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FOOD SECURITY, CLIMATE CHANGE, AND SUSTAINABLE DEVELOPMENT: LEGAL AND POLICY PERSPECTIVES IN NIGERIA

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Food security is a crucial aspect of sustainable development, directly influencing economic stability, health, and social well-being. In Nigeria, climate change poses a significant threat to food security through extreme weather conditions, unpredictable rainfall, droughts, and flooding, which negatively impact agricultural productivity. This paper examines the intersection of food security, climate change, and sustainable development in Nigeria, analyzing existing legal and policy frameworks such as the Climate Change Act 2021,[1] the National Environmental (Agricultural Sector) Regulations 2009,[1] and the National Agricultural Technology and Innovation Policy (NATIP) 2022–2027,[1] alongside their limitations and potential reforms.. The study highlights major gaps in Nigeria's legal framework, including weak enforcement of environmental regulations, lack of climate-smart agricultural policies, insufficient land and water management laws, and inadequate legal provisions for smallholder farmers. It also examined international and regional legal frameworks, such as the Paris Agreement2015)[1] and the Comprehensive Africa Agriculture Development Programme (CAADP) (adopted in 2003),[1] which provide guiding principles for addressing climate-related food security challenges. To enhance food security, the paper recommends strengthening environmental laws, implementing climate-smart agriculture policies, supporting smallholder farmers, and integrating disaster risk reduction strategies. Aligning Nigeria's legal and policy frameworks with international best practices will foster sustainable agricultural development, mitigate the adverse effects of climate change, and ensure long-term food security in line with the United Nations Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger) and SDG 13 (Climate Action).

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1. INTRODUCTION

Food security has a direct impact on social well-being, health, and economic stability, making it a crucial component of sustainable development. Particularly in countries like Nigeria, the growing effects of climate change on agricultural production have resulted in acute food insecurity. Food production has been adversely impacted by increased droughts, floods, and rainfall unpredictability, endangering food affordability, accessibility, and availability. Resilient agricultural practices, laws, and policies are essential to addressing food insecurity, according to the Sustainable Development Goals (SDGs) of the United Nations, especially SDG 2 (Zero Hunger).[1]

Climate change-induced food insecurity in Nigeria presents a multidimensional challenge that directly undermines sustainable development. Socially, it intensifies hunger, malnutrition, and health vulnerabilities among already disadvantaged populations.[2] Economically, it disrupts agricultural productivity, rural livelihoods, and national food supply chains, thereby threatening economic stability and growth. Environmentally, unsustainable farming practices and climate-related shocks contribute to land degradation and biodiversity loss.[3] These interconnected impacts demonstrate that the selected theme, climate change and food insecurity cannot be addressed in isolation. It is fundamentally tied to the core of the Sustainable Development Goals

[1] United Nations, 'Transforming our World: The 2030 Agenda for Sustainable Development' (United Nations, 2015) <https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981> accessed 12 April 2025.

[2] Reuters, 'Millions of Nigerians go hungry as floods compound hardship' (13 November 2024), <https://www.reuters.com/world/africa/millions-nigerians-go-hungry-floods-compound-hardship-2024-11-13/> Accessed June 14, 2025.

[3] Luis Escalante and others, 'Economic and Food Security Impacts of Climate Disasters and Mitigation Policies: Insights from Nigeria' (2025) Environmental and Resource Economics 4, 3.2.1 <https://doi.org/10.1007/s10640-025-00981-3> Accessed June 14, 2025.

(SDGs), particularly SDGs 1,[4] 2,[5] 3,[6] 12,[7] and 13,[8] and must be understood within the broader context of building resilient systems that support long-term human and ecological well-being.

The Nigerian agricultural sector, on the other hand, has not followed the literal meaning of the adage 'you reap what you sow' since the advent of climate change, which has had worrisome repercussions for West Africa recently.[9] The saying has, however, come to represent the fate of people in their interactions with the environment when taken in a metaphorical sense. Over time, human activities have impacted the environment excessively, leading to the current climate change phenomenon, which has become a recurrent problem on a local, national, and worldwide level. This is in an ecosystem where food production is heavily dependent on human, technological, and natural factors, including but not limited to soil, water, rainfall, temperature, wind, and sunlight.[10] Greenhouse gases like carbon dioxide, methane, and nitrogen oxides, which are mostly released as a result of human activity causing global warming and climate change, have greatly concentrated the climate, which is seen as a common good but is also seen as a complex system connected to many of the conditions required for human life on a global scale.[11] This

[4] General Assembly resolution 70/1, *Transforming our World: the 2030 Agenda for Sustainable Development*, UNGA Res 70/1, A/RES/70/1 (25 September 2015) para 19

[5] Food and Agriculture Organization, *Zero Hunger: Turning Commitment into Action to Achieve SDG 2* (FAO 2017) <https://openknowledge.fao.org/items/31729d5b-8183-4c10-acf2-90168c6ea5b2> Accessed 14 June, 2025.

[6] World Health Organization, *World Health Statistics 2023: SDG 3 Targets Summary* (WHO 2023) <https://www.who.int/data/gho/data/themes/sustainable-development-goals/GHO/> accessed June 14, 2025

[7] United Nations in Nigeria, *Sustainable Development Goal 12: Responsible Consumption and Production* (UN 2025) s 12.3.

[8] United Nations in Nigeria, *Sustainable Development Goal 13: Climate Action* (UN 2025), accessed June 14, 2025.

[9] Peter Schmidt and Robert Muggah, *Climate Change and Security in West Africa* (Igarape Institute: Strategic Paper 52, 2021) 3https://copese.org/wp-content/uploads/2021/03/2021-02-04-AE-52-Climate-Change-and-Security-in-West-Africa.pdf > accessed 12 April 2025

[10] Paul Craig and Gráinne de Búrca, *EU Law: Text, Cases and Materials* (7th edn, OUP 2020) 112.

[11]Letter from Pope Francis to the People around the World (24 May 2015) <https://archive.org/details/vatican_pontiff-francesco_enciclica-laudato-si_2015> accessed 12 April 2025.

however, does not eliminate other factors that could lead to global warming such as volcanic activity, variations in the earth's orbit and the solar cycle.[12] Article 1(2) of the United Nations Framework Convention on Climate Change (UNFCCC)[13] describes climate change as a shift in climate patterns that is directly or indirectly caused by human activities, occurring. While this offers a working explanation, the concept of climate change remains broadly interpreted across international legal instruments. The absence of a single, universally accepted definition creates uncertainty in law and policy, especially when states interpret obligations differently. For a global issue with far-reaching consequences, a clear and cohesive definition is not just academic, it is necessary. This paper therefore calls for the adoption of a unified legal definition of climate change that can guide treaty interpretation, compliance standards, and domestic legislation across jurisdictions.

Regionally, the ECOWAS Regional Agricultural Resilience Program (RARP), launched in 2023, is one of the most comprehensive West African responses to the food-climate-development nexus. Designed to foster resilience to climate shocks, the RARP supports irrigation schemes, seed banks, climate-smart agriculture, and disaster preparedness across select member states, notably Burkina Faso, Mali, Niger, and Senegal, all of whom are grappling with extreme climate variability and political instability.[14]

Nigeria's exclusion from the initial implementation of RARP raises critical concerns, especially given the country's evident vulnerability to climate-induced food insecurity. With nearly 25 million Nigerians projected to face acute food insecurity in 2025 due to flooding, drought, and conflict in the North-East and Middle Belt regions,[15] the rationale for

[12] ibid.

[13] United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107, art 1(2).

[14] ECOWAS Commission, *Regional Agricultural Resilience Programme (RARP) Implementation Brief* (2023) https://ecowas.int/wp-content/uploads/2023/07/Regional-Agricultural-Resilience-Programme-RARP-Implementation-Brief.pdf accessed 21 April 2025.

[15] FAO and WFP, *Hunger Hotspots: FAO-WFP Early Warnings on Acute Food Insecurity – Outlook for March to July 2025* (2025) https://www.wfp.org/publications/hunger-hotspots-fao-wfp-early-warnings-acute-food-insecurity accessed 21 April 2025.

its exclusion appears inconsistent with the programme's objectives. Moreover, Nigeria has one of the highest rural populations in West Africa and is a regional leader in terms of agricultural output and political influence within ECOWAS. Its participation would not only enhance domestic food security but would likely amplify the programme's regional impact. Nigeria should, therefore, advocate for its inclusion in subsequent RARP phases, leveraging its ECOWAS membership and aligning national climate and agricultural strategies with ECOWAS protocols.

While Nigerians have traditionally relied on fossil fuels and petrochemical products to meet their energy, industrial, and agricultural needs, contributing to greenhouse gas emissions and global warming, recent developments signal a shift towards cleaner energy solutions. The Nigeria Energy Transition Plan (ETP)[16], launched in August 2022, outlines a comprehensive strategy to achieve net-zero emissions by 2060. Key components include increasing renewable energy capacity, promoting energy efficiency, and leveraging gas as a transition fuel. Additionally, the Climate Change Act 2021[17] mandates the establishment of a National Climate Change Action Plan and a five-year carbon budget, reinforcing the country's commitment to climate action. On the state level, the Fifth Alteration (No. 17) Act 2023[18] empowers state governments to establish independent electricity markets, promoting localized energy solutions. These initiatives reflect a growing recognition of the need for sustainable energy practices and a commitment to reducing Nigeria's carbon footprint[19] In addition to its detrimental effects on food production and agriculture generally, global warming has caused the instability and unpredictability of the shift in seasonal cycles, which results in an increased and intense change in rainfall pattern that causes powerful

[16] Federal Republic of Nigeria, *Energy Transition Plan* (2022) https://www.energytransition.gov.ng accessed 21 April 2025.
[17] ibid 1.
[18] Federal Republic of Nigeria, *Fifth Alteration (No. 17) Act 2023*, Official Gazette (2023).
[19] Norbert Edomah, 'The Governance of Energy Transition: Lessons from the Nigerian Electricity Sector' (2021) 11 Energy, Sustainability and Society 40, 1764 https://doi.org/10.1186/s13705-021-00317-1.
<https://www.researchgate.net/publication/322314491_Effect_of_climate_change_on_food_security_in_Nigeria> accessed 12 April 2025.

storms, floods, and elevated temperatures.[20] The far-reaching effect of climate change goes beyond its influence on food production and the change in rainfall yields to a long-term effect on food security as a result of the unavailability and inaccessibility of good food for man and animals. The World Health Organisation (WHO) defines food security as the availability, affordability, accessibility, and utilisation of staple food crops by a household, including the most impoverished.[21]

Since climate change and seasonal variations has aggravated food insecurity in areas currently vulnerable to hunger and mal-nutrition,[22] it has become important to contribute to the discuss in order to facilitate proactive policies that will help in mitigating the impact of climate change on food production and agriculture . The present legal frameworks controlling agriculture and climate change, such as the National Environmental (Agricultural Sector) Regulations 2009,[23] the Climate Change Act 2021,[24] and the National Agricultural Technology and Innovation Policy (NATIP) 2022–2027,[25] their deficiencies, and reform suggestions that support sustainable development goals were all examined in this article, along with the effects of climate change on Nigeria's food security. It also underscores Nigeria's food insecurity has been impacted by changes in crop production brought on by climate change, which has an impact on food availability, cost, accessibility, and nutrition.

The paper is divided into five parts. Part 1 deals with the introduction of the concept of climate change and its implication on food production and security in Nigeria as well as the scope of the study. Part II discusses the literature review with focus on climate change, food security and sustainable development. Part III examines the gaps in the legal framework on climate change and food security in Nigeria as well as

[20] Ignatius C. Enete, 'Impacts of Climate Change on Agricultural Production in Enugu State, Nigeria' (2014) 5(9) Journal of Earth Science & Climatic Change 234 <https://www.omicsonline.org/open-access/impacts-of-climate-change-on-agricultural-production-in-enugu-state-nigeria-2157-7617.1000234.pdf> accessed 12 April 2025.
[21] (n 8).
[22] ibid.
[23] ibid 2.
[24] ibid 1.
[25] ibid 3.

current laws and policies that have emerged since the rapid rise of climate change in Nigeria. Part IV analyses the law reform recommendations for addressing food insecurity and climate change. Part V contains the concludes this research.

Methodology

This article adopts a qualitative research approach, utilizing secondary data to critically analyze the relationship between climate change, food insecurity, and sustainable development in Nigeria. Rather than merely describing existing policies, the research provides an in-depth evaluation of the policies on climate change and food production, assessing their strengths, weaknesses, and practical implications for sustainable development. The study is both descriptive and exploratory, as it not only examines the nexus between climate change, food insecurity, and human development in Nigeria but also critiques the effectiveness and implementation of key policies in addressing these interconnected challenges. Drawing from both primary and secondary sources, including textbooks, journal publications, and online resources, this article offers a theoretical framework that highlights the gaps in current policy and suggests avenues for reform to promote more sustainable outcomes.

2. LITERATURE REVIEW

2.1 The Interconnection between Climate Change and Food Security

Climate change has a profound impact on food security, affecting agricultural output through extreme weather conditions. Studies indicate that rising temperatures, unpredictable precipitation, and increased greenhouse gas emissions reduce crop yields, increase food prices, and limit access to nutritious food.[26] The Food and Agricultural Organization

[26] FAO and others, 'The State of Food Security and Nutrition in the World' (World Health Organization, 6 July 2022) <https://www.who.int/publications/m/item/the-state-of-food-security-and-nutrition-in-the-world-2022> accessed 12 April 2025.

(FAO)[27] define food security as the availability, accessibility, affordability, and sustainability of nutritious food.

Climate change is rapidly affecting agriculture, and in a country like Nigeria, where poverty and hunger are closely tied to bad governance, convincing citizens of its impact is challenging. The unpredictable changes in rainfall patterns, leading to drought, heatwaves, and flooding, are significant contributors to hunger, poverty, and food insecurity in the country..[28]

According to Makonnen et al., one of the key determinants affecting the future food security of humans is the effect of climate change on agriculture. Rainfall, temperature, crops and cropping methods, soils, and management practices vary by region, a climatic situation may be beneficial in one area and detrimental in another, making the climate sensitivity of agriculture unknown.[29] These have made it difficult to understand seasonal changes in order to achieve better growth and harvest in the agricultural sector as a whole.[30]

Walid Sadok et al pointed out that many crops may experience decreased photosynthesis and increased evaporation of water from the earth's surface into the atmosphere during planting seasons where there is a notable increase in daytime temperature. This could result in a decrease in crop yield.[31] However, where warming occurs primarily at night, the negative impacts of climate change on crop productivity may be significantly reduced.[32] Although climate change has an impact on food production and agricultural areas, it should be highlighted that agriculture is not only vulnerable to climate change but also one of its main causes, as

[27] Food and Agriculture Organization and World Health Organization, *Second International Conference on Nutrition: Conference Outcome Document – Framework for Action* (FAO/WHO 2014) para 5 https://www.fao.org/3/ML542E/ML542E.pdf accessed 21 April 2025.
[28] ibid.
[29] (n9).
[30] ibid.
[31] Walid Sadok, Lopez, Kevin Smith, 'Transpiration Increases under High-Temperature Stress: Potential Mechanisms, Trade-offs and Prospects for Crop Resilience in a Warming World' (2021) 44 Plant, Cell & Environment 2306, 2306
[32] (n9) 2.

certain human agricultural practices have had a negative impact on the atmosphere and the environment as a whole.[33]

According to Sadie J Ryan and others , there is a continuous search for fertile soil and the constant deforestation by farmers causing drifting sands which bury young crops as a result of increased demands by the rising population.[34] According to the United Nations, Nigeria's population in 2024 is estimated at approximately 232.68 million, making it the sixth most populous country globally and the most populous in Africa.[35] A lot of Nigerians tend to interact with the environment through agriculture, with a high propensity to engage in over farming, bush burning, and other activities that increase the concentration of CO_2 emissions in the atmosphere, which quickly depletes fertile soils, fossil water, biodiversity, and many other non-renewable resources.[36]

Ben and Okon posits that the more people there are, the greater the impact on the atmosphere and its resources since every new person is a new mouth to feed, a new body to clothe and keep warm, a new consumer of resources and a new producer of waste.[37]

2.2 Sustainable Development Goals and Food Security

Healthy and well-nourished people are the primary focus of sustainable development; therefore, food security is essential for achieving

[33] (n7) 17.
[34] Sadie J Ryan and others, 'Population pressure and global markets drive a decade of forest cover change in Africa's Albertine Rift' (2014) arXiv 3, <https://doi.org/10.48550/arXiv.1409.7280> 3 accessed 13 June 2025.
[35] United Nations, *World Population Prospects: The 2024 Revision* (Department of Economic and Social Affairs, Population Division, 2024) <https://population.un.org/wpp/> accessed 21 April 2025.
[36] Rafiu T. Afolabi and others, 'Perceived Effect of Bush Burning on Agricultural Farmland in Oluyole Local Government, Ibadan, Oyo State, Nigeria' (2024) 28(11) Journal of Applied Sciences and Environmental Management 6<https://www.ajol.info/index.php/jasem/article/view/282473> accessed 21 April 2025.
[37] Victor E Ben and Daniel E Okon, 'Population, Environment and Planning for Sustainable Development in Nigeria' (2020) 10(1) Ibom Journal of Social Issues 57 https://ijsi.org.ng/index.php/home/article/view/12 accessed 12 April 2025.

the United Nations Sustainable Development Goals (SDGs).[38] Food security focuses on ensuring that people have consistent access to safe, nutritious, and sufficient food for a healthy life. The dimensions of food security include adequate food utilization, physical and economic access to food, and the physical availability of food.[39]

Food security in Nigeria is a pressing issue that directly impacts the achievement of Sustainable Development Goal 2 (SDG 2), which aims to end hunger and ensure access to safe, nutritious food. Various studies highlight the multifaceted challenges Nigeria faces, including insecurity, inadequate infrastructure, and inefficient agricultural practices. According to a 2023 study by Sani et al.,[40] food insecurity remains a critical issue in Nigeria, with nearly 25 million people facing food insecurity. The majority of respondents in the study carried out by Kolawole were in the lowest band of per capita total expenditure and sectoral expenditures. Food security and food insecurity indices were 1.26 and 0.53 respectively.[41] Addressing these challenges is crucial for enhancing food security and fulfilling SDG 2.

The UN Sustainable Development Goals (SDGs) advocate for policies that promote climate-resilient agriculture, efficient resource management, and reduction in food waste.[42] SDG 2 emphasizes sustainable food production systems, while SDG 13 calls for urgent action against climate change and its impacts. Nigeria is making efforts to improve food security, but the combination of socioeconomic issues and

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[38] Rashidat Dauda, 'Climate Change and Food Security in Nigeria' (2023) 21(2) Economic and Policy Review 18 <https://www.ajol.info/index.php/epr/article/view/261292> accessed 12 April 2025.

[39] ibid.

[40] Abubakar A Sani and others, 'Assessment of Farm Resources and Livelihood Strategies Adopted in Mitigating Crop Farmers' Food Insecurity During Insurgency in North-Eastern Nigeria' (2024) 22(2) Agro-Science *<https://www.ajol.info/index.php/as/article/view/271073>.*

[41] Clement O Kolawole, 'Consumption Expenditure Patterns and Food Security Dynamics in Nigeria' (2024) 4(3) International Journal of Advanced Multidisciplinary Research and Studies <https://www.multiresearchjournal.com/arclist/list-2024.4.3/id-2946> accessed 25 January 2025.

[42] UN Sustainable Development Goals Report, 2021 <https://digitallibrary.un.org/record/3932350?v=pdf> accessed 12 April 2025.

governance problems continues to impede the country's progress toward achieving Sustainable Development Goal 2 (SDG 2). Key challenges include widespread poverty and unemployment, which remain persistent barriers to food security. Over 40% of Nigerians live below the poverty line, according to the National Bureau of Statistics.[43] This economic hardship limits access to adequate food, particularly in rural areas where the population depends heavily on agriculture for their livelihood. High unemployment further exacerbates the situation, reducing purchasing power and making it difficult for many to afford nutritious food.

In addition to economic challenges, insecurity and armed conflict have significantly disrupted agricultural activities, particularly in the North-East. Insurgency and farmer-herder clashes have caused widespread displacement and destruction of farmland,[44] increasing food insecurity. A study by Otekunrin et al.[45] points out that these security issues directly impact local food production, as well as the importation of essential food items, leaving the population vulnerable to food shortages and inflated prices.

Climate change further compounds the problem by disrupting the agricultural sector through unpredictable weather patterns, including prolonged droughts and excessive flooding. These environmental changes adversely affect crop yields, particularly for staples like maize, millet, and rice. As Sambo and Sule puts it,[46] the impacts of climate change are particularly severe in northern Nigeria, where droughts have led to decreased agricultural productivity, contributing to food insecurity.

Inadequate infrastructure remains a significant challenge. Poor roads, inadequate electricity, and insufficient storage facilities hinder food production and distribution, leading to high post-harvest losses. This not

[43] National Bureau of Statistics (2023) – National Poverty Headcount Index (National Bureau of Statistics, 2023) <https://www.nigerianstat.gov.ng> accessed 21 April 2025.
[44] Olutosin Ademola Otekunrin, Ngozi Chinonso Eze, and Temitope Kolawole, 'Investigating and Quantifying Food Insecurity in Nigeria: A Systematic Review' (2023) 13(10) Agriculture 1873 <https://doi.org/10.3390/agriculture13101873> accessed June 14, 2025
[45] ibid 41.
[46] Usman Sambo and Babayo Sule, 'Impact of Climate Change on Food Security in Northern Nigeria' (2023) 2(1) Green and Low-Carbon Economy 49.

only increases food prices but also prevents farmers from reaching markets in a timely manner, thereby exacerbating food insecurity for vulnerable communities.

To overcome these obstacles, a comprehensive strategy incorporating sustainable practices and community involvement is essential.

2.2.1 Concept and Measurement of Food Security in Nigeria

Food security is a multidimensional concept, often understood in terms of food availability, access, utilisation, and stability. Over time, the way food security is conceptualised and measured has evolved. Traditionally, emphasis was placed on national food supply and availability. However, more recent perspectives show that access, particularly the purchasing power of the poor is a more accurate measure of food insecurity. As noted by **Robert Benassai-Dalmau and others**, the measurement of food security should increasingly focus on the economic capacity of vulnerable populations to afford food, even when food is available in the market.[47] This view aligns with current realities in Nigeria, where disparities in income and inflation often prevent households from accessing food despite surplus in some regions.

A critical development in recent years is the adoption of the National Agricultural Technology and Innovation Policy (NATIP) 2023–2027,[48] which seeks to enhance agricultural productivity through technological innovation. The policy identifies food insecurity as a national emergency and targets improvements in yield through mechanised farming, climate-resilient seeds, digital extension services, and investment in smart irrigation systems.[49] By shifting from subsistence to technology-driven agriculture, NATIP aims to improve food access and supply chains across

[47] **Robert Benassai-Dalmau and others**, 'Unequal Journeys to Food Markets: Continental-Scale Evidence from Open Data in Africa' (2025) arXiv 3
[48] ibid.
[49] Federal Ministry of Agriculture and Rural Development, *National Agricultural Technology and Innovation Policy (NATIP) 2023–2027* (FMARD, Abuja 2023) <https://fmard.gov.ng/natip> accessed 21 April 2025.

rural and urban areas. The policy's structure offers a framework for aligning innovation with food security objectives and provides measurable indicators for evaluating agricultural performance.

Incorporating NATIP into Nigeria's food security discourse highlights the growing recognition that agricultural innovation is not a luxury but a necessity in addressing hunger and undernourishment. When supported by adequate funding and good governance, the policy has the potential to transform food production, improve farmer resilience, and reduce regional food disparities.

Makombe posited that food security has become a global priority, followed by food production before all other concerns, especially in context of the 2008 food crisis..[50] Food security involves food accessibility, availability, and sustainable use such that people can be said to be food secured when they are able to access adequate and nutritious food at all times.[51] He opined that although, majority of the food in-secured are domiciled in developing countries, food security has become an issue of top priority for both developing and developed countries.[52] According to the 1996 World Food Summit , food security can only be achieved 'when at all times, human beings have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs for an active and healthy life'.[53]

Over the years, the definition and concept of food security have evolved, along with the indicators used to measure it. According to Robert Benassai-Dalmau and others, food security is primarily measured by the purchasing power of the poor, rather than the management of domestic

[50] Godfrey Makombe, 'The Food Security Concept: Definition, Conceptual Frameworks, Measurement and Operationalisation' (2023) 48(4) Africa Development 58 <https://www.jstor.org/stable/48778842> accessed 12 April 2025.
[51] ibid, 60.
[52] FAO and others, 'The State of Food Security and Nutrition in the World 2023: Urbanization, Agrifood Systems Transformation and Healthy Diet across the Rural-Urban Continuum' (FAO Rome, 2023) <https://doi.org/10.4060/cc3017en> accessed 12 April 2025.
[53] Ioannis Manikas, Bilal M Ali and Balaji Sundarakani, 'A Systematic Literature Review of Indicators Measuring Food Security' (2023) 12(1) Agriculture & Food Security 13 <https://doi.org/10.1186/s40066-023-00415-7> accessed 12 April 2025.

supply.[54] While food may be available in some parts of Nigeria, its supply can be disrupted in other regions, leading to significant imbalances. For instance, the **North-East** and **North-West** states, which are particularly affected by insurgency, face decreased agricultural production due to insecurity and displacement.[55] This results in reduced food availability, driving up prices and causing poverty and hunger, especially for small-scale farmers who often cannot afford to buy the food they produce, nor are they able to feed themselves and their families. Similarly, the **South-East** and **South-South** regions have experienced flooding and environmental degradation, which also disrupt food production, contributing to the vulnerability of local farmers.[56]. However, the Food and Agricultural Organization (FAO) has provided an inclusive definition which states:[57]

> *Food security, at the individual, household, national, regional and global levels is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.*[58]

Furthermore, Mojeed's[59] statistics reveal that half of Nigerians now live below the poverty line of 1.9 USD. According to him, the World

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[54] (n 46).

[55] Isah Abubakar Idris and Sanusi Abdulwasiu, 'The Impact of Insecurity on Food Security Among Rural Households in Sokoto East Senatorial District of Sokoto State, Nigeria' (2023) 2(2) Journal of Human, Social and Political Science Research 119 <https://ssaapublications.com/index.php/sjhspsr/article/view/113> accessed 12 April 2025.

[56] Gideon O Atedhor and Paul AO Odjugo, 'Perspectives of Climate Change-induced Agricultural Losses and Food Shortage in the Swamp Forests of the Niger Delta Region, Nigeria' (2022) 6(2) Nigerian Journal of Environmental Sciences and Technology 493 <https://doi.org/10.36263/nijest.2022.02.0372> accessed 12 April 2025.

[57] (n 23) 56.

[58] ibid.

[59] Abdulkareem Mojeed, 'Experts Discuss Innovative Ways to Achieve Food Security in Nigeria' Premium Times (Abuja, 25 October 2024) <https://www.premiumtimesng.com/news/729005-experts-discuss-roles-of-mobile-

Bank's September 2024 food security report ranked Nigeria as the third most affected country in Africa and the fifth most affected globally by food inflation, behind Malawi and Liberia. This places Nigeria 110th out of 127 countries in the 2024 Global Hunger Index (GHI). Adedokun also emphasized the importance of food security as it is outlined in the Sustainable Development Goals (SDGs), which are intended to help poorer nations that rely largely on rain-fed agriculture, which appears to expose the areas to environmental risks like droughts, desertification, erosion, and numerous other climatic issues that can significantly reduce crop yields. It is safe to say, then, that the components and dimensions of availability, accessibility, and utility dictate how food security is measured.[60]

There has also been the inclusion of sustainability as a dimension to food security especially since the emergence of the Sustainable Development Goals, precisely SDG 2 which calls for more sustainable, healthier and more equitable food systems. According to Adedokun, Sustainability refers to food system practices that achieve the long-term regeneration of social, natural and economic systems while meeting the food needs of current the generation without being detrimental to the food needs of future generations.[61] Ajayi pointed out that both federal and state governments have made effort to launch several agricultural initiatives to ensure food security and boost the economy of the country.[62]

technology-media-in-achieving-climate-resilient-agriculture-in-nigeria.html?tztc=1> accessed 13 January 2025.

[60] Blessing Abeyuwa Adedokun, 'Nigeria's Food Insecurity and Its Implications on Sustainable Development Goal (SDG) 2 Amidst the COVID-19 Era' (2021) 6(5) Journal of Good Governance and Sustainable Development in Africa 22 <https://sdbindex.com/documents/00000431/00001-38450.pdf> accessed 12 April 2025.

[61] ibid.

[62] Omeiza Ajayi, 'Food Security: FG Launches Agric Project in Bayelsa' Vanguard (Bayelsa, 25 August 2024) <https://www.vanguardngr.com/2024/08/food-security-fg-launches-agric-project-in-bayelsa/#:~:text=By%20Omeiza%20Ajayi,across%20the%20South%2DSouth%20region > accessed 26 August 2024.

2.2.2 Impact of Climate Change on Food Security in Nigeria

One of the major environmental issue in Nigeria is climate change and this has led to starvation, hunger and poverty in the land. Human activities has negative impacts on global climate systems, which has led to global warming and rise in temperature. Kehinde and Abifarin warned that, one of the most significant effects of these rising temperatures are those that is felt in the agricultural sector where plants are only able to grow best at specific temperatures and when those temperatures change, their productivity changes significantly. These effects are however felt differently in the largely temperate developed countries and in the more tropical developing countries.[63] Changes in temperature and rainfall that are regarded as insignificant have significant effects on the quality and security of fruits, vegetables, tea, coffee, plants for medicine and basmati rice as well as other impacts on the agricultural sector which includes lessened yields from dairy cattle and a decline in breeding, migration, and harvests of fish such that statistics reports have indicated a loss with an estimate 10-40% in crop production by 2100, causing food insecurity in the country.[64]

2.3 Climate Change and Agricultural Productivity in Nigeria

In Nigeria, the National Climate Change Policy and Response Strategy (NCCPRS) and the Agricultural Promotion Policy (APP) provide guidelines for managing climate change impacts on agriculture.[65] However, existing policies have not been effectively implemented due to regulatory weaknesses, financial constraints, and lack of enforcement mechanisms.

[63] Adeola Olufunke Kehinde and Olufemi Abifarin, 'Legal Framework for Combating Climate Change in Nigeria' (2022) 9(3) Kutafin Law Review 395 <https://doi.org/10.17803/2713-0525.2022.3.21.395> accessed 16 July 2024.
[64] ibid.
[65] ibid.

2.3.1 Examination of the National Climate Change Policy and Response Strategy (NCCPRS) and Agricultural Promotion Policy (APP)

The National Climate Change Policy and Response Strategy (NCCPRS)

The National Climate Change Policy and Response Strategy (NCCPRS), launched in 2012, represents a major policy commitment by the Federal Government of Nigeria to tackle the complex threats posed by climate change across various sectors. The policy aims to foster a low-carbon and climate-resilient economy, aligning with national development goals and international commitments such as the Paris Agreement.[66] It emphasises a sectoral approach, focusing on agriculture, water resources, energy, and health as key areas of vulnerability.[67]

A critical feature of the NCCPRS is its call for the mainstreaming of climate considerations into national planning, budgeting, and policymaking. In relation to agriculture, it advocates for the adoption of climate-smart practices, sustainable land management, and investment in early warning systems.[68] More recently, the passage of the Climate Change Act 2021, which seeks to operationalise elements of the NCCPRS, has offered renewed legal backing for climate governance. The Act mandates the creation of a National Council on Climate Change and institutionalises carbon budgeting and mitigation strategies, creating a legal bridge between policy and enforcement.[69] Nonetheless, synergy between this legislation and sector-specific frameworks like the NCCPRS remains insufficient.

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[66] ibid.

[67] Queen Mary University of London Global Policy Institute, *Nigeria's Climate Change Response: Institutional Architecture and Sectoral Dynamics* (2023) <https://www.qmul.ac.uk/gpi/media/images/QMGPI-Nigeria%27s-Climate-Change-Response-FINAL.pdf> Accessed 21 April, 2025.

[68] Adedeji O Olamide, 'Mainstreaming Climate Change into National Policy Frameworks: A Case Study of Nigeria's NCCPRS' (2021) 8(2) International Journal of Climate Change and Development 45 https://doi.org/10.1080/23262872.2021.1877765.

[69] Climate Change Act 2021 (Nigeria), Act No. 32 of 2021, ss 3, 4, 5 and 20.

The Agricultural Promotion Policy (APP) 2016–2020

Introduced by the Federal Ministry of Agriculture and Rural Development, the Agricultural Promotion Policy (APP), popularly referred to as "The Green Alternative" was developed as a follow-up to the Agricultural Transformation Agenda (ATA) and spanned from 2016 to 2020. It aimed to improve Nigeria's self-sufficiency in food production by supporting smallholder farmers, reducing post-harvest losses, and improving access to finance and market infrastructure.

A central ambition of the APP is to reduce Nigeria's dependency on food imports, particularly rice, wheat, fish, and dairy, and instead focus on value chain development and agro-industrialisation. It also indirectly acknowledges climate vulnerabilities by encouraging innovation in irrigation, drought-resistant crops, and sustainable farming techniques.[70] The cornerstone to a nation's development is agriculture, which has the potential to be an industrial and economic stimulus.[71] According to Adamu, more than 60% of the population in Africa depends on agriculture for their livelihood, and the sector contributes about 30% of Gross Domestic Product (GDP). It continues to be the main source of income for rural communities, especially in developing nations, and it makes a substantial contribution to employment and GDP.[72]

Approximately 97% of all cropland in Sub-Saharan Africa is used for rain-fed farming, which puts agricultural output at risk from significant seasonal rainfall variability.[73] In Nigeria, for example, 60–70%

[70] Eniola O Akinyemi, 'Evaluating Nigeria's Agricultural Promotion Policy: A Focus on Value Chain Development and Climate Resilience' (2020) 14(3) International Journal of Agricultural Economics and Rural Development 56 <https://doi.org/10.1016/j.ijagr.2020.01.004> accessed June 13, 2025.

[71] Victor Osai Azubuike, Uche C C Nwogugwu and Ebele Nwokoye, 'The Role of Agriculture in Economic Development: in Nigeria' (2023) 3 Journal of International Economic Relations and Development Economics 103, 107 <https://www.theinterscholar.org/journals/index.php/jierade/article/view/208> accessed 13 June 2025.

[72] Aron Jane Adamu, 'Climate Change Implications for Agricultural Productivity: A Comprehensive Analysis' (2024) 13(1) INOSR Experimental Sciences 66-71 <http://dx.doi.org/10.59298/INOSRES/2024/1.66.7110> accessed 12 April 2025.

[73] ibid.

of the population depends mostly on agriculture for both employment and food.[74] Beyond providing for livelihoods, Nigeria's agriculture makes a substantial economic contribution by producing foreign exchange revenues and providing raw materials for processing companies.[75] Nigeria's agriculture is primarily rain-fed, so any changes to the country's climate patterns could have an effect on productivity and, in turn, other socioeconomic activities. The rise in sea level, crop growth, availability of soil and water, soil erosion, pest and disease incidences, and a decline in soil fertility are all indicators of how climate change is affecting agriculture.[76] Therefore, for sustainable growth and the general welfare of the populace, it is imperative to comprehend and address the effects of climate change on Nigerian agriculture.

The threat of climate change not only seriously jeopardises the long-term viability of agricultural and socioeconomic development in countries, but it also threatens the basic foundation of human life.[77] According to the United Nations Framework Convention on Climate Change (UNFCCC), the effects of climate change are characterised by a swift change in local climate variability that exceeds people's ability to adapt over time. Climate change poses a threat to agricultural productivity that goes beyond crop production to include livestock and the agricultural industry as a whole. African farmers rely heavily on livestock as a source of food, cash, and other animal products.

Climate change can exert both direct and indirect effects on livestock.[78] Climate variables including air temperature, humidity, wind speed, and others have direct effects on important facets of animal

[74] ibid.
[75] Olufemi Boyede, 'Agriculture as Nigeria's New Forex Goldmine: Balancing Local Needs and Global Market Opportunities' Premium Times Nigeria (11 February 2025) <https://www.premiumtimesng.com/business/trade-insights/773608-agriculture-as-nigerias-new-forex-goldmine-balancing-local-needs-and-global-market-opportunities.html> accessed 13 June 2025.
[76] Olusegun Samuel Balogun, Oluwaseyi Chijioke Nwahia, and Emmanuel Nwebor, 'Climate-Smart Agriculture for Sustainable Agricultural Development in Nigeria: An Empirical Review' (2024) 28(6) Journal of Applied Sciences and Environmental Management 1853-1858<https://doi.org/10.4314/jasem.v28i6.26> accessed 12 April 2025.
[77] ibid.
[78] ibid.

performance, such as growth, milk and wool production, and reproduction. Climate change can also affect the distribution and severity of livestock illnesses and parasites, as well as the amount and quality of feed supplies including pasture, forage, and grains.[79] Rainfall is therefore the most important factor in Nigeria's climate change and water resources potential, and a detailed analysis of agricultural productivity is part of the comprehensive evaluation of the agricultural sector.[80] An annual decrease in surface water, the loss of terrestrial plant and animal resources, and a growing transition to an arid environment are all signs of the northeastern region's rapid desertification,[81] deforestation and the growth of sand dunes and along the northern axis are caused by humans exploiting formerly undeveloped territories due to the ongoing decrease in rainfall, which also lowers the natural regeneration rate of land resources.[82]

Considering the world's most urgent issues, scholars have argued that climate change is more urgent than the threat of international terrorism.[83] In the traditionally high-rainfall southern areas of Nigeria, irregularities in rainfall patterns are being experienced, coupled with a gradual rise in temperatures in the Guinea savannah zone. Simultaneously, the northern zone contends with the menace of desert encroachment.[84]

Climate change has an impact on food and water supplies, which are vital for livelihoods in Africa, where a large section of the population, particularly the poor, depends on supply networks that are sensitive to local conditions. The difficulties already presented by climate change in

[79]Alsaied Alnaimy Habeeb and others, 'The Detrimental Impact of High Environmental Temperature on Physiological Response, Growth, Milk Production, and Reproductive Efficiency of Ruminants' (2023) 55 Tropical Animal Health and Production 388 <https://doi.org/10.1007/s11250-023-03805-y> Accessed 13 June 2025.

[80] Fakhurl Wahab, and others, 'The Impact of Climate Change on Agricultural Productivity and Agricultural Loan Recovery; Evidence from a Developing Economy' (2024) 26 Environment, Development and Sustainability 24777 <https://link.springer.com/article/10.1007/s10668-023-03652-9> accessed 12 April 2025.

[81] ibid.

[82] ibid.

[83] Aron Jane Adamu, 'Climate Change Implications for Agricultural Productivity: A Comprehensive Analysis' (2024) 13(1) INOSR Experimental Sciences 66 <http://dx.doi.org/10.59298/INOSRES/2024/1.66.7110> accessed 12 April 2025.

[84]ibid.

eradicating poverty are made worse by disruptions to the current food and water systems, which have serious repercussions for livelihoods and development.[85] Obioha opined that the suitability of the climate, which is changing constantly, is crucial for the sustainability of the environment, which provides life support systems and materials for achieving developmental goals.[86] The effects of these changes represent a substantial threat to food security.

2.3.2 Climate Change, Food Security and Sustainable Human Development in Nigeria

A thorough examination of Nigeria's development policies and ideology is necessary to make significant strides in food production. It is ideology that gives people the psychological ability to discuss, assess, and suggest ideas to their surroundings, to their government, and to each other.[87] On the other hand, development is about improving people's living conditions both qualitatively and quantitatively. It can be said that ideology and development have a dialectical relationship because ideology organises people both actively and perceptively around what needs to be changed or developed.[88] In this regard, it is agriculture and food production.

Adebayo and Abubakar opined that the present development paradigm of the Nigerian government is not geared towards self-sufficiency and self- reliant. It is orientated towards the metropolitan, which acts as its model of development.[89] However, since the 1970s and

[85] Dinko Hanaan Dinko and Ibrahim Bahati, 'A Review of the Impact of Climate Change on Water Security and Livelihoods in Semiarid Africa: Cases from Kenya, Malawi, and Ghana' (2023) Journal of Climate Resilience and Climate Justice 107, 111 <https://doi.org/10.1162/crcj_a_00002> accessed 13 June 2025.

[86] Daniel J Lawrence and others, 'Spatial Changes to Climatic Suitability and Availability of Agropastoral Farming Systems Across Kenya (1980–2020)' (2023) Journal of Eastern African Studies (advance publication) 6 <https://doi.org/10.1177/00307270231176577> accessed 13 June 2025.

[87] Riccardo Canova, Aini Azaeqa Ma'rof and Zatul Himmah Adnan, 'The Psychological Foundations of Ideology: Developing an Integrative Theoretical Framework' (Preprint, October 2024) 9.

[88] ibid.

[89] Abdullahi Adebayo Adebayo and Sulaimon Yekini Abubakar, 'Assessment of Climate Change in the Savannah Sugar Project Area, Adamawa State, Nigeria' (15th International

the 1980s, this has proved to be a failure.[90] A shift towards a socialist framework of development or, better yet, welfarism is required in order to move the government's focus to the welfare and well-being of the populace and effectively give them control over the government. In this way, some of the problems of food insecurity, provision of social amenities and so on can be managed effectively.

Farmers are disadvantaged by the current land use system, which denies land to those who wish to farm. The Land Use Act[91] is in need of reform to enhance equitable land access for both adult males and females. Currently, the Act places land administration under the control of state governors, with land rights granted primarily through land tenure systems that often marginalize women. Specifically, Section 1[92] vests all land in a state in the governor, who holds land for the use and benefit of the citizens. However, the Act does not adequately address equal access for both genders, often hindering women's ability to freely cultivate land. Moreover, Section 22[93] grants the governor significant power over land allocations, which can perpetuate male-dominated land ownership structures and contribute to gender inequality in land access. As such, a comprehensive review is needed to make land more accessible for all adult Nigerians, irrespective of gender, enabling both men and women to cultivate land and pursue agricultural livelihoods more effectively.

Historically, the Nigerian government has supported the agricultural sector financially through a number of loan and aid initiatives. Insufficient control has frequently resulted in the misallocation of these

Academic Conference, Rome, International Institute of Social and Economic Sciences (IISES), 14 April 2015) 19–28 <https://www.iises.net/proceedings/international-academic-conference-rome/front-page> accessed 14 January 2025.

[90] Chinyeaka Justine Igbokwe-Ibeto, Ifeoma Lilian Nnaji, and Adaobi Amelia Mac-Ozigbo, 'Open Grazing, Food Insecurity and Sustainable Human Development in Nigeria: A Horn of Dilemma' (2021) 7(1) KIU Journal of Social Sciences 63 <https://www.researchgate.net/publication/358901346_Open_Grazing_Food_Insecurity_and_Sustainable_Human_Development_in_Nigeria_A_Horn_of_Dilemma> accessed 12 April 2025.

[91] Land Use Act 1978 (Nigeria), Act No. 6 of 1978, ss 1, 22.

[92] Land Use Act 1978 (Nigeria), Act No. 6 of 1978, s 1.

[93] Land Use Act 1978 (Nigeria), Act No. 6 of 1978, s 22.

funds, with political and bureaucratic players taking funds meant for actual farmers and spending them elsewhere.[94]

Beyond government support, the private sector has a crucial role to play in advancing agricultural development. Private sector investments can bring about innovation, technology transfer, and market access to agricultural value chains, ensuring long-term food security. By investing in infrastructure, agro-processing, and supply chains, private entities can help reduce post-harvest losses and increase productivity. The private sector also plays a key role in agro-industrialisation and the development of climate-smart agriculture, which is vital to tackling Nigeria's agricultural challenges in the face of climate change.

In the same vein, The Nigerian government has allocated N826.5 billion to the agricultural sector in the 2025 national budget, a significant increase from the N362.94 billion allocated in 2024 and **N**228.4 billion in 2023.[95] However, this amount still represents only approximately 2% of the total national budget, which stands at **N**49.7 trillion. While this increase is commendable, that this allocation falls short of the Maputo Declaration of 2003,[96] which recommends that African nations allocate at least 10% of their national budgets to agriculture in order to ensure food security and stimulate rural development. In comparison, other African nations have allocated higher percentages of their national budgets to agriculture. For example, Egypt allocated approximately $3.79 billion to agriculture in 2024, significantly more than Nigeria's 2025 allocation.[97]

While the increased budget is a positive step, it remains insufficient to address the broad range of challenges Nigeria faces in achieving food

[94]**Dirisu Yakubu**, 'Reps Probe N2tn Anchor Borrowers Scheme' (Punch, 21 March 2025), <https://punchng.com/reps-probe-n2tn-anchor-borrowers-scheme/?utm> accessed 13 June 2025.

[95] **Farming Farmers Farms** 'Nigeria's Agricultural Budget in 2024 and 2025: A Critical Analysis' (2024) https://www.farmingfarmers.com/agriculture-budget-analysis-2024-2025 accessed 21 April 2025.

[96] ibid.

[97] **Tribune Online NG** 'How Nigeria's Agricultural Budget Stacks Up Against Other African Nations' (2024) <https://www.tribuneonlineng.com/nigeria-agriculture-budget-comparison> accessed 21 April 2025.

security and supporting its agricultural sector. The 2% allocation is far from the 10% recommended by the Maputo Declaration, and Nigeria must significantly increase investment in agriculture to meet its food security goals and address rural development challenges effectively.

The federal government launched the Agriculture Transformation Agenda (ATA) in 2011 in response to the agriculture sector's deteriorating performance. This strategy sought to improve openness in the distribution of agricultural supplies via a voucher-based approach, made possible by an electronic distribution system called e-Wallet.[98] The initiative significantly improved agricultural productivity, increased farmers' incomes, and contributed to poverty reduction. However, despite its successes, the subsequent administration abandoned the programme, highlighting the challenge of policy continuity in Nigeria. Scholars argue that for agricultural policies to be effective, they must be sustained across different administrations and directly benefit smallholder farmers, who are the backbone of food production.[99]

Studies indicate that access to flexible and low-interest agricultural loans from banks, insurance companies, and microfinance institutions can significantly enhance food production.[100] Additionally, the persistent rural-urban migration trend poses a serious threat to rural agricultural activities.

Despite past governmental efforts, rural development initiatives have had limited impact due to poor implementation and inadequate evaluation mechanisms. Many rural communities still lack essential social infrastructure such as schools, healthcare services, potable water, and road networks. Addressing these deficiencies requires a strategic and sustained approach to ensure equitable development across all regions. Scholars emphasize the need for government intervention in providing basic social

[98] ibid.
[99] ibid.
[100] **The Associated Press,** 'Floods kill at least 111 as northern Nigeria battles climate change, dry spells and heavy rainfall' (AP News, 30 May 2025) <https://apnews.com/article/69dcc0b8c06a052e83643edb20838db6> accessed 13 June 2025.

amenities, particularly in underserved rural areas, to support agricultural communities and improve overall living conditions.[101]

Climate change further exacerbates the challenges facing agriculture in Nigeria. Rising temperatures, unpredictable rainfall patterns, and environmental degradation negatively affect both food production and human well-being. Effective climate change mitigation strategies are necessary to ensure sustainable agricultural development.[102] However, climate change management should not be left solely to the government. Individuals must also adopt environmentally friendly practices, such as reducing deforestation, curbing bush burning, and promoting sustainable energy use.

The lack of stringent environmental regulations has also contributed to the degradation of natural resources, further threatening agricultural productivity. Poor enforcement of environmental policies has led to unregulated industrial activities that exacerbate ecological damage. Chinedum argued that Environmental Impact Assessments (EIAs) should be strictly enforced at all stages of industrial operations to mitigate the negative effects of industrialization on the environment.[103]

Unfortunately, the weak legal framework for environmental management has resulted in severe consequences for communities affected by industrial pollution. Compensation for affected populations is often inconsistent, allowing bureaucratic and political elites to exploit and mismanage funds meant for remediation efforts.[104]

In conclusion, while Nigeria has made significant efforts to enhance agricultural productivity and rural development, challenges such as policy

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[101] ibid.

[102] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2022: Impacts, Adaptation and Vulnerability* (Working Group II Contribution to Sixth Assessment Report, Cambridge University Press 2022) 888.

[103]Chinedum Uwaegbulam, 'Why Environmental Impact Reports Are Failing Stress Tests' The Guardian Nigeria (21 August 2024) <https://guardian.ng/news/why-environmental-impact-reports-are-failing-stress-tests/> accessed June 13, 2025.

[104] Synda Obaji, 'Environmental Impact Assessments Don't Work in Nigeria: Here's Why' The Conversation (5 September 2024) <https://theconversation.com/environmental-impact-assessments-dont-work-in-nigeria-heres-why-188796> accessed June 13, 2025

discontinuity, limited financial accessibility, environmental degradation, and weak regulatory frameworks continue to hinder progress. Addressing these issues requires a holistic approach that integrates sustained policy implementation, improved financial inclusion for farmers, rural infrastructure development, and effective environmental governance.

3. GAPS IN EXISTING LAWS AND POLICIES WITH RESPECT TO INTEGRATING SUSTAINABILITY

Despite the presence of regulatory agencies such as the Nigerian Meteorological Agency (NiMet) and the National Environmental Standards and Regulations Enforcement Agency (NESREA), significant gaps remain within Nigeria's legal framework for environmental and agricultural governance. One of the most pressing issues is the weak enforcement of existing environmental protection laws. This has resulted in the unchecked continuation of harmful practices such as deforestation, land degradation, and water pollution, all of which severely undermine agricultural productivity.

Furthermore, Nigeria's agricultural policies do not adequately integrate climate-smart strategies. While some frameworks exist, they fall short of addressing the need for adaptation to extreme weather events, thereby exposing farmers, particularly those in vulnerable regions to greater risks.

The legal landscape also neglects the needs of smallholder farmers, who constitute the majority of agricultural producers in the country. These farmers encounter significant legal and financial obstacles in accessing modern technology, agricultural credit, and climate-resilient farming methods, thereby limiting their capacity to adapt and thrive under changing climatic conditions.

Additionally, there is an absence of comprehensive legal instruments for sustainable land use and water resource management. Without such frameworks, the long-term resilience of Nigeria's agricultural systems in the face of climate change cannot be guaranteed.

Lastly, the country lacks an adequate legal structure for disaster risk reduction. There are no robust laws that enforce the implementation of early warning systems, flood control infrastructure, or emergency food reserves. This deficiency increases the nation's vulnerability to food insecurity during climate-induced disasters, leaving communities unprotected and underprepared.

4. LEGAL APPROACHES FOR ADDRESSING THE CHALLENGES: RECOMMENDATIONS

To align Nigeria's legal framework with sustainable development principles and enhance food security, it is recommended that the **Environmental Protection Laws** be strengthened. The enforcement of laws on deforestation, land degradation, and pollution must be prioritized to protect agricultural ecosystems. The Federal Environmental Protection Agency (FEPA) Act should be updated to include strict penalties for environmental violations.

In the same vein, Environmental Governance through enforcement mechanisms must also be promoted. For instance, The NESREA Act (Amendment) Bill seeks to reinforce the enforcement capabilities of NESREA by expanding its powers to impose stiffer penalties and enhance regulatory oversight, especially in agricultural and industrial sectors. A key recommendation would be to expedite the enactment of this Bill, and specifically ensure the inclusion of agricultural environmental compliance protocols, particularly in relation to land degradation, irrigation practices, and agrochemical use. This will directly support sustainable land management and reduce environmental factors that undermine food security.[105]

Similarly, climate and food security risk assessment in environmental impact assessments must be mandated. The Environmental Impact Assessment (EIA) Bill 2023 introduces a broader scope for impact

[105] National Assembly of Nigeria, *National Environmental Standards and Regulations Enforcement Agency (Amendment) Bill, 2023*, HB. 1724, Second Reading Passed 2024.

analysis, including mandatory climate change and food security risk assessments for all large-scale agricultural and infrastructural projects. This reform is crucial, as it allows early identification of potential threats to food systems and biodiversity. It is recommended that the EIA framework be revised to make climate-food nexus assessments a statutory requirement, especially for agro-industrial zones, commercial farming ventures, and rural land conversion projects.[106]

While at it, the government should integrate climate adaptation strategies such as drought-resistant crops, efficient irrigation systems, and precision farming into existing agricultural policies.

Additionally, legal support for smallholder farmer should be made available. Policies should provide subsidies, credit facilities, and training programs to help smallholder farmers adopt sustainable farming practices.[107] A national framework for sustainable land use should also be developed to regulate deforestation, soil erosion, and water resource allocation.[108]

Conclusively, Tax incentives and public-private partnerships should be highly encouraged to drive investments in sustainable agricultural technologies and renewable energy sources.

5. CONCLUSION

Food security and climate change are critical components of sustainable development in Nigeria. While existing legal frameworks address certain aspects of these issues, significant gaps remain in enforcement, smallholder farmer protection, and climate adaptation strategies. Strengthening Nigeria's legal and policy framework through targeted reforms will enhance resilience in the agricultural sector and promote sustainable food systems.

[106] Federal Ministry of Environment, *Environmental Impact Assessment Bill 2023*, Executive Bill presented to the National Assembly, Gazetted February 2023.
[107] Nigerian Smallholder Farmer Policy, 2018.
[108] Land Use Act, 1978.

Legal mechanisms must be aligned with international best practices to ensure Nigeria meets its Sustainable Development Goals, particularly SDG 2 (Zero Hunger) and SDG 13 (Climate Action). Effective legal reforms will not only mitigate the impact of climate change on food security but also foster a sustainable and resilient agricultural sector in Nigeria.