nigeria.

Conceptual Clarification

Food Security

There are two ways to look at food and nutrition security: self-sufficiency and managing risk and vulnerability in food and nutrition supply. According to (IFPRI, 2004), for a long time, in the 1970s and 1980s, the term "food security" referred solely to a country's ability to produce enough food to feed its population. As nutrition security was added to food security in the 1990s and risk management and risk coping became more important in the 2000s, the concepts of food and nutrition security were blended with these other concepts. According to the World Food Summit Report (1996), food security is achieved when all people have continuous economic and physical access to appropriate, safe, and healthy food combinations that meet their nutritional requirements for an active and healthy lifestyle while maintaining their cultural traditions. Moreover, in 2001's The State of Food Insecurity, this concept was redefined to mean a situation in which all people have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and provides them with food options for leading an active and healthy lifestyle (FAO, 2002). Four fundamental pillars underpin food security: food availability, food access, food consumption, and food stability, which imply removing the potential that any shock may cause any of the first three dimensions or pillars to be disrupted in any way. While food availability

is required, it is not a sufficient condition for food accessibility, just as food accessibility alone cannot suffice without consumption.

Two variables mainly determine food security. These include guaranteeing enough food supply and, secondly, ensuring that households suffering from undernutrition or malnutrition have the opportunity to access food, either via self-production or by the ability to purchase it. As a result of the disagreements and divergent views expressed by various scholars regarding the definition of food security, this study adopts, as its working definition and hence views food security as a fundamental human right and the ability and/or capacity of all people, to have unfettered access to a sufficient, safe, and nutritious food combination that satisfies guarantees, and meets their food preferences and dietary needs for an active and productive life at all times, regardless of their financial means, as they could fall back on food aid.

Food Availability

According to Oni and Fashogbon (2013), food availability refers to the amount of food that households, communities, states, geopolitical areas, and nations have at any moment. It is primarily influenced and guided by domestically produced foods, imported foods, food aid/assistance, and other demand and supply elements in food production, as well as the underlying causes of each of these aspects (FAO, 1996). Food availability is defined as the availability of sufficient quantities of food to all persons within a given country regularly and consistently. According to this study, food availability refers to the accumulation or stock of food accessible in a given home, community, local government, state, or nation, which is attainable through domestic food production activities, food aid from donor organizations, or open importation from overseas. Food availability is sometimes confused with food access, as it can apply to household and aggregate food supply.

Although it should be noted that food availability is a poor indication of food security because it does not account for disparities in food access, the average daily calorie consumption per person does provide some insight into a country's overall food situation (Kidane, Maetz & Dardel, 2006). To ensure food availability for rural farmers in rural areas, it is necessary to

ensure they have access to sufficient food, whether through self-production or market purchases (given sufficient purchasing power). Cereals, roots, and tubers are Nigeria's diet's most important sources of calories. Nonetheless, due to a scarcity of suitable processing and storage facilities, most rural farmers in the country sell their excess produce during the harvest season and rely on food purchases during the rest of the year. Additionally, this study asserts that food availability in Nigeria is influenced by the following key elements or factors: agricultural inputs/machinery; the effect of climate change; the security of farmers and farming communities; government expenditure on agriculture; poverty, population growth, the level of food imports; the effect of poverty and governmental institutions in place – whether weak or strong.

Food Access

On the other hand, food accessibility refers to an individual's, household's, regional or nation's capacity or ability to access accessible food supplies at all times, given the income at their disposal. Access to food is mostly a demand-driven issue. Consumers' or households' access to food is contingent upon their available money and the cost of the foodstuff in question (FAO, 1996). These elements are influenced by the household's resource endowment, which specifies the range of productive activities available to achieve income and food security objectives (Kidane, Maetz & Dardel, 2006). Food accessibility is governed globally by four critical factors: economic, physical, political, and sociocultural influences.

Food Utilization

Food usage is a concept that refers to the quantity and quality of food that a household consumes to fulfill its nutritional and/or dietary requirements. A good dietary environment, also referred to as proper food use, connotes the presence of suitable and appropriate food processing and storage systems, acceptable and adequate knowledge of nutrition and child-rearing techniques, and access to suitable public health and sanitation services such as cleanliness and hygiene (FAO, 2000; Food and Nutrition Technical Assistance Project (FANTA), 2006). Food usage extends beyond the quantity consumed to the quality of food products consumed since quantity alone does not equate to well-nourished households. Malnutrition almost always results from underutilizing available and accessible dietary combinations. This can manifest as stunting, sickness,

or even obesity. However, this research study interprets food utilization differently. It adds that food use, as the end goal of the food production discourse, is the capacity of households to consume quality food of all categories or types required for their diet and healthy living. To ensure total food utilization, end users must have access to a variety of processing and storage methods for their food to maintain its shelf life and avoid contamination.

Food Access Stability

Food access stability connotes that households are not at risk of losing access to food due to unforeseen shocks induced by changes in weather conditions or other crises or cyclical occurrences such as seasonal food insecurity (Olarinde, Abass, Abdoulaye, Adepoju, Adio, Fanifosi & Wasiu, 2020). It is expected that causes of food insecurity will grow more frequent in the future, particularly as a result of climate change. This is due to escalating climate change and the impact of global warming, which has resulted in regular temporary food shortages and strains on existing resources, leading to political turmoil. Furthermore, the climate-induced migration of herders and their cattle throughout Nigeria for food and feed usually leads to violence. Conflicts over scarce resources such as water and land and migration due to drought may become more frequent and extreme due to climate change, increasing the risk of food poverty and malnutrition (Oni & Fashogbon, 2013).

Additionally, the FAO (2007) stated that irregular access to food caused by climatic change, political instability, or economic crises, such as unemployment, food inflation, and national insecurity, may have a disastrous effect on a household's food security status. However, this study contends that food stability or access stability refers to the continuous assurance that households, communities, states, and nations have that their food needs will always be met, regardless of external threats such as income loss (unemployment or underemployment), poverty, or political violence. Unfortunately, food security in Nigeria has become a problem for policymakers, given the present degree of insecurity in the country's key farming areas. This is in addition to the growing threats posed by unavoidable changes in climatic conditions as a result of global warming's devastating effects, which have resulted in unstable rains, flooding of agricultural products due to torrential rainfall, and a recurring incidence

of excessive heat waves, which are detrimental to the yield of a variety of agricultural products. These undesirable events wreak havoc on food production. It is important to remember that food security objectives can only be achieved when all four elements of food security are met concurrently.

Review of Related Literature

Insecurity: Political Violence, Terrorism and Food Security in Nigeria

Security is crucial to the social contract between citizens and the state; hence, protection of life and property is entrenched in the constitution as a fundamental right and entitlement of every citizen in Nigeria, regardless of the citizen's ethnic or religious affiliation. According to some scholars, insecurity is a breach of peace and security, whether religious, ethnic, regional, civic, social, economic, or political, that results in recurring wars and wanton destruction of lives and property, impeding genuine economic growth and food production. It results in a lack of protection and danger and presents hazardous conditions and a state of disorder (Etim, Duke, and Ogbinyi, 2017; Achumba, Ighomereho, Akpo-Robaro, 2013). It also refers to a lack of or an insufficient degree of safety against danger. It is a breach of peace capable of impairing an individual or country's lawful economic and social activities, caused by persons or groups of individuals whose predisposition is always and every time to see their nation or neighbors in pain. This unpatriotic voyage of inflicting either corporate or collateral pains on individuals or the state has the propensity to impede the implementation of government economic policies, including food production (Oladiran, 2014).

With Nigeria immersed in pervasive insecurity, it is safe to conclude that the country is a nation at war. This is despite defense receiving a colossal budgetary allocation each year. Traditionally, the threshold for a struggle to be classified as a civil war is 1,000 battle dead (Nwozor, 2019), a figure that Nigeria has continuously recorded even over 1,000 as a result of different violent conflicts around the country by various terror gangs against Nigerian's innocent and vulnerable population. Between 2010 and 2020, the Nigeria Security Tracker and the Armed Conflict Location and Event Data Project (ACLED) projected that between 55,261 and 88,530 persons died as a result of the Boko Haram terrorist group (Campbell & Harwood, 2018). These disputes and turbulence destroy every area of the

economy, with food production bearing the worst brunt of the carnage and damage.

In addition to the above, other violent deaths occur due to intra-community conflicts, herders-farmers conflicts, armed banditry, clashes between security agencies and socio-cultural and religious groups like the Independent Peoples of Biafra (IPOB), El-Zakzaky Shiite movement, and other criminal gangs, especially kidnappings for ransom. While the Boko Haram sect's deadly activities have grossly undermined food production, especially in the northeastern geopolitical zone of the country, another major danger to national security and food security is the threat of marauding herdsmen and armed bandits. Nigerian herders, who are mostly nomadic, always traverse the country in search of a better flocks pasture. Conflicts between nomadic herders from northern Nigeria and sedentary agrarian populations from the country's central and southern zones have risen dramatically in recent years, posing a danger to the nation's sovereignty. These battles, which have literally stagnated food production across the regions, are becoming as hazardous as the Boko Haram insurgency in the Northeast (International Crisis Group, 2017).

Since Nigeria's return to democracy in 1999, conflicts between cattle herders and farmers have become more frequent, persistent, and violent, with all conventional dispute resolution channels unable to contain them. The severity of the herders' violence caused the Institute for Economics and Peace to label them a "terrorist organization" and the fourth deadliest in 2014, with 1,229 deaths (IEP, 2015). This categorization was instructive and timely, given that the group was only responsible for 63 deaths in 2013 but scaled up its attacks, leading to approximately 1,229 deaths by 2014 estimates (Burton, 2016). Additionally, cattle rustling, crop damage, and water contamination are among the issues that herders moving into the savannah and rain forests of the central and southern states face. In the absence of mutually acceptable mediation channels, these disputes escalate. The violence in southern states is already straining regional, ethnic, and religious relations with debilitating effects on overall food production.

Given the presence of these herders in several West and Central African countries, any big clash with them in Nigeria could have regional

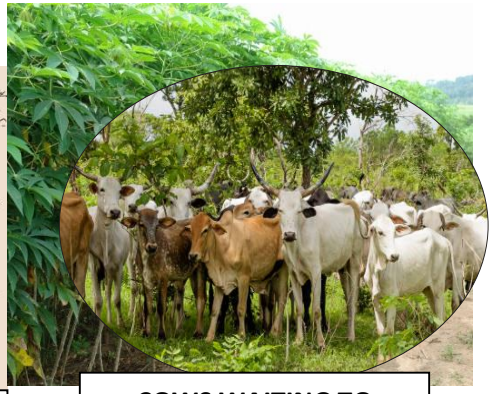
ramifications, as these herdsmen militias come from other nations in support of their kith and kin living in Nigeria. The ultimate victim in all these confrontations is food production; farmers who happen to be the major victims of these attacks migrate or run from their farming zones, thereby abandoning their farming activity in search of refuge wherever there is a guarantee of safety. The cumulative consequence of these conflicts is an interruption of food production, which has major ramifications for Nigeria's food security aspirations. While the North-west and North-central regions were hitherto immune to Boko Haram's frequent insurgent attacks in the past, they are now the hotbeds of armed banditry, with daily bloodletting from Katsina to Sokoto to Kebbi to Kaduna, Zamfara to Niger, Nasarawa to Plateau and Benue. Farming occupation has taken a back seat in these states, as farmers must pay ransom to bandits to cultivate their land and also pay ransom before harvesting. Anything else is akin to gambling with their lives, as they are unlikely to return alive to their destinations. For Zamfara, Kaduna, and Katsina States, which have recently become the epicentre of armed banditry, food production appeared to have taken a permanent back seat, as the nefarious and unpatriotic activities of these marauders and gangsters have kept farmers out of their farming occupation (International Institute of Tropical Agriculture) (IITA, 2019).

Figure 1: A simple illustration of the insecurity scenario in Nigeria:

SAMPLE OF NIGERIAN FARMERS

A typical Terrorist using a General Purpose Machine Gun to kill farmers

BANDITS/HERDSMEN/TERRORISTS/KIDNAPPERS ONBOARD HUNDRED OF MOTOR BIKES TO ATTACK THEIR TARGETS (mainly farmers)



COWS WAITING TO GRAZE ON A FARM

Corpses of some Rural Nigerian Farmers in Benue State who were slaughtered in their hundreds by Herdsmen Militias being taken for mass burial, around Makurdi, Benue State, North-Central, Nigeria

Unarmed and Helpless Nigerian Farmers laboring on their farms

It is distressing to note that the primary objective of most of these herders and other terror gangs is the coercive takeover and acquisition of ancestral farmlands from mostly indigenous peoples (particularly the farming communities of the North-Central Region), with a particular emphasis on key farming states like Nassarawa, Plateau, Niger, Kogi, and Benue State, which is also the nation's 'Food Basket State.' Their destructive tendencies and proclivity know no bounds, as they are also intent on acquiring enormous swaths of farmland in the North-West, North-East, North-Central, South-South, South-East, and South-West geopolitical zones for grazing and other yet-to-be-disclosed reasons. On this note, it is instructive to conclude that farmers' insecurity is directly linked to food insecurity, and food insecurity could trigger national insecurity, as a hungry man is often regarded as an angry man.

These assertions are variously supported by views expressed by scholars such as Campbell (2018), Adebisi, Azeez, and Oyeduji (2017), Adebayo (2013), kidnapping and criminal activities for Ukoji, Ayodokun, and Eze (2019), Nwagwu (2014), violent riots for Navarro (2017), Ojogho and Egware (2015), Fulani Herdsmen- farmers clashes for Fadare, Akerele, Mavrotas, and Ogunniyi (2019) have all found via historical rendition that each of these specific insecurity threats impacts food production and thus pose negative implications on food security. Hence, they articulated that conflicts (insecurity) play a negative role in every government's quest for sustainable food production and, thus, food security. Furthermore, Tanko (2021), Alhaji and Tsendzuul (2019), utilizing descriptive research to study farmers-herdsmen crises, revealed land as being the primary source of conflict between herders and farmers in Benue State, thus impeding sustainable food production. Similarly, Babagana, Madaki, Ibrahim, Adamu, and Gujja (2019), Ladan and Matawalli (2020) indicated that banditry activities significantly hindered farming activities in the Yobe and Katsina States. While. Ndubueze-Ogaraku, Etowa, Ekine, and Familus (2017) emphasized in their study that increased food costs were among the shocks individuals faced due to a lack of a favorable environment for farmers to thrive. Alao, Shaibume, Ogunwemimo, Alao, and Ogunwemimo (2019) also made similar statements about an increasing wave of insecurity capable of damaging the food supply.

Climate Change and Food Security in Nigeria

The Intergovernmental Panel on Climate Change (IPCC, 2001) viewed climate change as "any change in climate over time caused by natural variability or human action that modifies the composition of the global atmosphere." As a result, climate change is described as the gradual

alteration or modification of the composition of the earth's atmosphere caused by numerous human activities, both directly and indirectly, and regular climate fluctuation over time. While weather affects our daily lives, climate affects our decisions about where and how to live and how to cultivate food, all of which directly impact how communities and economies evolve and prosper (Osuafor and Nnorom, 2014).

The term, also used interchangeably with global warming, refers to an increase in the average air temperature on Earth over time (Oxford Dictionary of Science, 2005). The causes of climate change are as varied as they are complex. External causes include solar output variations, earth orbit variations, volcanic eruptions, mountain construction and tectonic movements, and other human-induced phenomena accelerated by the Industrial Revolution of the last two and a half centuries. The causes of climate change, according to Okebukola and Akpan (2009), are split into two categories: those induced by natural causes and those caused by human activities. Continental drift, volcanoes, ocean currents, the earth's tilt, comets, and meteorites are all-natural forces.

Climate change and agriculture are two interconnected phenomena that occur globally. Climate change, which often manifests in greater temperatures, decreased rainfall, and increased rainfall unpredictability, affects crop yields, diminishes net farm earnings, and jeopardizes food security in low-income nations, especially African countries (FAO, 2007 & Achike, 2014). It is already harming crop output in many countries. This is especially true in low-income nations where the climate is the key predictor of agricultural productivity with limited adaptive capacity (Apata, Apata, Igbalajobi, and Awoniyi. (2010). Nigeria, though is yet to face the kind of food crises of its immediate neighbors, Niger or Chad, but its hunger profile is deplorable, with climate change exacerbating the situation.

With 85 percent of her agriculture being rain-fed and many crops sensitive to even minor changes in rainfall and temperature, evidence revealed that Nigeria is already plagued by various ecological issues and imminent food shortages, both directly related to global warming. The southern region of Nigeria is largely known for high rainfall but is confronted with an irregularity in its rainfall pattern, and the Northern region is confronted with the threat of desert encroachment at a very fast rate per year caused by a rapid reduction in the amount of surface water, flora and fauna resources on land, the country is approaching a tipping point, with

imminent hunger and starvation staring it in the face (Bello, Ganiyu, Wahab, Afolabi, Oluleye, Ige and Abdulmaliq, 2012).

With the advent of climate change and global warming, Nigeria's over-reliance on rainfall for over 80% of crop production would undoubtedly have major ramifications for crop yield and, thus, food security. The study contends that the continuous movement of nomadic herdsmen and armed bandits from Nigeria's Northern axis to the Southern coastal states in search of greener pastures is largely driven by the effect of climate change due to desertification and or desert encroachment, including a lack of rain for their cattle. Furthermore, changes in climatic conditions have harmed the sustenance of many herders in neighboring African countries such as Chad, Cameroon, Niger, Mali, and Senegal. As a result, they continue to migrate southwards due to irregular or reduced rainfall in the north, leading to the search for greener pastures and a more friendly habitation by these nomadic herders. All of these factors contribute to and/or induce increased forcible relocation of farming communities, which has a negative impact on food production and Nigeria's food security targets. The government should devise further measures to stem the tide of global warming, which is already affecting food production in many parts of the world, particularly Nigeria.

The above findings are corroborated by Akukwe, Oluoko-Odingo, and Krhoda (2020), who, in their study of South-Eastern Nigeria, found that flooding had a detrimental effect on food security by increasing the number of food-insecure households. Furthermore, Osuafor and Nnorom investigated the impact of climate change on Nigeria's food security in 2014. They found that the threat of environmental degradation caused by climate change negatively impacted food production in Nigeria. Similarly, Eme and Onyishi (2014), Okoli and Ifeako (2014), and Azubuike and Nnubia (2015) all alluded to the fact that climate change precipitates food insecurity in their investigations.

Theoretical Review

Sen's Theory of Poverty and Famine: An Essay on Entitlement and Deprivation

This theory, propounded by Sen (1981), tied its arguments to the fact that hunger and famine have been largely rooted for a very long time in postulations made by Thomas Malthus's food availability approach. Sen did not contribute to challenging Malthus's (1798) stance on food security until the early 1980s when attention was shifted from national food availability to people's access to food in a dissertation on "entitlement and

deprivation". The emphasis on food security in the entitlement discourse was an insistence on each individual's entitlements to commodity bundles, including food, by viewing famine as a result of households' failure to be entitled to the bundle(s) that assures them sufficient food to improve their welfare (Sen 1981).

It is worth noting that Sen's interest in starvation stems from his personal experience during the 1943 Bengal famine, which killed around 3,000,000 lives. Sen believed that this alarming loss of life was unnecessary because it was thought that the lack of adequate food supply in India at the time was not necessarily the cause but that its distribution and accessibility were harmed and impeded as a result of certain groups of people, such as rural laborers, losing their livelihoods and jobs, and thus their inability to purchase the food they so desperately needed for sustenance. This much was confirmed in Sen's Poverty and Famines: An Essay on Entitlement and Deprivation (1981), which revealed that in many instances of famine, except in cases of war and conflict affecting farming communities, food supplies were not necessarily reduced, but rather a combination of socio-economic factors, such as declining wages, corruption, poverty, changing climatic conditions, higher food prices, unemployment, poverty, a lack of government commitment to agricultural growth. The author's propositions influenced the thinking of many nations and other international organizations in handling food crises as many of these countries who were influenced by Sen's thinking and views encouraged policymakers to devote attention and emphasis not just to alleviating or reducing immediate sufferings among households but also to work towards finding workable ways to replace the lost income of the poor which trigger hunger.

Sen's Poverty and Famine Hypothesis - An Essay on Entitlement and Deprivation, which examined the socio-economic factors that influence food insecurity among nations, is the theory that best answers the discourse on conflicts, changing climatic conditions, and food security in Nigeria. This is due to the robustness and logicality of its assumption; hence, it has been adopted for this study.

Model Estimation

Model Conceptualization

To aptly capture the effect of conflicts and climatic changes on Nigeria's food security, a conceptual model was designed to clearly depict the relationship and interaction between the dependent (food security) and the independent variables. The model is intended to demonstrate how

conflicts (insecurity), climatic changes, and other associated determinants of food production affect food security in Nigeria.

Model: Conflicts, Changing Climatic Conditions and Food Security in Nigeria

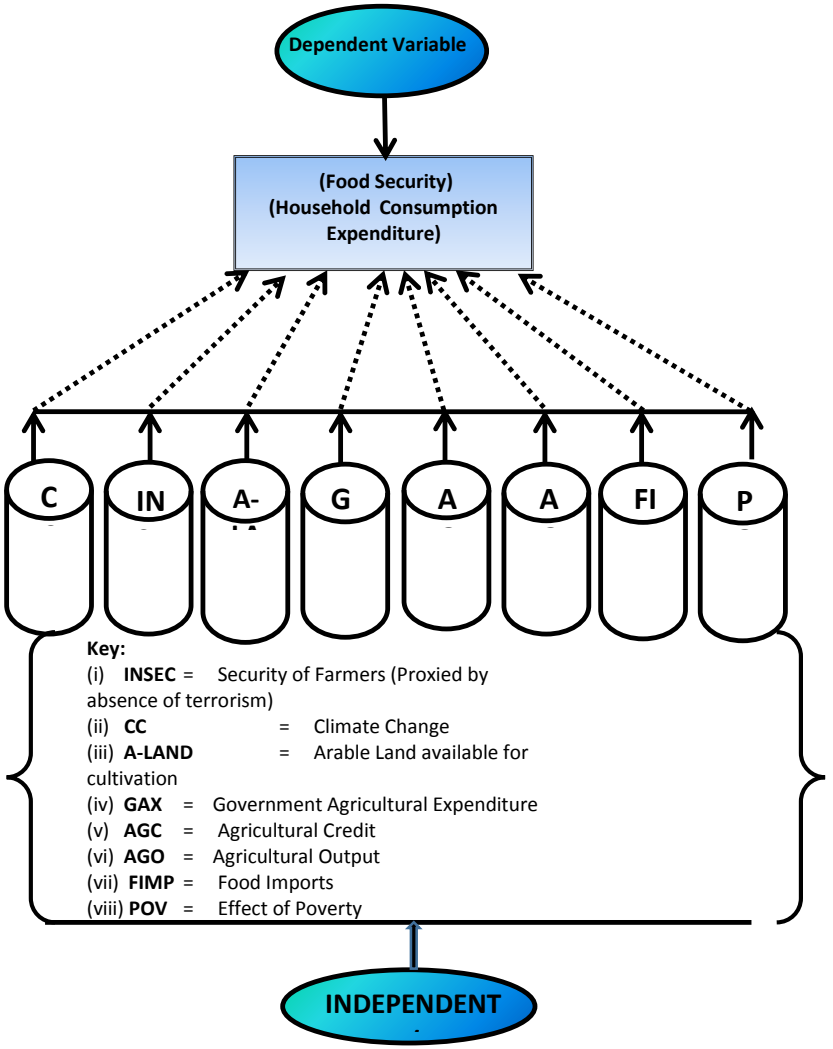


Figure 2: Conceptual Model on Conflicts, Climatic Changes and Food Security in Nigeria

Source: Author's design

Theoretical Framework

This research model is based on Sen's theory of Poverty and Famine and is derived from Sen's proposition that the causes of food crises and famine in many countries around the world are not simply a result of a food supply gap but that food insecurity globally is precipitated or a consequence of several socio-economic factors including changing climatic conditions and conflicts (e.g., attacks against farmers), declining wages, unemployment/underemployment, the effect of a growing population and food prices. The theoretical model is as represented:

(a) Conflicts, Climatic Change and Food Security in Nigeria

$FdSec = f(INSEC, CC, AL, GAX, AGC, AGO, FIMP, POV)$ ….. $(Eqtn\ 3.1)$

Specification of the Models

Accordingly, the study utilized an Autoregressive Distributed Lags (ARDL) technique with a basic connection description as illustrated in Equation (3.1). As a result, the explicit form of the model becomes:

$$\Delta FdSec = \alpha_o + \beta_1 INSEC + \beta_2 CC + \beta_3 AL + \beta_4 GAX + \beta_5 AGC + \beta_6 AGO + \beta_7 FIMP + \beta_8 POV + \mu_t \quad \ldots. 3.2$$

Where:

FdSec = Food security (proxied by Household's consumption expenditure)
INSEC = Security of farmers
CC = Climate change
AL = Arable land available for cultivation
GAX = Government agricultural expenditure
AGC = Agricultural credit to farmers
AGO = Agricultural output
FIMP = Food imports
POV = Effect of Poverty
μ_t = Stochastic error term / time trend

While α_0 + β_1, β_2, β_3, β_4, β_5, β_6, β_7 and β_8 and respectively are the parameter estimates

The ARDL transformation for Equation 3.2 is stated as follows:

$$\Delta FdSec = \alpha_o + \beta_1 INSEC_{t-1} + \beta_2 CC_{t-1} + \beta_3 AL_{t-1} + \beta_4 GAX_{t-1} + \beta_5 AGC_{t-1} + \beta_6 AGO_{t-1} + \beta_7 FIMP_{t-1} + \beta_8 POV_{t-1} + \sum_{j=1}^{p} \pi_1 \Delta CC_{t-j} + \sum_{j=1}^{p} \emptyset_1 \Delta INSEC_{t-1} + \sum_{j=1}^{p} \partial_1 \Delta AL_{t-1} + \sum_{j=1}^{p} \delta_1 \Delta GAX_{t-1} + \sum_{j=1}^{p} \emptyset_1 \Delta AGC_{t-1} + \sum_{j=1}^{p} \theta_1 \Delta AGO_{t-1} + \sum_{j=1}^{p} \rho_1 \Delta FIMP_{t-1} + \sum_{j=1}^{p} \varphi_1 \Delta POV_{t-1} + \mu_t \quad 3$$

A general error-correction representation of the equations above is formulated as follows:

$$\Delta FdSec = \alpha_0 + \sum_{j=1}^{p} \pi_1 \Delta INSEC_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta CC_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta AL_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta GAX_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta AGC_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta AGO_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta FIMP_{t-j} + \sum_{j=1}^{p} \pi_1 \Delta POV_{t-j} + \delta_i ECM_{t-j} + \mu_t \quad 4)$$

Results and Discussions

Tests for Stationarity

The stationarity test on all variables in the model(s) was performed using ADF and PP procedures to ascertain the order of integration of each variable. Table 1 summarizes the results of the ADF and PP unit root tests.

Table 1: ADF and Phillips-Perron Unit Root Test

Variable		Level		1st Difference		5% critical	
Order of							
		t-statistic	value	t-statistic	value	value	Integration
Log(FdSec)	ADF	-3.622137	****			-2.895109	I(0)
	P-P		-4.618824	****		-3.459950	I(0)
INSEC	ADF		****	-3.431079		-2.895512	I(1)
	P-P		-3.993191	****		-2.893589	I(0)
Log(CC/WVR)	ADF		-5.652006	****		-3.012363	I(0)
	P-P		****	-5.660809		-3.012363	I(1)
Log(A-LAND)	ADF	****		-2.253462		-1.944619	I(1)
	P-P		****		-4.097222	-2.893956	I(1)
Log(GAX)	ADF	****		-4.253627		-2.893956	I(1)
	P-P		****		-4.175098	-2.893956	I(1)
Log(AGC)	ADF	-3.051057	****			-3.012363	I(0)
	P-P		****	-4.309974		-2.893956	I(1)
Log(AGO)	ADF	****		-3.138214		-2.895512	I(1)
	P-P		****		-4.458585	-2.893956	I(1)
Log(FIMP)	ADF	****		-2.945851		-2/897223	I(1)
	P-P		-2.987312	****		-2.893589	I(0)
POV	ADF		****		-3.319148	-2.897223	I(1)
	P-P		-3.112550	****		-2.893589	I(0)
Log(POGR)	ADF	-4.862665	****		-3.029970	I(0)	
	P-P		-3.032476	****		-3.004861	I(0)

Source: Extracts from E-views 10

The results of the unit root test, employing both Augmented Dickey-Fuller (ADF) and Phillips-Perron (P-P) at the level and first difference, are shown in Table 1. The unit root test verifies that the variables in the models are of zero-order I(O) or I(1) integrated, i.e., first difference stationary. If the critical value in absolute terms is less than the test statistic, the variable is believed to be stationary (has no unit root problem). After confirming the stationarity of the model's variables, the long run relationship between them will be determined. However, because the unit root test result revealed a mixed order of integration, the Autoregressive Distributed Lags (ARDL) bound test for co-integration popularized by (Pesaran & Shin, 1999; Pesaran, Shin, & Smith, 2001) was used.

Lag Selection Criteria

Before delving into the cointegration test's complexities, choosing a suitable lag length was crucial. The lag length was selected to determine the appropriate number of lags selected for model estimation using explicit statistical information criteria obtained through unrestricted VAR estimate. The Akaike Information Criterion, the Schwartz Information Criterion, the Posterior Information Criterion (PIC), and the Final Prediction Error were some statistical information criteria (FPE). The study employed the Akaike Information Criterion as one of the lag selection criteria.

Table 2: Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2823.127	NA	1.21e+23	67.33635	67.48104	67.39452
1	-2172.023	1209.193	4.05e+16	52.42911	53.29726	52.77810
2	-2082.769	155.1307	8.83e+15	50.89927	52.49088	51.53908
3	-2072.806	16.13087	1.28e+16	51.25729	53.57235	52.18793
4	-2065.417	11.08340	2.01e+16	51.67660	54.71512	52.89806
5	-1916.276	205.9572	1.10e+15	48.72085	52.48283	50.23314
6	-1856.365	75.60167*	5.19e+14*	47.88964*	52.37508*	49.69275*
7	-1847.572	10.04885	8.55e+14	48.27553	53.48442	50.36946
8	-1838.171	9.624885	1.45e+15	48.64693	54.57929	51.03169

Source: Author's extract from E-views 10;

Note: * indicates lag order selected by the criterion.

From Table 2, the lag selection test indicates the following lag order: Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ). The lag test determines the number of lags to include in the model estimation process, as well as the duration of the lag that produces the smallest critical value and most efficient parameter coefficients/estimates. The maximum number of lags that could be taken in this study was determined to be six, utilizing the Akaike Information Criterion (AIC), and this was selected for the estimation of a parsimonious model.

Cointegration Testing Using ARDL Bounds

A cointegration test is one of the most certain ways to determine whether or not there is a long-run linkage between series in a model. Cointegration of two or more variables is defined economically as the existence of a long-run or equilibrium relationship between or among variables or series in the model (Gujarati, 2004:822). Given that not all variables were integrated in the same order, but rather a combination of I(O) and I(1), the ARDL bounds testing method to cointegration (Pesaran *et al*. 2001) was used to determine if there is cointegration or a long-run relationship between the independent and response variable (food security) in Nigeria during the referenced periods. As a first step, the cointegration test devised by Pesaran *et al*. (2001) is used to establish the existence (or absence) of a long-term link between the variables, and the results are summarized in Table 3.

Table 3: ARDL Bounds Testing

Test Statistics	**Value**	**K**
F-Statistic	5.347353	9
Critical Value Bounds		
Significance	I(0) Lower Bounds	I(I) Upper Bounds
1%	2.65	2.99
5%	2.14**	3.3
10%	1.88	2.99

Note: ** signifies rejection of the null hypothesis at 5 per cent level of significance

Source: Author's Extract from E-views 10

The Wald Test F-statistics computed using the ARDL Bounds Testing yielded a value of 5.347353, which is higher and above the upper and lower bounds of the 95 percent critical value interval (2.14 – 3.3). This gives room for rejecting the null hypothesis that there is no long-run link between the variables, hence, it is concluded that there is evidence of a unique long-run cointegrating relationship between food security and the independent variables in the model for Nigeria between 1999 and 2021.

ARDL Long-run and Short-run Estimates:

The Autoregressive Distributed Lags (ARDL) long-run relationship and associated short-run dynamics are used. With a significant rural and agrarian population, food security and agricultural productivity are intricately related in Nigeria. As a result, indices affecting the country's aggregate food production include the security of farmers and farming communities, changing climatic conditions, government agriculture spending, and availability of agricultural loans/credit to farmers, food imports, and poverty. Thus, the model was designed to examine the nexus between conflicts (insecurity, changing climatic conditions, and food security in Nigeria.

Table 4: ARDL Regression Results

Dependent Variable: Hwfare				
Variable	**Coefficient**	**Std Error**	**t-statistic**	**P-value**
A: Long-run Estimates				
INSEC	0.549348	0.159742	3.438976	0.0010
CC	0.000002	0.000001	2.594696	0.0116
A_LAND	-0.000000	0.000000	-8.179748	0.0000
GAX	0.392629	0.105516	3.721027	0.0004
Constant	27.047957	0.323256	83.673367	0.0000
B: Short-Run Estimates	**Coefficient**	**Std Error**	**t-statistic**	**P-value**
D(INSEC)	-0.089136	0.018975	-4.697460	0.0000
D(CC)	0.000001	0.000000	5.191363	0.0000
D(A_LAND)	-0.000000	0.000000	-18.470426	0.0000
D(AGO)	0.006096	0.001163	5.242117	0.0000
D(GAX)	-0.095446	0.011588	-8.236339	0.0000
D(FIMP)	0.003246	0.000545	5.960804	0.0000
D(POV)	0.000305	0.000149	2.043660	0.0449
ECM(-1)	-0.069973	0.010016	-6.986316	0.0000

Source: Author's computation from E-views 10

Note: Only variables that had significant effect on the outcome / response variable are presented

Table 4 presents the effects of the explanatory variables on the outcome variable (food security) in Nigeria. From Table 4 (A and B), the interaction between insecurity (INSEC) and food production has reported a statistically significant relationship with food security in Nigeria. These have implications for food security, given that the continuance of these attacks on farmers had impacted aggregate food production during the period examined. Additionally, Table 4(A and B) indicated that during the referenced period, changing climatic conditions with adverse effects such as droughts, flooding, and other environmental hazards exerted disproportionate impacts on different crop yields, resulting in low output and irreversible food insecurity among households. Both long and short run regression estimates revealed that a unit rise in agricultural output resulted in a corresponding increase in Nigeria's aggregate food stock. However, during the same study period, it was discovered that food production stagnated or suffered due to a lack of arable and cultivatable land, perhaps due to the activities of pastoralists and the effect of flooding that negatively influences the performance of cultivable land.

Similarly, during the quarters analyzed, it was revealed that government expenditure on agriculture positively influenced food production in the long run. However, the reverse was the case in the short term, as it had a detrimental effect on the food supply in Nigeria. That is, each unit decrease in food production resulted from a fall or decline in government investment in the agricultural sector. The short run negative effect of government agricultural spending on food production is not unconnected to the activities of unscrupulous and corrupt elements who have rendered government investment in the sector fruitless.

Furthermore, it was reported that rising poverty among several households had negative implications for enhanced and sustainable food production in the country. The type of poverty prevalent in Nigeria could potentially obstruct households' food security aspirations, given that their purchasing power had collapsed. Again, short-run estimates for the effect of food imports (FIMP) on food security revealed a positive and significant influence during the study period.

The slope coefficient of the error correction term (-0.069973) represents the rate of adjustment and is also consistent with the long-run equilibrium

convergence. Given system innovation, the error correction term suggested that it will take approximately 7 percent, i.e., one year, four months, and a two-week speed of adjustment to attain equilibrium in the system. Although the rate of adjustment is rapid, the ultimate convergence to an equilibrium state is contingent on the effectiveness of government initiatives to resolve Nigeria's food security crisis. The adjusted R-squared of 95 percent and statistically significant F-statistics at the 1% level indicate that the model is well-fitted and explained. This means the predictors or independent variables adequately explain the conflicts, climate change, and food production model.

Post-estimation Analysis

Robustness Test

The results were subjected to various econometric and/or parametric tests to confirm the robustness of the model estimates for the food security conflicts and climate change equation. These tests were for serial LM correlation, heteroscedasticity, Ramsey test, and normality test of the residuals. The diagnostic estimates are summarized in Table 5.

Table 5: Residual Diagnostic Tests

Description	**Model 2 P-value**	**Decision based on Statistical Test**
Breusch-Godfrey Serial Correlation LM Test	0.1400	Insignificant, No Serial autocorrelation
Heteroskedasticity Test: B-Pagan-Godfrey	0.4563	Insignificant, residuals are homoscedastic
Ramsey test (Model Mis-specification)	0.2040	Insignificant, free of multicollinearity
Normality (Jarque Berra) Test	0.6321	Insignificant, series are normally distributed

*** indicates 5% significance level*

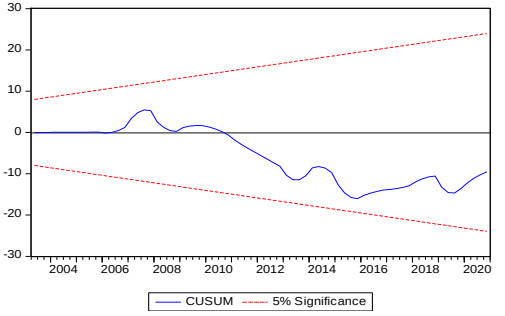
Source: Extracts from E-views 10

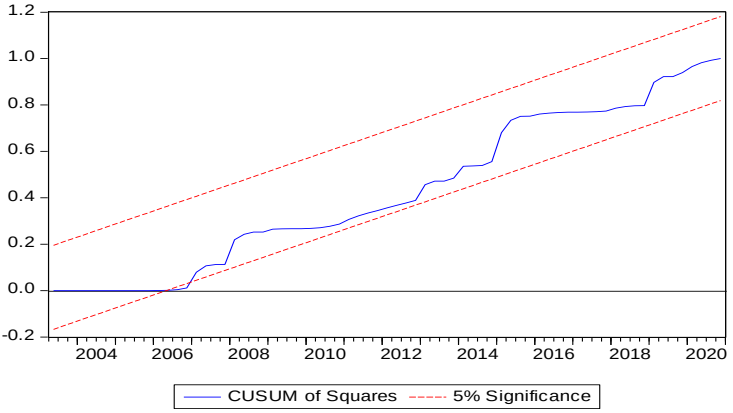
The results in Table 5 highlight the equation's robustness and validity. The statistically insignificant probability values associated with the various measurements substantiate this. The model's residuals are homoskedastic and lack a strong presence of serial correlation. As a result, heteroscedasticity is ruled out in the residuals, and they are concluded to be homoscedastic. Additionally, the models were free of substantial multicollinearity concerns and normally distributed. This is based on the insignificant values of the RAMSEY RESET and Jarque Berra Normality test probability values, indicating that the series was appropriately defined. Thus one can conclude that the parameter estimates are legitimate and reliable.

Examining Models for Structural Defects

Determining whether the short-run and long-run associations remained stable during the study's duration is important. In doing this, the recursive residuals (CUSUM and CUSUMSQ) were used to determine the structural stability of the equations in the models. Unlike the Chow test, which needs break-point specification, the recursive residual tests can be employed even if the break-points are unknown. Also, while the CUSUM test computes the cumulative sum of recursive residuals based on the first n observations and plots it against the break-point iteratively, the CUSUMSQ test employs recursive residuals squared. If the CUSUM and CUSUMSQ plots remain under the 5% significance level's critical bounds, the null hypothesis that all coefficients are stable cannot be rejected; other than that, the null hypothesis is rejected, especially if one or more of the parallel lines significantly cross the upper and lower bounds. Thus, in observing the statistics in Figure 3, they confirm and validate the fact that the conflicts, changing climatic conditions, and food security model do not exhibit substantial instabilities enough to cause significant changes in the estimated parameters in the event of innovations, given that the trend is bounded within the 5% level of significance. In other words, the model is robust and fits the prerequisites for making unbiased statistical judgments, which qualifies it for policy formulation.

Conflict, Climate Change and Food Security Equation





Discussion of Findings, Conclusion and Recommendations

The preceding ARDL long-run and short-run regression revealed the following significant findings: The long and short-run output from Table 4(A and B) is quite revealing. To clearly situate the significance of the results deduced from Panels A and B, a negative (-) sign connotes the presence of insecurity situation whereas a positive (+) sign signify the absence of insecurity in the land. Therefore, the long-run estimates (INSEC), as revealed in Table 4(A), typify a period in our national life when political violence and terrorism were non-existent or completely nib in the bud.

That 'long-run' scenario was simply an assumption, which Keynes (1939) concluded was, at best, illusionary, as in the long run, we are all dead. Consequently, the short-run inverse relationship between 'insecurity' and food production becomes germane to our analysis of food security as it relates to our current environment, soaked with political instability, violence, and terrorism, particularly itinerant conflicts between Boko-Haramists, herdsmen, bandits, kidnappers and farmers which have had detrimental effects on the Nigerian economy and her food system.). To be precise, the output connotes the fact that improving food production in Nigeria was contingent upon government's commitment to fighting insecurity and creating a conducive environment devoid of political instability, violence, and terrorism, particularly itinerant conflicts between Boko-Haramists, herdsmen, bandits, and kidnappers and farmers, which have had detrimental effects on farmers and farming communities in Nigeria.

Given the prevalence of conflicts, particularly in ungoverned places (rural areas), where the majority of farming activity occurs, any investment and expectation of increased yields or food production would be a mirage and illusionary. This implies that in the presence of widespread insecurity (terrorism, most notably Boko-Haram attacks, banditry, herdsmen-farmers conflicts, and kidnapping), which results in mass killings and the multiplication of internally displaced person homes, there is little hope for viable farming activities and thus the infinitesimal increase in food production. There is no doubt that insecurity has a detrimental effect on food production and undermines the country's quest for food security. Consequently, given the continuation of these attacks on farmers and farming communities, any Nigerian government investment in the agricultural sector will have little or no positive effect. Moreover, these attacks can stall sustainable agriculture, and when sustainable food production fails, food insecurity becomes the norm. Ukoji *et al*. (2019), Fadere *et al*. (2019), Campbell (2018), Adebisi *et al*. (2017), Adebayo (2013), Nwagwu (2014), Navarro (2017), and Ojogho *et al*. (2015) all endorsed these findings in their studies. Furthermore, Tanko (2021), Ladan *et al*. (2020), Alao *et al*. (2019), and Ilo *et al*. (2019) also made similar statements about an increasing wave of insecurity capable of damaging food supply, while Ndubueze-Ogaraku *et al*. (2017) equally emphasized in their study that increased food costs were among the shocks individuals faced as a result of a lack of a favorable environment for farmers to thrive.

Again, the impact of climate change (CC) on food security, as revealed by the ARDL estimates, spells doom for Nigeria's goal of becoming a food-secure nation. Changing climatic conditions such as droughts, flooding caused by rising sea levels, and excessive rains imply not only sustainable food production but, by extension, access and stability of access, and given its severe repercussions in the recent past, the country's food security goals would remain illusory. Nigerian farmers battle with a web of climatic and environmental disasters, including low or insufficient rainfall (drought), followed by catastrophic flooding events that yearly wipe out tonnes and millions of acres of agricultural land and farm produce, particularly rice, which has become a cause for concern. Except the government's evolving time-tested measures, the country may find itself almost unable and incapable of responding to the unjust and

unfavorable weather conditions, particularly flooding, that have become the new normal in Nigeria. This is because natural disasters are frequently beyond man's control. Hence, the government might be helpless and incapacitated to deal with it when these natural phenomena occur, especially when funds appropriated for projects such as flood control and building irrigation systems/dams for conservation of flood water get misappropriated by unscrupulous government officials, leaving the food sector to suffer. This finding is corroborated by Akukwe *et al*. (2020), Osuafor *et al*. (2014), Eme *et al*. (2014), Okoli *et al*. (2014), and Azubuike *et al*. (2015), all of whom concluded that climate change precipitates food insecurity in their investigations. Additionally, other researchers such as George, Adelaja, and Weatherspoon (2020), Ogbo, Ebele, and Ukpere (2013), and Ayinde, Muchie, and Olatunji (2011) posited that climate change is the key driver of conflict in several parts of Nigeria which has worsened the food security situation in the country, thus reinforcing poverty in some communities.

This study concludes that conflicts and climate change significantly negatively influenced food production and households' food security during the period studied. To this connection, this study holds that Nigerian households were food insecure between 1999 and 2021. Thus the following recommendations were made for policy implementation.

i. For enhanced food security, the government should earn for more sustainable food production, which they can achieve by improving security. Thus, security agencies should go beyond their present propaganda and grandstanding and provide a peaceful environment for farmers. They should be more proactive and devise workable strategies to de-escalate growing tension across Nigeria's six geopolitical zones and the federal capital territory to enable farmers to return to more productive farming activities as soon as possible.
ii. The government and the private sector should collaborate towards evolving global best practices in livestock management, such as grazing reserves and ranching, to reduce the conflicts associated with roaming or wandering animals into people's farms.
iii. Smart food systems or agricultural techniques that are resilient to the effects of climate change should be adopted to ensure sustainable food production in Nigeria.

iv. To stem the tide of rising sea levels across the major rivers in the country, the Nigerian government should prioritize the dredging of her rivers, notably Rivers Niger and Benue, to reduce the effect of overflow, which often results in flooding that destroys food crops, particularly rice, during the rainy season.

v. The Nigerian government should involve the mass media, community leaders, and religious bodies in sensitization/campaigns to farmers and pastoralists on best practices to reduce the recurrent conflicts between pastoralists and farmers as well as ameliorate the tide of global warming, which is already affecting food production in Nigeria.

vi. To further mitigate the impact of changing climatic conditions, such as flooding on food production and Nigeria's food security targets, the government should build dams to conserve the flood waters for possible utilization for dry season farming.

vii. Creating formal employment opportunities and income-generating activities for all qualified Nigerians holds the potential for deescalating tensions (insecurity) across the country. It will also further empower households to have adequate access to nutritious food, thus making them food secure.

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