



IMPLICATIONS OF CLIMATE CHANGE AND FOOD CRISIS ON WOMEN FARMERS IN CONTEMPORARY NIGERIA

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ABSTRACT: *Agriculture and food security are two important components of a sustainable future and wellbeing of the people that are adversely affected by climate change and global warming, especially in the growing economies of the world. While agriculture is the mainstay of most of such economies, it serves as an important employer of labour and source of income for the people, and provides the foundation for food security which is the state of having reliable access to sufficient, affordable, safe and nutritious food supply that adequately meets the needs of its users. Climate change and global warming are two important challenges adversely affecting the people (especially the poor and the highly vulnerable female-headed farming households in Africa and particular in Nigeria), as a result of which their livelihoods and wellbeing are increasingly endangered by the scourge and related challenges of low disposable income; poor soil quality (nutrients); high levels of poverty, illiteracy and unemployment; feminization of agriculture; and lack of opportunities for meaningful development. This study examines the inter-links between climate change and food crisis, which breeds food insecurity among the people, especially female-headed farming households in Nasarawa State. The study is a descriptive survey which utilized primary and secondary sources of data, using questionnaires, FGD (Focus Group Discussion), and elite interviews. It posits that climate change is an important driver of socio-economic challenges that affects female-headed farming households more disproportionately than their male counterparts. The study suggests that though climate change is an important global challenge, it is more so among resource-poor farmers that must be appropriately responded to, especially in Africa where its effects are most harsh. The study recommends that gender friendly policies and practices will ensure effective and equitable gender participation in sustainable agriculture essential in food security and wellbeing of the people.*

KEYWORDS: Climate change; agriculture; food security; households; women.



BACKGROUND TO THE STUDY

As the foremost and oldest industry in the world (and Nigeria of today and yesteryears), agriculture is an age-long (livelihood and survival) activity that is becoming increasingly so in contemporary Nigeria for its rapidly growing population size, rising local industrialization of the country, and increasing international demand for its produce. This activity is as old as man, as well as the mainstay of the nation's economy, which accounts for 40 percent of Nigeria's non-oil export, thus making it a reliable source of employment, income, and foreign exchange earnings for the country. Agriculture is a key livelihood activity that serves as a source of food security that is however susceptible to many challenges that border significantly on the climatic conditions, socio-cultural practices and state policies that are however amenable to research and technology, global best bet practices like sustainable land management (SLM), which is land use type that meets the changing needs of man, while simultaneously encouraging the long-term productive potential of these resources and the maintenance of their environmental functions (FAO, 2011).

Agriculture is the backbone of Nigeria's economy, employing over seventy-five per cent of the population, with land (and its resources) as its chief asset, by virtue of which most of the country's households are farmers, amongst which the highest poverty level in the country is found. In response to these challenges, the Nigerian government has set out several policies and strategies to deal with these realities, as well as signed a number of international treaties and declarations on environmental protection, essential in sustainable agriculture, food security and wellbeing of the people (Abu, 2012).

Worldwide, the climate condition of the earth is gradually changing with far-reaching and disproportionate implications for the people, and hence the corresponding growing imperative for right actions to mitigate its vagaries. Climate change, global warming and gender inequality are important features of our time that bring about new and aggravated demands with significant toll on the lives of the people and the ecosystem (World Bank, 2011). Climate change is not only influencing important changes in rural areas, but imposing important constraints that vary with gender and households that make them incur huge losses and suffer greatly from its vagaries like reduced/erratic rainfall, increased temperature and heat stress; low crops yields and failure of trees; loss of livestock; spreading of diseases; displacement of people; low income; rural-urban migration; and increased vulnerability, among other challenges (Mulunda, 2007).

As a global high risk issue, climate change affects the daily lives of people in developing countries more, where the awareness and knowledge of, especially among the rural women farmers, remain abysmally low. It includes global warming and everything else that leads to increased greenhouse gas emission into the atmosphere. For instance, in sub-Saharan Africa, this problem is adding to existing developmental challenges, thereby making it imperative that its essential knowledge and awareness be provided by stakeholders for building climate change resilience and adaptation (UNFCCC, 2022). The climate change phenomenon is both natural and anthropogenic in nature. The former occur for millions of years as a result of which the earth's biosphere has been exposed to a large variability and extremes of adverse conditions. The latter, on the other hand, is livelihood-induced, occurring over a much smaller time scale. As important parts of the current global epiphenomena of globalization and industrialization, climate change and global warming have significant and often disastrous consequences on developing countries (especially the female headed farming households), where its awareness



and coping measures are somewhat low, as a result of which they deploy indigenous techniques (that are not effective) to cope or recover from its vagaries. Climate change alters the quantity, quality, timing, and flows of ecosystem services, thereby creating devastations and vulnerabilities for individuals, communities, sectors and groups that are into climate-vulnerable agricultural practices (Perez *et al.*, 2015).

Although women comprise nearly half of the world's agricultural workforce and food crops' producers, they however have less access to quality productive resources and opportunities than the men. Improving women's access could increase agricultural yields by 25 to 30 per cent and increase agricultural output in developing countries (like Nigeria) by between 2.5 and 4 per cent (World Bank, 2011). Prioritising women's needs and interests is very important in increasing food production and food security by facilitating measures that would ease their tasks and lessen their burdens, leading to significant agricultural and other benefits (Rose & John, 2022). In spite of their daunting challenges, women play a significant role in a wide range of activities that support agricultural development, like soil and water conservation, afforestation, and crop domestication. They are also knowledgeable in seed selection, vegetative propagation and reproduction, food availability, food access (distribution), and food utilization, thereby significantly contributing towards food security and development of their countries (FAO, 2011; Duflo, 2012).

AIM AND OBJECTIVES

The paper examines the link between climate change challenges and food crisis amongst female farmers' households and its implications on coping strategies and sustainable agriculture in three LGAs (Awe, Lafia, and Obi) of the southern zone of Nasarawa State, with a view for its findings to contribute towards achieving UN Sustainable Development Goal 2, which aims to end hunger, achieve food security, improve nutrition and promote sustainable agriculture.

The study posits that the climate change phenomenon is an important driver of socio-economic and cultural changes that affect agriculture and farming households in many adverse ways, with far reaching implications on their survival and wellbeing, because of the following:

- i. Over dependence of the people on the environment for subsistence in agriculture and other rural livelihood activities, i.e., agricultural land use intensification.
- ii. Intensification of climate change induced activities and corresponding havocs due to the poor coping capacity of the people (especially female farmers).
- iii. High vulnerability of the people and failure to adhere to basic ecosystem based approaches and global environmental best practices in their activities, and the belief system of the people among others.



LITERATURE REVIEW

Women Farmers' Households and Climate Change in Nigeria

The lack of women's access to essential agricultural development resources does not only increase hardships for women (and their families), it places an extra burden on the entire agricultural sector, the broader economy and society as a whole. As FAO's State of the Food and Agriculture report 2011 states: "If women had the same access to productive resources as men, they could increase yields on their farms by 20–30 percent" (FAO, 2011).

As a global high risk issue, climate change affects the daily lives of people (especially female farming households) in the rural areas of developing countries more, where the awareness and knowledge of the scourge, its adaptation and coping strategies are very low, owing to lack of requisite resources and opportunities for meaningful growth and development, especially the rural women farming households, whose heads are saddled with additional and debilitating responsibilities of breadwinning, support and caregiving, in addition to their traditional responsibilities as heads of households than the men (UN, 2009). This problem is adding to the existing challenges of the people, thereby making its knowledge and awareness an important imperative in building climate change resilience and competent adaptation, for UN Sustainable Development Goal 13, which aims to ensure that the impacts of climate change are combated through necessary and urgent actions.

According to the World Bank (2021), women constitute more than half of the global population and are more vulnerable to poverty. In Nigeria, they constitute about 60–80% of the country's labor force, produce two-thirds of its food crops, and engage in various activities that support and sustain their families and the society at large (Lateef *et al.*, 2021). Female headed households and families are more income-poor and vulnerable than their male counterparts. They are also the ones at the forefront of climate change challenges. In many developing societies, the traditional responsibilities of women and girls such as growing food, collecting water and fuel, and serving as caregivers, tie them closely to available natural resources and the ecosystems, and, hence, whenever the environmental conditions of an area results in ecosystem changes, it is often these women and girls who are the most adversely affected (Action-aid, 2023).

Women constitute over 50 percent of the agricultural labour force in Nigeria, with more than 70 percent of them actively engaged in agriculture as a primary economic activity. Women farmers generally play significant roles in a wide range of activities that support agricultural development, such as soil and water conservation, afforestation and crop domestication, and preserving community heritages and food supply chain. In spite of these valuable attributes, they are the most adversely affected by climate change and related issues on their strides, especially in contemporary Nigeria, where female farmers are actually more vulnerable to climate change vagaries due to poor or zero state policies on issues like women farmers, lack of opportunities in decision processes and enablement, gender instituted socio-cultural biases and stereotypes that constrain them in their farming activities and other strides (UN, 2009).

Although alterations in global environmental conditions pose the greatest threats to environmental sustainability, agriculture and food security, they impose differing impacts on women, relative to their male counterparts. Gender does not only determine men and women's



ability to cope with environmental challenges but their underlying structural inequalities can mean that those challenges have a disproportionate impact on women (Ann *et al.*, 2021).

Environmental Degradation and Food Security in Nigeria

Environmental degradation is a human induced phenomenon that lowers the current/future capacity of soil/environment to affect its ability to perform its support function or services in the ecosystem, or it is a decline, both in the quality/quantity of soil, in an environment due to improper use. Environmental degradation is an important global challenge that is exacerbated by climate change and global warming, phenomena and many unwholesome human activities like deforestation, poor agricultural and construction activities, mining and industrialization, logging, as well as urbanization and natural factors (force majeure), such as drought, soil erosion, landslides, etc. It is estimated that over half of the world's grasslands are degraded, with nearly 1.5 billion people directly affected worldwide (Stern, 2006).

Today, one of every 3 persons on the face of the earth is somewhat faced by the rising challenges posed by land degradation arising from myriads of human anthropogenic activities that result in climate change, such as acid mine drain, depletion of the ozone layer, large scale resource pollution, among others, or their effects in some ways. Currently, about 2 billion hectares of land worldwide (an area twice the size of China) is already seriously degraded. This includes large forests and crop lands whose degradation reduces agricultural productivity, disrupts vital ecosystem services, adversely affects biodiversity and water resources, and increases vulnerability to water stress, climate change, and/or its vagaries, hence the imperatives for SLM which is crucial in land integrity, minimizing land degradation, rehabilitating degraded areas, and ensuring optimal use of land resources for the benefits of both present and future generations (FAO, 2011).

Human-induced soil degradation is a common phenomenon in Nigeria that is adversely affecting agriculture, environmental serenity, aesthetics and values, and a host of other livelihood activities (Dahiru, 2017). Soil erosion is the most widespread type of land degradation in Nigeria today. It is estimated that over 25 million tons of soils are lost annually in Nigeria due to erosion. This has been recognized as a serious challenge militating against environmental sustainability, enhanced agricultural productivity, food security and rural prosperity, thereby making sustainable land management (SLM) an indispensable imperative in the country (Dregne, 1990). Soil degradation is an epic phenomenon that adversely affects agriculture in Nigeria, which manifests in the form of soil erosion, sedimentation, flooding, poor crop yields, etc., with an estimated annual loss of about \$4 billion worth of soil nutrients.

Food Crisis and Women Farming Households

As the feminine component of the human species and families, women serve as the vehicle for nurturing human life, producers, consumers, and equally endowed agents for fostering socio-political and economic development in a society. Essentially, female headed farming households are those households headed by women/female farmers who serve as their breadwinners and main support/backbone. They are families under the watch and protection of women, either as parents or guardians who fend or cater for the needs of the members, including the men in some cases. Many factors have been implicated in the development of this group of people by scholars. These factors include education, culture, health, politics, the economy, environment, mode of agricultural production, and the nature of coexistence, among others



(Alderman & Garcia, 1993). Although the numerical strength of the female gender is an indisputable fact and their contributions to national development is very significant, unfortunately however, socio-cultural factors play significant roles in their lives, such that their chances of becoming equal partners and beneficiaries of development processes are severely restricted, and this is true at both the national and global levels. A strong link has been established between poverty and female headed households, by virtue of which such households suffer disproportionately higher challenges and vulnerabilities from both natural and human induced changes and disasters in an area that affects their survival and wellbeing in terms of insecurity, low agricultural productivity and finance/income, and various opportunities compared to the male headed households. Most of these households live below the poverty line; hence, they are most vulnerable, suffering a high level of food crisis occasioned by their endemic poverty, which leaves them open to all forms of crises, deprivation, and exploitations. It is therefore important that these families put in place measures/strategies to cope with the challenges of food crisis and other equally important challenges that adversely affects their survival and development. The following strategies will help:

- Food production/agriculture based strategy
- Livestock based coping strategy
- Assets (farm and non-farm) based coping strategy
- Food procurement, storage, preparation, distribution and consumption based coping strategy
- Employment, economic and income based coping strategy, including food and nonfood expenditures (Mashewari & Khahder, 2000).

MATERIALS AND METHODS

Study Area

The study area consists of 3 out of the 5 local government areas in the southern agricultural zone of Nasarawa state (namely, Awe, Lafia and Keana). This area is chosen because of the fact that it makes a good representation of the entire state in terms of topography, natural resources, and socio economic potentials. The area has an estimated population of 2,738,295 people (NPC, 2024), with a landmass of about 27,117 km². This area has rocky and undulating highlands of about 1,400 m above sea level. The area is rich in arable lands with huge agricultural potentials, a large variety of food and cash crops, as well as a large share of economic mineral resources. Its climate is tropical, with a temperature between 60–80° F and rainfall between 1320–1450mm. Nasarawa State lies in the Southern Guinea Savanna biome of Nigeria with characteristic coarse grasses and diverse species of scattered trees that are more stunted and less dense towards the western parts. The agricultural produce in this area include yam, cassava, rice, maize, sorghum, soya beans, sesame, and groundnuts, and a host of other crops.

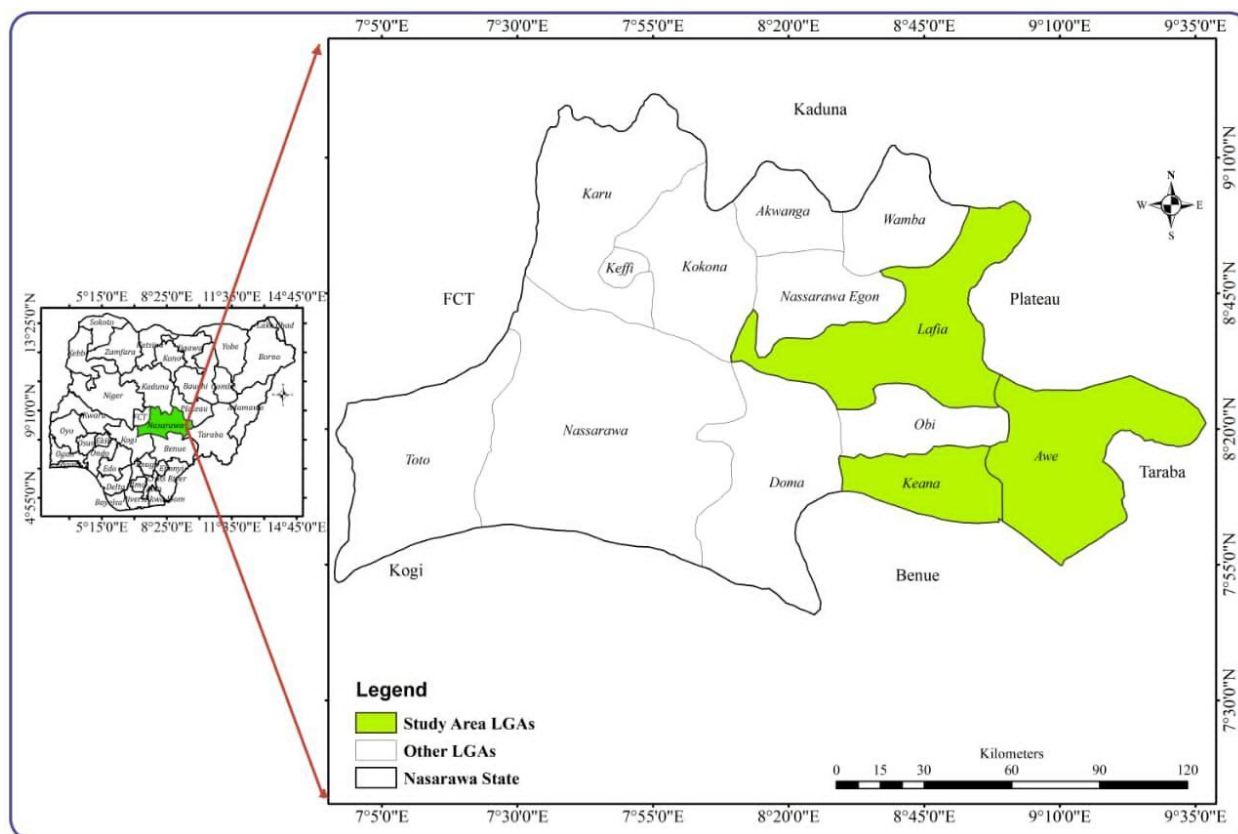


Fig. 1: Map of Nasarawa State showing Lafia, Awe, and Keana LGAs

(Source: GIS Lab., Department of Geography & Environmental Management, Federal University of Lafia)

Sampling Technique

Both purposive and random sampling techniques were used. The former was in the case of women farmers having equal chances of being selected for the investigation. Seventy-five (75) women farmers (female farming households) were sampled for the study, while random sampling was used for male farmers, where 45 male farmers or farming households were sampled. A total of 120 farmers were selected from Awe, Keana, and Lafia LGAs of the State.

Data Analysis

Data analysis was carried out with the aid of Pearson correlation analysis. The outcome shows that climate change and global warming are key challenges that adversely affect rural female headed farming households relative to their male counterparts thus:



DISCUSSION OF FINDINGS

Climate change is an important driver of socio-economic changes that affects women farmers most adversely in this study area, where despite the role of women farmers in agriculture, they face numerous challenges that limit their productivity and ability to fully participate in agricultural development. These challenges include limited access to education, finance, land ownership, input supplies, technology, extension services, markets, etc. By virtue of these, they are highly constrained, and their opportunities for economic growth, development and wellbeing are compromised, with dire consequences like low income, higher levels of poverty and food insecurity among others. The climate change challenge implies a radical change in the statistical properties of the climate system over a considerable period of time, such as the weather pattern and the overall environmental condition of an area, with implications such as erratic rainfalls, prolonged draughts, failures of crop and trees, increase in temperature, spreading of diseases, and displacement of people from communities.

Climate change impacts the following dimensions of food security and crisis:

- **Availability:** The most direct impact of climate change on food security is through changes in the food production system, which differ with gender and affects female headed households most heavily, restricting their food choice, to either what is available around, or some other food materials they can afford.
- **Stability:** The extremes of weather and climate variability are the main drivers of instability in food production, especially in rain-fed farming systems, which affect the female farming households more adversely for their high vulnerability in lack of income and opportunities. A shortage of water affects both men and women, for example, while men tend to focus on the possibility of less water for farming and production, women tend to focus more on lack of drinking water and its implications on the health of their families. Women's workload also increases as they need to travel longer distances to fetch water, or draw water from lower quality sources, and this is truer in rural female headed farming households.
- **Utilization:** Food utilization increases during weather-related disasters, and this is likely to lead to an increase in the number of men and women exposed to vector-borne diseases, which in turn lowers people's capacity to utilize food effectively, thereby compromising their food security status. With farming systems changing, there is a risk that traditional crops for food will not be available, as women, especially the female heads of households, tend to be more engaged and responsible for the households, food preparation and food security.
- **Access:** Access to food by all members of the population is as important as food availability. Women are often more vulnerable than men in conflict situations and are thus affected more than men when access to food is threatened, and this is truer for female headed households (UN, 2009).

**Table 1: Types of Climate-Related Risks and Potential Impacts on Agricultural Producers**

TYPE OF RISK	ECONOMIC CONSEQUENCES	FOOD SECURITY CONSEQUENCES	LONG-TERM CONSEQUENCES
Input price increase seeds, etc.	Reduced income for farmers	Reduced availability of food	Only to the extent it affects investment
Output price decrease	Reduced income for farmer	Reduced food access due to a decrease in farmers' incomes	Reduced incentive for investments
Weather shock	Likely crop failure or yield reduction	Reduced food availability	Depending on type shocks and productions can led to loss of productive assets
Plant pest and disease	Reduced yield	Reduced food availability; potential impacts on safety	Loss of productive capital and assets. Potential trade barriers
Animal disease	Reduced production	Reduced availability of food	Disease could last. Loss of productive asset. Potential trade barriers.

CONCLUSION

- i. Imbibe the practice of climate-smart agriculture through sustainable land management (SLM), which seeks to sustainably increase productivity and coping with climate change challenges through building resilience to shocks and variabilities (adaptation), reducing and enhancing the achievement of national food security and development goals.
- ii. Governments should ensure gender friendly agricultural policies, equal opportunities to women farmers, as well as the need for stakeholders to take urgent actions to combat climate change and its impacts, in line with the UN Sustainable Development Goal number 13.
- iii. Governments and all stakeholders should strive to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. This is in tandem with the tenet of goal 2 of the UN Sustainable Development Goals.



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