POST-2010 CLIMATE CHANGE ADAPTATION POLICIES FOR THE AGRICULTURAL SECTOR OF NIGERIA

Nigeria

On behalf of:

Federal Ministry
for the Environment, Climate Action,
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Address
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
Köthener Str. 2
10963, Berlin, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de/en

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Project manager
Anita Richter
anita.richter@giz.de

Author
Dr. Chukwuemeka Emenekwe, Abakaliki

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Alvira Yertayeva, Astana

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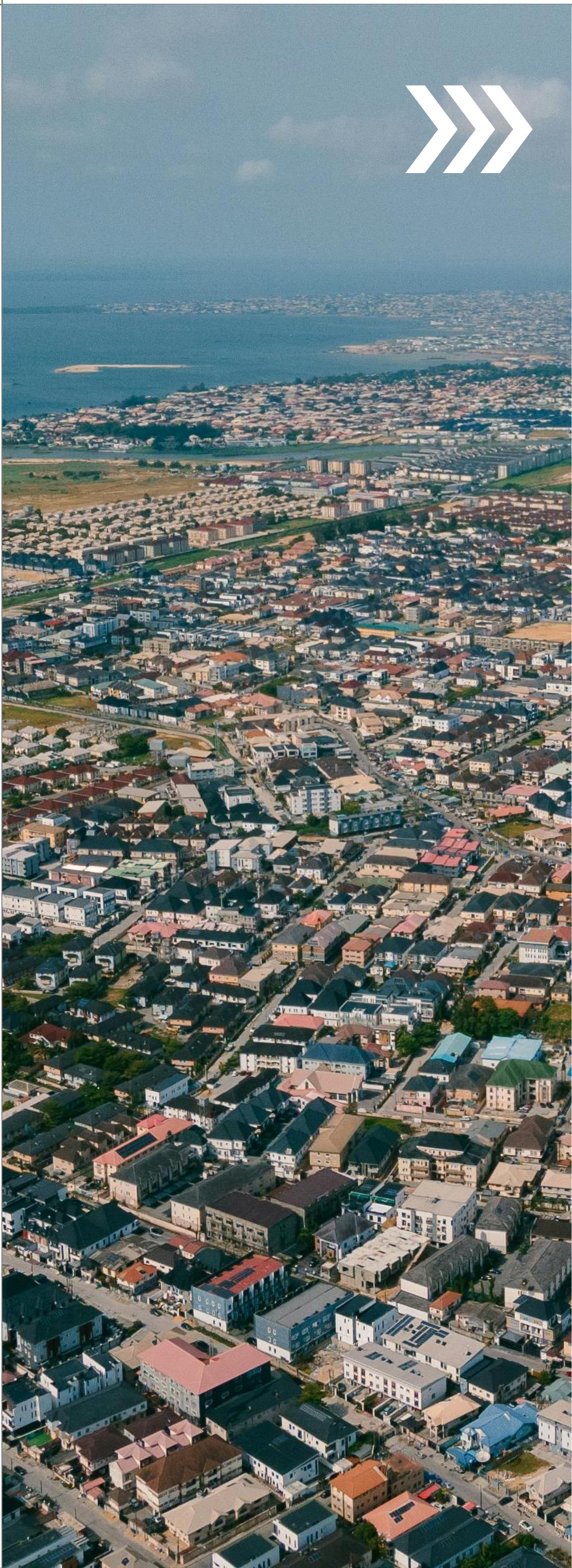

POST-2010 CLIMATE CHANGE ADAPTATION POLICIES FOR THE AGRICULTURAL SECTOR OF NIGERIA

Relevance for Economic Growth and Recommendations for Future Reforms

Author

Dr. Chukwuemeka Emenekwe

Department of Economics and Development Studies
Centre for Climate Change and Development
Alex-Ekwueme Federal University Ndufu-Alike (AEFUNAI)

Ebonyi State, Nigeria
E emenekwe.c@gmail.com;
chukwuemeka.emenekwe@funai.edu.ng
T +234(0)8143003703

CENTRE FOR CLIMATE CHANGE & DEVELOPMENT

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Acronym/ Abbreviation

Acronym	Definition
APP	Agricultural Promotion Policy
ATA	Agricultural Transformation Agenda
BAU	Business as Usual
CAADP	Comprehensive African Agricultural Development Programme
CBA	Community-Based Adaptation
CBN	Central Bank of Nigeria
CCKP	Climate Change Knowledge Portal
DCC	Department of Climate Change
ERGP	Economic Recovery and Growth Plan
FAO	Food and Agriculture Organisation
FMARD	Federal Ministry of Agriculture and Rural Development. (It is now referred to as the Federal Ministry of Agriculture and Food Security)
FMEnv	Federal Ministry of Environment
FMWR	Federal Ministry of Water Resources
GDP	Gross Domestic Product
GGWSSI	Great Green Wall for the Sahara and Sahel Initiative
IOT	Input-Output Table
KPI	Key Performance Indicators
LT-LEDS	Long-Term Low Emissions Development Strategy
NA-2050	Nigeria Agenda 2050
NAERLS	National Agricultural Extension and Research Liaison Services
NAGGW	National Agency for the Great Green Wall
NARF	National Agricultural Resilience Framework
NASPA-CCN	National Adaptation Strategy and Plan of Action on Climate Change in Nigeria
NATIP	National Agricultural Technology and Innovation Policy
NBS	National Bureau of Statistics
NCCP	National Climate Change Policy
NCCPRS	National Climate Change Policy Response and Strategy
NDC	Nationally Determined Contribution
NDP	National Development Plan
NESP	Nigeria Economic Sustainability Plan
NEWMAP	Nigeria Erosion and Watershed Management Project
NIP	National Implementation Plan
NLTP	National Livestock Transformation Plan
SAM	Social Accounting Matrix
SSP	Shared Socioeconomic Pathways

Executive Summary

Agriculture is vital to Nigeria's economy, consistently contributing about 25% of GDP and providing livelihoods for a substantial share of the population. Yet, the sector faces intensifying climate-related threats—including rising temperatures, changing rainfall patterns, flooding, and drought—that undermine crop and livestock production. Without strategic adaptation, these impacts could reduce agricultural productivity by up to 30%, destabilising food security, rural incomes, and macroeconomic growth.

This report reviews Nigeria's key agricultural and climate policies, examines sector performance since 2010, and compiles evidence on the effectiveness of various adaptation initiatives. Drawing on policy documents, macroeconomic analyses, and local case studies, it provides recommendations to strengthen resilience in the face of escalating climate challenges. Key findings include:

- Comprehensive Policy Frameworks But Gaps in Implementation
- National plans and policies, such as Vision 20:2020, the Agricultural Transformation Agenda (ATA), the National Adaptation Strategy and Plan of Action on Climate Change (NASPA-CCN), the Agriculture Promotion Policy (APP), the National Agricultural Resilience Framework (NARF), the updated Nationally Determined Contribution (NDC), and the National Agricultural Technology and Innovation Policy (NATIP), include adaptation goals. However, limited inter-agency coordination, fragmented funding, and weak monitoring have slowed the large-scale uptake of recommended practices.
- High Returns From Adaptation Measures
- Both macro-level computable general equilibrium (CGE) models and local field studies show that measures like soil/water conservation, adoption of improved seed varieties, irrigation, livestock feed innovation, and agroforestry can help mitigate productivity losses, boost incomes, and create new jobs. Community-based successes confirm that local innovations—such as borehole construction, drought-tolerant crops, and livelihood diversification—significantly enhance resilience.
- Finance Shortfalls Remain Critical
- Preliminary estimates suggest Nigeria requires about US$ 12 billion annually to close its agricultural adaptation gap, yet only a fraction of the necessary capital is being mobilised. Although climate finance inflows are slowly rising, agriculture often receives a smaller share than sectors like energy. Without additional resources, the transformative potential of existing policies is unlikely to be realised.
- Data and Monitoring Constraints
- A consistent baseline of sector-specific adaptation indicators is lacking, making it difficult to track progress or compare cost-effectiveness across different ecological zones. This data gap also hinders the design of evidence-based projects and the evaluation of long-term outcomes.

Recommendations

- Strengthen and align existing policies

- Improve inter-ministerial coordination and streamline mandates across climate-related frameworks to avoid duplication and ensure that actionable adaptation tasks are effectively delivered.

- Scale Irrigation and Infrastructure

- Prioritise public-private investments in irrigation schemes, roads, and storage facilities. Such infrastructure reduces climate vulnerability, cuts post-harvest losses, and stabilises output in both crop and livestock systems.

- Enhance extension services and capacity building

- Promote digital tools (e.g., mobile climate alerts) and strengthen on-the-ground advisory programs, ensuring they address region-specific climate challenges. Tailored training for women and youth fosters inclusive adaptation adoption.

- Integrate adaptation into macroeconomic planning

- Embed adaptation targets within national budget processes, medium-term plans (e.g., the National Development Plan), and computable general equilibrium models. By making adaptation a central point of economic policy, Nigeria can attract private capital and donor support more effectively.

- Close adaptation finance gaps

- Expand domestic budget allocations to agricultural adaptation, leveraging the climate change fund and green bonds. Engage bilateral and multilateral partners to provide additional financing, with clear investment pipelines for priority adaptation projects.

- Establish robust monitoring and evaluation

- Develop a unified system to track key adaptation metrics—from the number of hectares under climate-smart practices to financial flows. Regular data sharing among agencies will enable performance-based adjustments and evidence-driven scaling of successful interventions.

While multiple policy frameworks and pilot initiatives demonstrate what is possible, a scaled, well-funded, and coherently managed approach is needed to secure long-term resilience. By mainstreaming adaptation into macroeconomic plans, modernising extension systems, and addressing persistent financing gaps, Nigeria can safeguard its food systems, enhance rural livelihoods, and foster broad-based economic growth.

Additionally, this report proposes two scenarios—a reference and an agricultural adaptation scenario—to guide climate change adaptation mainstreaming into Nigeria's macroeconomic modelling and policymaking process with a focus on the agricultural sector (see the accompanying reports).

1. INTRODUCTION

1.1. Background and Context

Nigeria is among the largest African economies, with a population of more than 216 million people and growing at an estimated annual rate of 2.5% (NBS, 2023). In 2023, its real gross domestic product (GDP) reached approximately US$ 551 billion (World Bank WDI database), reflecting a diverse economic structure but one still heavily influenced by hydrocarbons. Despite this dependency, agriculture remains a major contributor to the nation's socio-economic fabric. Between 2010 and 2023, agriculture accounted for an average of 24.5% of Nigeria's GDP, rising from 23.9% in 2010 to a peak of 26.2% in 2020, before stabilising at around 25% in recent years (NBS, 2024). The sector is not only essential for rural livelihoods and food security but also for providing raw materials for agro-industries and contributing substantially to employment—estimates suggest up to 28.3% of the labour force is in agriculture, with rural employment as high as 44.8% (NBS, 2024; NCCC, 2023a).

The country's agricultural landscape is large, with about 78% of the country's total landmass—equivalent to roughly 708,000 km²—under agricultural use (FMEnv, 2020b, 2021b). Of this area, 48% is arable land, 42.8% is permanent meadows and pastures, and 9.2% is dedicated to permanent crops. Crop production dominates, contributing 91.1% of the sector's GDP (CBN, 2024). Key crops include cassava, yam, maize, rice, sorghum, tomatoes, groundnuts, cocoa, ginger, and various horticultural products (NAERLS & FMARD, 2021). Livestock is also prominent, with an estimated 20.8 million heads of cattle—among the largest herds in Africa—alongside sizeable poultry, sheep, and goat populations (NAERLS & FMARD, 2021). Despite these endowments, Nigeria remains a major net importer of food—one of the world's largest rice importers—while also importing wheat, dairy products, and horticultural crops (Childs & LeBeau, 2023; ITA, 2023).

Moreover, this critical agricultural sector faces increasing threats from climate change. Historically, Nigeria's climate has seen a marked warming trend. Nigeria's climate is already changing. The historical temperature trends for Nigeria over the 1950 to 2020 period reveal a significant warming pattern over the decades, indicating the growing influence of climate change, rising by approximately 1.44°C, increasing from 25.82°C to 27.26°C, according to the World Bank Climate Change Knowledge Portal (CCKP, 2021). Such trends indicate the vulnerability of Nigeria's climate to global warming.

Rainfall patterns, on the other hand, show a complex picture of variability and declining trends. While the overall trend from 1951 to 2020 shows a modest increase of 13.87 mm, recent decades differ. From 1971 to 2020, annual precipitation declined by 62.73 mm, and from 1991 to 2020, it dropped by 32.86 mm. These reductions indicate shifting rainfall patterns, with potential implications for agriculture, water availability, and ecosystems.

Projected temperature changes under future climate scenarios (SSP2-4.5 and SSP5-8.5) indicate continued and significant warming and variable rainfall patterns by 2050. Furthermore, climate models suggest that without adaptation, Nigerian agriculture could experience a 30% reduction in crop output due to erratic rainfall and higher temperatures (Cervigni *et al.*, 2013; FMEnv, 2021b; Mereu *et al.*, 2018). Over the longer term, under business-as-usual (BAU) scenarios, productivity declines of 10–25% by 2080 are possible, with some regions facing yield reductions as high as 50%. Such losses not only worsen domestic food security and rural livelihoods but also threaten macroeconomic stability, export revenues, and efforts at economic diversification.

These vulnerabilities are already evident. Nigeria's high vulnerability to climate risks is reflected in its 123rd position out of 187 countries, with a vulnerability score of 0.462, in the 2022 Notre Dame-Global Adaptation Index (ND-GAIN).[1] Moreover, The 2019 Climate Risk Index published by the Germanwatch Organization classifies Nigeria as a region of high risk and indicates that the country is one of the top most vulnerable countries in the world (FMEnv, 2021a). Under a scenario with no adaptation measures, climate change could cost the economy between 2–11% of GDP by 2020, and 6–30% by 2050—equivalent to losses of up to US$ 460 billion (DCC, 2021; World Bank, 2021).

Climate-related disasters, such as recurrent floods and prolonged droughts, already result in famine, population displacement, and conflicts in some regions (BNRCC, 2011b, 2011a; Haider, 2019; NEST & Tegler, 2011). Seasonal droughts, particularly in the country's eastern and central areas, are projected to intensify (FMEnv, 2020b; Haider, 2019). Increases in extreme rainfall events elevate the risks of soil erosion, waterlogging of crops, and consequently, diminished yields (Cervigni *et al.*, 2013; Mereu e*t al.*, 2018). Without adaptation, agricultural productivity could decline by 10–25% by 2080, and up to 50% in certain areas (NCCC, 2023a), undermining food security and the attainment of Sustainable Development Goals (SDGs)—notably Goals 1 (No Poverty), 2 (Zero Hunger), and 8 (Decent Work and Economic Growth).[2]

Such outcomes affect not only domestic food availability but also Nigeria's trade balance and macroeconomic performance. Agricultural volatility can heighten dependence on imports, inflate the food import bill, and reduce non-oil export diversification. For example, yield declines in cocoa and tomato reduce foreign exchange earnings and raise vulnerability to global market shocks. Lower dairy productivity similarly exposes the economy to volatile international prices. These impacts can exacerbate poverty and undermine growth. On the other hand, effective adaptation strategies—such as climate-resilient seed varieties, improved infrastructure, enhanced extension services, and increased irrigation—can stabilize outputs, bolster rural incomes, and support sustained economic growth. In this sense, well-designed climate adaptation and environmental policies can serve as macroeconomic stabilizers and growth drivers.

Over the past decade, Nigeria has developed several national policies and frameworks to address climate change impacts on agriculture and related sectors, as shown in Figure 1. These policies recognize that agriculture while contributing to GHG emissions, can also be transformed into a more sustainable and climate-smart system. There is potential to expand production in environmentally sustainable ways, leveraging Nigeria's abundant resources (FMEnv, 2020b, 2021b).

Given this context, it is essential to examine how historical policy efforts have fared, to identify lessons that can inform more effective adaptation responses.

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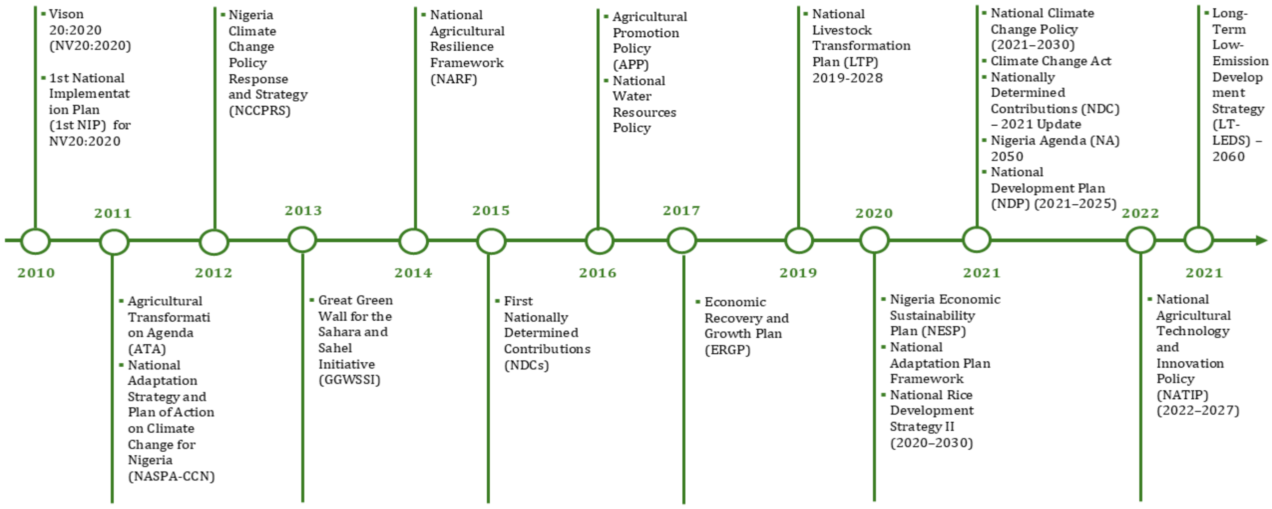
[1] The ND-GAIN Country Index summarises a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. Vulnerability measures a country's exposure, sensitivity and ability to adapt to the negative impact of climate change. Lower scores imply lower vulnerability and vice versa.

[2] The 17 Goals | Sustainable Development

Figure 1. Selected national policies relevant to agricultural climate change adaptation in Nigeria, 2010-2023



Source: Author's diagram based on a desktop search of Nigeria policies/initiatives relevant climate change adaptation in agricultural sector.

1.2. Objectives of the Report

The specific objectives of this report are to:

I. identify historical and ongoing agricultural sector relevant climate adaptation policy frameworks, programmes, plans, strategies since 2010.

II. assess agricultural sector performance in line with key targets.

III. identify key adaptation actions and highlight adaptation successes and challenges.

IV. propose actionable policy recommendation to align national development priorities with pressing climate adaptation needs.

V. describe agricultural scenarios—baseline and adaptation—for model exploration.

1.3. Organization of the Report

Following this introduction, Section 0 provides an overview of climate change in Nigeria. Section 3 provides a detailed description of Nigeria's agricultural sector with a focus on the sub-sectoral activities and their vulnerability to climate change. Section 4 highlights Nigeria's agricultural policies, plans, and strategies that shape the sector's ability to adapt to climate challenges. Section 5 assesses Nigeria's agricultural sectoral performance since 2010, highlighting performance against policy objectives. Section 6 presents agricultural adaptation in action and links to national adaptation priorities. Section 7 provides an overview of the climate adaptation financing landscape in Nigeria. Section 8 summarizes the report and provides policy recommendations.

2. CLIMATE IN NIGERIA

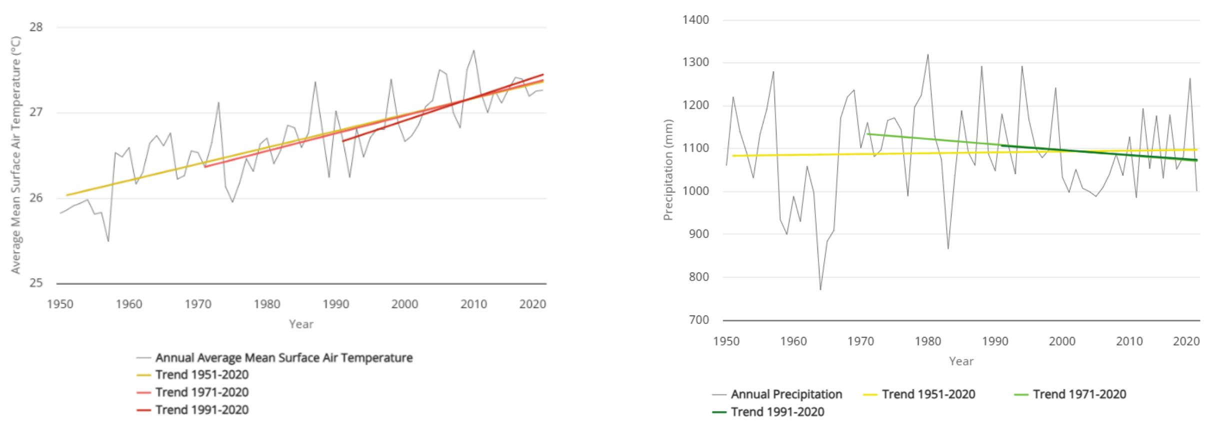
Nigeria's climate varies considerably across its territory; from the tropical wet climate of the south through the savannah conditions of the central regions to the hot, semi-arid Sahelian climate of the north (NCCC, 2023b; World Bank, 2021). Rainfall typically decreases along a south-to-north trajectory. In the south, strong rainfall events occur from March through October, often surpassing 2,000 millimetres (mm) annually and occasionally reaching 4,000 mm in the Niger Delta. Central areas experience a more defined rainy season (April to September) and a corresponding dry season (December to March), during which the Harmattan wind from the Sahara occurs. Coastal regions also have a short drier interval within the broader March-to-October rainy season, with annual rainfall commonly around 1,200 mm. By contrast, northern states receive rainfall mainly between June and September, totalling only 500–750 mm, leaving the rest of the year hot and dry. This seasonal distribution in the north exhibits significant annual variability, which in turn fosters both flooding and drought risks.

Temperature patterns mirror this diversity. Coastal and plateau areas are generally cooler than the interior lowlands. Mean annual temperatures on the plateau range between 21°C and 27°C, while lowland regions often exceed 27°C. Across the country, seasonal mean temperatures remain above 20°C, though diurnal variations—especially in the drier zones—can be more pronounced than shifts from one season to another. Typically, the hottest conditions manifest during the dry season, with relatively small differences observed from the coast inland. Relative humidity similarly declines from the south to the north, with Lagos averaging around 88% annually.

Recent observational data confirm that Nigeria's climate is already undergoing significant change. According to the World Bank Climate Change Knowledge Portal (CCKP, 2021), an analysis from 1950 to 2020 indicates a marked warming trend: between 1950 and 2020, Nigeria's annual average mean surface air temperature rose by about 1.44°C, from 25.82°C to 27.26°C (Figure 2). Notably, warming accelerated in the 1991–2020 interval, with a 0.78°C increase in that 30-year period. Rainfall patterns, conversely, demonstrate more variability.

Historical precipitation has ranged from a low of 770.75 mm in 1964 to a peak of 1,319.71 mm in 1980, showing substantial inter-annual fluctuation. Over the full study period (1951–2020), there was a small overall increase of 13.87 mm, but more recent decades reveal declines of 62.73 mm (1971–2020) and 32.86 mm (1991–2020). These figures indicate increasingly variable rainfall, potentially affecting agriculture, hydrological systems, and ecosystems.

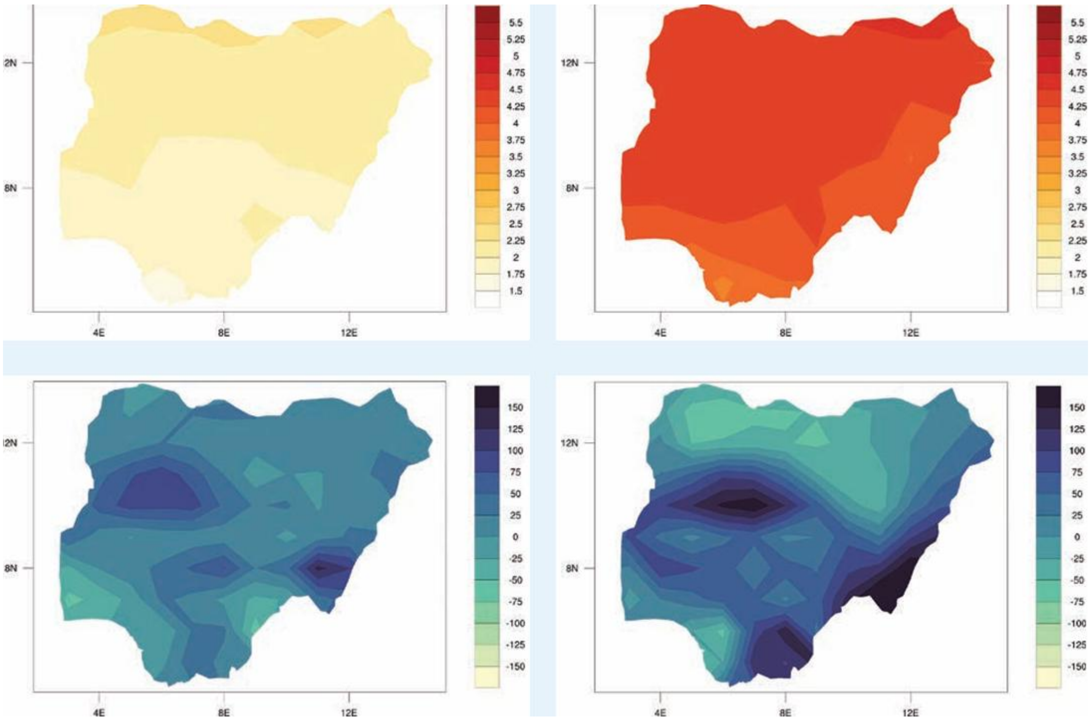
Figure 2. Observed historical climate in Nigeria



Note: The left panel is temperature in degrees Celsius (°C); the right panel is precipitation in millimetres (mm).
Source: World Bank Climate Knowledge Portal, https://climateknowledgeportal.worldbank.org/country/nigeria

Figure 3. Future climate projection in Nigeria under RCP8.5 scenario

2040–2059 2080–2099



Cmip5 Ensemble Projection	2020–2039	2040–2059	2060–2079	2080–2099
Annual Temperature Anomaly (°C)	**+0. to +1.5** (+1.0°C)	**+1.3 to +2.8** (+1.8°C)	**+2.0 to +4.2** (+2.7°C)	**+2.9 to +5.7** (+3.7°C)
Annual Precipitation Anomaly (mm)	**–18.6 to +21.5** (+0.4 mm)	**–25.6 to +29.6** (–0.3 mm)	**–28.0 to +39.4** (+2.3 mm)	**–36.0 to +47.0** (+1.6 mm)

Note: Nigeria Map: Multi-model (CMIP5) Ensemble Projected Changes (32 GCMs) in Annual Temperature (top) and Precipitation (bottom) by 2040–2059 (left) and by 2080–2099 (right), Relative to 1986–2005 Baseline Under RCP8 5
Table: shows CMIP5 ensemble projection under RCP8.5. Bold value is the range (10th–90th Percentile) and values in parentheses show the median (or 50th Percentile).

Projections of future climatic conditions follow the CMIP5 (Coupled Model Inter-comparison Project Phase 5) data ensemble, as presented in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). Four Representative Concentration Pathways (RCP2.6, RCP4.5, RCP6.0, and RCP8.5) illustrate the possible trajectories of global greenhouse gas (GHG) emissions. RCP2.6 implies strong mitigation, whereas RCP8.5 follows a business-as-usual pattern. In a high-emission scenario (RCP8.5), multi-model projections show that Nigeria's temperature may increase by 2.9°C to 5.7°C by the end of the century (GERICS). Nighttime temperatures could rise by as much as 4.7°C, and heat waves could last an additional 8 to 55 days, posing concerns for human health, agriculture, and ecosystems.

Although the southern regions may warm at a slower rate, the interior and northern states could experience higher temperature increases. Low temperatures across all regions are also expected to increase, suggesting intense warming throughout the year (Figure 3).

Rainfall forecasts remain less definitive, reflecting Nigeria's inherent variability. There are indications of rainfall increases toward the late rainy season and early dry season (September–December). More extreme rainfall events are likely, increasing flood risks along rivers and areas prone to surface runoff during peak rainy months. Natural disasters associated with intense flooding and drought could thus occur more frequently and with greater severity.

On an aggregate national scale, total annual precipitation may remain near historical values in certain scenarios, but under the highest-emission pathway (RCP8.5), rainfall might decrease significantly in the north while increasing in the south and coastal areas. Effective water management, including storage infrastructure and contingency planning, will be essential to cope with both the spatial and temporal shifts in precipitation.

Table 1 provides an overview of likely future climate trends for four of Nigeria's ecological zones: mangrove, rainforest, tall-grass savanna, and short-grass Sahel (BNRCC, 2011a; Haider, 2019). Temperature is projected to rise across all zones, but rainfall trends show increases in mangrove and rainforest areas and possible decreases in the savanna and Sahel. Higher rainfall variability is anticipated everywhere, implying more intense wet and dry spells. Extreme rainfall events—storms and floods—are especially likely to become more frequent in the southern and savanna zones, while droughts could affect all regions. Sea level rise stands out as a key risk for coastal mangrove zones, indicating increased concerns about flooding and coastal erosion in low-lying areas.

Table 1. Summary of climate trends by ecological zone

CLIMATE VARIABLES	MANGROVE ZONE	RAINFOREST	TALL GRASS (SAVANNA)	SHORT GRASS (SAHEL)
TEMPERATURE	↑	↑	↑	↑
RAINFALL AMOUNT	↑	↑	↓	↓
RAINFALL VARIABILITY	↑	↑	↑	↑
EXTREME RAINFALL EVENTS – DROUGHTS	Likely	Likely	↑	↑
EXTREME RAINFALL EVENTS – STORMS AND FLOODS	↑	↑	Likely	Likely
SEA LEVEL RISE	↑	NA	NA	NA

Note: Legend: ↑ = likely increase or increase; ↓ = likely decrease or decrease; NA = not applicable
Source: BNRCC (2011a); Haider (2019).

Nigeria's climate vulnerability is amplified by four key climatic impact drivers (CIDs): sea-level rise, intense rainfall, aridity, and rising mean temperatures. The country is exposed to frequent natural hazards, including floods, storms, ocean surges, droughts, and wildfires. According to the Notre Dame Global Adaptation Initiative (ND-GAIN), Nigeria ranks 123rd out of 187 countries on its vulnerability index, which measures both vulnerability to climate change and readiness to enhance resilience.[3] This is, in part, because an estimated 24% of the population live in areas with high climate exposure. Prominent risks exist in northern border states (e.g., Sokoto, Yobe, Borno), as well as in coastal states (e.g., Lagos, Rivers, Delta). Given the nation's reliance on climate-sensitive sectors—agriculture, forestry, and hydrocarbon extraction—climate inaction could cost between 6% and 30% of its GDP by 2050, or roughly US$100–460 billion (World Bank, 2020).

Other findings place Nigeria among the top ten most climate-vulnerable countries worldwide (Climate Scorecard, 2019).[4] The northern regions frequently experience aridity and riverine flooding, while the Niger Delta experiences both inland flooding and storm surges. Tensions over land and water rights are elevated in the central and northern zones due to

[3] ND-GAIN Index Country Rankings. https://gain-new.crc.nd.edu/

[4] Climate Scorecard (2019). https://www.climatescorecard.org/2018/11/nigeria-listed-as-one-of-the-10-most-climate-vulnerable-countries/

prolonged dry spells (USAID, 2018). The major floods in 2012 inflicted nearly US$17 billion in damages and losses across 12 states; the same year, severe droughts struck the northeast (NEMA, 2013). Low-income households remain especially vulnerable to these natural disasters (Echendu, 2020). About 27 to 53 million people may require relocation by century's end if sea levels rise by 0.5 meters, an especially pressing concern given ongoing coastal erosion, pollution, and the steady destruction of mangrove forests in the Delta, which serve as a natural storm-surge buffer. Beyond these structural and environmental challenges, climate events also intensify food insecurity through soil erosion, nutrient leaching, and crop failures, while water scarcity impacts household consumption, agriculture, and industry.

Human activities—deforestation, poor watershed management, and settlement in flood-prone areas - aggravate the severity and frequency of floods, droughts, and wildfires. Fire in Nigeria often stems from land clearing, waste disposal, or hunting practices, particularly between January and March when temperatures exceed 35°C and dry harmattan winds blow southward. Heavy rainfall in hilly regions regularly triggers landslides, mudslides, and gully erosion in sedimentary landscapes, while prolonged dryness exacerbates competition for water resources and interrupts hydropower supply (FMEnv, 2020b).

In the face of these realities, climate change is predicted to increase both the risk and intensity of flooding and drought, particularly in the eastern and central regions—ultimately leading to famine, population displacement, and conflicts over resource scarcity (FMEnv, 2020b). Recent extreme events illustrate these trends: major floods in 2012 affected seven million people and caused roughly US$16.9 billion in damage (or 1.4% of that year's real GDP growth), while flooding in 2015 impacted a million people at a cost of about US$25 million (DCC, 2021). A 2009 DFID study estimates that if no adaptive measures are taken, Nigeria could lose 2–11% of its GDP by 2020 (FMEnv, 2020b). Increased rainfall intensity, in conjunction with rising temperatures, further strains food security and water availability. Seasonal droughts and excessive rainfall degrade agricultural land, compromise food systems, and worsen poverty, especially among subsistence farmers.

Lastly, data compiled by the EM-Dat database (CRED, 2023) offer a quantitative overview of the country's exposure to natural disasters (Table 2) Nigeria has experienced 75 recorded events involving drought, extreme temperatures, flooding, mass movements, and storms since 1960, resulting in over 3,600 deaths, nearly 40 million people affected, and almost US$6 billion in damages. These statistics suggest a necessity for comprehensive adaptation strategies to cope with the diverse and rising climate impacts—from sea-level rise in coastal zones to severe droughts and floods in northern and central regions—thereby safeguarding both economic development and social well-being.

Table 2. Climate-linked natural disasters in Nigeria, 1967-2024

DISASTER TYPE	DISASTER SUBTYPE	EVENT COUNT	TOTAL DEATHS	TOTAL AFFECTED	TOTAL DAMAGE ('000 US$)
DROUGHT	Drought	2		22,110,398	217,522
EXTREME TEMPERATURE	Cold wave	1	18	ND	ND
	Heatwave	1	60	ND	ND
FLOOD	Flash flood	7	334	109,995	13,664
	Flood (General)	25	1,811	6,865,574	4,827,677
	Riverine flood	28	1,110	10,275,064	907,572

DISASTER TYPE	DISASTER SUBTYPE	EVENT COUNT	TOTAL DEATHS	TOTAL AFFECTED	TOTAL DAMAGE ('000 US$)
MASS MOVEMENT (WET)	Landslide (wet)	3	32	1,800	ND
STORM	Lightning/Thunderstorms	3	54	16,012	1,327
	Severe weather	1	7	1,500	ND
	Storm (General)	4	201	1,507	ND
TOTAL		**75**	**3,627**	**39,381,850**	**5,967,762**

Note: The total damage here is largely understated. For example, the nationwide floods in 2012 alone were estimated to have cost approximately US$17 bn in losses and damages (NEMA, 2013).

Source: Author's compilation using data from EM-Dat database (CRED, 2023). ND means no data available.

3. AGRICULTURAL SECTOR IN NIGERIA

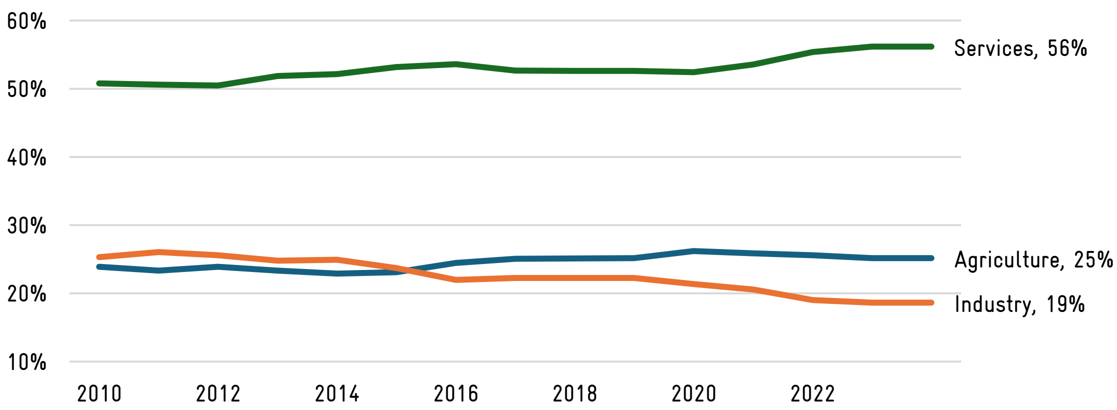
3.1. Overview

Agriculture is a critical contributor to Nigeria's socio-economic structure, playing an essential role in employment, food security, rural livelihoods, and industrial raw material provision. Between 2010 and 2023, the sector contributed an average of 24.5% to Nigeria's Gross Domestic Product (GDP)—rising from 23.9% in 2010 to a peak of 26.2% in 2020, and stabilizing around 25% in recent years (NBS, 2024) (see Figure 4). Furthermore, it employs an estimated 28.3% of the labour force, with rural employment reaching 44.8% (NBS, 2024; NCCC, 2023a). Despite these robust contributions, Nigeria remains a net food importer, particularly of rice, wheat, dairy products, and horticultural crops (Childs & LeBeau, 2023; ITA, 2023). This highlights ongoing production gaps and underscores the importance of strengthening the agricultural sector, especially in the face of growing climate change threats.

3.2. Land Use and Production

Nigeria's agricultural land covers about 78% of its total land area (roughly 708,000 km²), of which 48% is arable, 42.8% is devoted to permanent meadows and pastures, and 9.2% is under permanent crops (CBN, 2024; FMEnv, 2020b, 2021b). Crop production generates approximately 91.1% of the sector's GDP (Figure 5). Major crops include cassava, yam, maize, rice, sorghum, tomatoes, groundnuts, cocoa, ginger, and assorted horticultural products (NAERLS & FMARD, 2021). Livestock production is also significant, with about 20.8 million cattle—the largest herd in Africa—alongside large poultry, sheep, and goat populations (NAERLS & FMARD, 2021). Despite abundant resources, agricultural production has struggled to meet growing national food demand. Consequently, food import bills rose sharply; the NBS Foreign Trade Statistics report shows that the value of food imports in Q1 2024 increased to ₦920.54 billion (29.4%) from ₦711.4 billion expended in Q4 2023, emphasizing the importance of improving domestic production.[5]

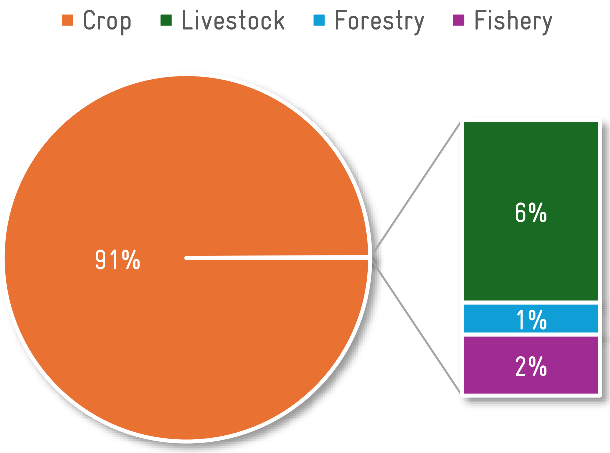
Figure 4. Sectoral Share of GDP in Nigeria, 2010–2023 (constant basic prices)



Source: Author's diagram using data from the annual statistical bulletin (CBN, 2024)

[5] BusinessDay (2024). https://businessday.ng/agriculture/article/nigerias-food-import-hits-5-year-high/

Figure 5. Agricultural sub-sectors' share of GDP in Nigeria, 2023



Source: Author's diagram using official statistics (CBN, 2024)

Estimates of agriculture's share of total employment range between 28.3% (NBS, 2024; NCCC, 2023a) and 35%, indicating its continued role as a key livelihood source. The sector is dominated by smallholder farmers who cultivate less than 2 hectares on average (Onyeneke *et al.*, 2019). Low mechanization, poor soil fertility, and reliance on manual labour characterize much of Nigeria's farming. Women's labour is particularly vital, accounting for 60–80% of staple food production and much of the post-harvest processing (NEST & Tegler, 2011). Cultural and religious practices across various regions, however, shape differences in women's on-farm activities.

Over time, various policies and programs—such as the Anchor Borrower Program (ABP, now discontinued) and other youth-driven agricultural initiatives—have sought to boost local production, reduce food imports, and stimulate enterprise in commodities like rice and cassava. Additional measures, including border closures, have been introduced to curb smuggling and boost local output of rice and poultry. Nevertheless, less than 2% of farming operations use irrigation; consequently, rain-fed agriculture prevails and remains highly vulnerable to climate variability and extremes (FMFBNP, 2021b; Onyeneke *et al.*, 2019; Xie *et al.*, 2017).

3.3. Climate Change Impacts and Vulnerabilities

Nigeria's agriculture is sensitive to climatic factors—particularly rainfall and temperature. Northern regions (Savannah and Sahel) are more prone to desertification and drought, while southern areas (Coastal and Rainforest zones) confront episodic flooding, erosion, and rising sea levels. In dry northern zones, desertification reduces farmland productivity through soil degradation and water scarcity. Southern states, meanwhile, face risks from flooding and erosion, which can cause farmland losses and soil nutrient depletion. Studies project that under certain climate scenarios (e.g., RCP2.6 and RCP6.0), yields of crops such as maize, millet, sorghum, and wheat may decline, while cassava could benefit due to its tolerance of temperature and precipitation extremes (Cervigni *et al.*, 2013; FMEnv, 2020b; Mereu *et al.*, 2018). These vulnerabilities highlight the need for targeted adaptation strategies that consider regional ecological conditions and farming systems.

3.4. Crop Sub-Sector

The distribution and success of crop production in Nigeria reflect ecological zones and climatic conditions (NEST & Tegler, 2011). Rainfall ranges from over 3,500 mm annually in southern coastal zones to less than 600 mm in the arid Sahel. Inter-annual rainfall variability, especially in northern regions, leads to hazards such as floods, windstorms, and drought.

- Coastal and Rainforest Zones: Longer rainy seasons favour root crops (e.g., cassava, yam, cocoyam), alongside maize, rice, and tree crops like cocoa, palm oil, and rubber (Table 3).

- Middle-Belt Savannah: Receives moderate, seasonal rainfall suitable for both cereals (maize, rice) and some root crops (yam, cassava).

- Northern Savannah and Sahel: Characterized by short, variable wet seasons. Staple crops include sorghum, millet, maize, and rice, while legumes like groundnuts and cowpeas are also prominent.

Climate change hazards—ranging from intense rainfall and flooding to temperature extremes—negatively impact crop yields and soil fertility.

Table 4 outlines these hazards, their impacts, and underlying vulnerability in different agro-ecological zones. Common determinants of vulnerability include poverty, heavy reliance on rain-fed agriculture, lack of weather and climate forecasting systems, and limited access to resources (NEST & Tegler, 2011).

Table 3. Major crops grown in various Nigerian agro-ecological zones

CROP TYPE	SOUTHERN COASTAL AND RAINFOREST	MIDDLE-BELT SAVANNA	NORTHERN SAVANNA AND SAHEL
ROOT CROPS	• Cassava • Yam • Cocoyam • Sweet potato	• Yam • Cassava	• Carrot • Irish potato • Sweet potato
CEREALS	• Maize • Rice	• Maize • Rice	• Sorghum • Millet • Maize • Rice
LEGUMES			• Groundnut • Cowpeas
TREE CROPS	• Cocoa • Palm oil • Rubber	• Citrus • Mango	

Source: NEST and Tegler (2011)

Table 4. Hazard-impact-vulnerability matrix for agriculture: Crop

Hazard	Climate Change Impacts	Determinants of Vulnerability
ECOZONE: COASTAL / RAINFOREST		
Increased rainfall intensity	• Gully and sheet erosion lead to: • Loss of farmlands • Leaching and loss of soil fertility • Low crop yield • Pest infestation • Loss of deep-rooted crops due to soil waterlogging	• Dependence on crop production for livelihoods • Poverty • Dominant crops in the farming systems are prone to erosion; most plots are hilly • Lack of weather forecasting/information
Sea level rise	• Loss of farmland • Saltwater intrusion into farmlands • Soil becomes hard to till due to the presence of salt • Loss of biodiversity in saline soils • Low productivity	• Poverty • Living on low-lying plains
Rising temperature	• Scorched crops due to excessive heat • New crop pests and diseases • Poor yield • Reduced germination	• Dependence on crop production for income • Poverty
Changing rainfall pattern (dryness and drought)	• Changing cropping calendar/dates • Potential increased pest incidence • Crop failure • Low yield	• Dependence on rain-fed agriculture • Poverty • Lack of access to resources on climate change trends and weather forecasting
Severe windstorms	• Loss of farm assets • Low productivity • Loss of livelihood	• Lack of access to resources on climate change trends and weather forecasting • Dependence on crop production for income
ECOZONE: SAVANNAH		
Changing rainfall pattern (late-onset & early cessation of rain)	• Late planting of crops • Low germination of seeds • Stunted crop growth • Low crop yield and reduced marketable surplus, reduced income • Post-harvest losses and prolonged hunger	• Poverty • Dependence on crop production
Rising temperature	• Scorching/wilting of crops	• Dependence on crop production • Low vegetative cover
Severe windstorms	• Low productivity • Movement of sand dunes • Reduced pollination	• Low vegetation cover • Poverty
Changing rainfall regime/pattern	• Affects cropping calendar • Low crop yield • Late harvesting • Drought	• Dependence on rain-fed agriculture • Poverty • Dependence on crop production for income • Lack of access to resources on climate change trends and weather forecasting

Hazard	Climate Change Impacts	Determinants of Vulnerability
ECOZONE: SAHEL		
Late-onset and early cessation of rainfall	• Late planting of crops • Low germination of seeds • Wind-scorching of crops • Low crop yield and reduced marketable surplus, reduced incomes • Late harvesting	• Dependence on rain-fed agriculture • Dependence on crop production
Changing rainfall patterns and distribution through the season	• Low crop yield • High cost of production using more inputs • Poverty	• Dependence on rain-fed agriculture • Dependence on crop production
Occasional and increased intensity of rainfall	• Seasonal flooding • Loss of food crops • Loss of farm assets	• Dependence on rain-fed agriculture • Poverty
Rising temperature	• Early wilting of crops • Scorching/wilting	• Lack of vegetative cover • Dependence on rain-fed agriculture • Poverty

Source: NEST and Tegler (2011)

3.5. Livestock Sub-Sector

Livestock accounts for about 6% of Nigeria's agricultural GDP (Figure 5) (CBN, 2024), providing income, nutrition, farm energy, and manure. Pastoral herding dominates the Sahel and parts of the Savannah, where an estimated 75% of Nigeria's livestock are concentrated. Major species include cattle, goats, sheep, camels, and local poultry, with feed sources primarily from rangelands, tree forage, and crop residues (NAERLS & FMARD, 2021).

In all agro-ecological zones—coastal/rainforest, savannah, and sahel—late onset or early cessation of rainfall, temperature extremes, flooding, and windstorms pose significant threats to livestock. Water scarcity limits fodder production, higher temperatures elevate disease risks, and flooding can destroy livestock enclosures and promote outbreaks. In coastal areas, sea-level rise and saltwater intrusion undermine pasture quality (NEST & Tegler, 2011).

Poverty, lack of alternative livelihoods, and minimal infrastructure amplify this vulnerability. Men are predominantly involved in livestock production, but women are impacted through reduced household income and their roles in marketing dairy products. Adaptive strategies—such as seasonal migration, small-scale irrigation, water harvesting, forage supplementation, and basic veterinary methods—help mitigate impacts but require additional support and investment.

Table 5. Hazard-impact-vulnerability matrix for livestock

Hazard	Climate Change Impacts	Determinants of Vulnerability
ECOZONE: COASTAL/RAINFOREST		
Late-onset and early cessation of rainy season	• Lack of availability of water for livestock • Reduced forage availability	• High dependence on water for livestock production • Poverty
Rising temperature	• Poor livestock health, reducing the market value of affected livestock • Reduced farmers' income • Reduction in livestock production	• Dependence on livestock production • Poverty
Increased intensity of rainfall	• Loss of livestock • Destruction of livestock houses • Loss of pastureland from flooding and erosion	• Dependence on livestock production • Poverty
Severe windstorm	• Fodder crops can be destroyed • Destruction of livestock houses	• Dependence on fodder from rangeland • Poverty
Sea level rise	• Decline in livestock fodder & pasture lands	• Dependence on livestock production • Poverty
ECOZONE: SAVANNAH		
Late-onset and early cessation of rainy season	• Reduced fodder production leads to reduced livestock production • Lack of available water for cattle • Loss of pasture/rangeland for cattle • Heat stress	• Poverty • Dependence on livestock production
Rising temperature	• Heat stress • High incidence of disease • Reduced livestock production • Loss of pasture	• Poverty • Dependence on livestock production
Occasional increase in rainfall intensity	• Destruction of livestock houses from flooding • Outbreak of diseases, like foot rot	• Poverty • Dependence on livestock production
Severe windstorms	• Fodder crops destroyed • Loss of pastureland • Destruction of livestock houses • Outbreak of diseases like livestock catarrh	• Dependence on fodder from rangeland • Poverty
ECOZONE: SAHEL		
Late-onset and early cessation of rainy season	• Drought and desertification lead to loss of rangeland/pasture for livestock	• Poverty • Dependence on livestock production • Lack of weather forecasting resources
Rising temperature	• More frequent droughts • Heat stress • High incidence of diseases	• Poverty • Dependence on livestock production
Occasional increase in rainfall intensity	• Loss of livestock • Destruction of livestock houses	• Poverty • Dependence on livestock production

Hazard	Climate Change Impacts	Determinants of Vulnerability
	• Outbreak of diseases like foot rot • Death of cattle	
Severe windstorms	• Loss of pastureland • Destruction of livestock houses • Outbreak of diseases like livestock catarrh	• Dependence on fodder from rangeland • Poverty

Source: NEST and Tegler (2011)

3.6. Sectoral Linkages

Agriculture is deeply integrated into Nigeria's economic structure through its direct effects (output from agricultural production itself) and indirect effects (linkages with other sectors). When a positive agricultural shock occurs—such as increased government spending, investments, or demand—the impacts manifest through the economy via forward and backward production linkages as well as consumption linkages.

Forward linkages involve agriculture supplying raw materials to agro-based industries such as food processing and textiles (e.g., SAM/IOT intermediate consumptions). For instance, increased agricultural production raises the supply of inputs like cassava for flour production or cocoa for food processing. This stimulates manufacturing output and creates new job opportunities in high-value sectors. For example, when food-processing industries expand due to greater agricultural input, they also generate ripple effects across sectors like packaging and retail services, creating a chain reaction that strengthens the economy.

Backward linkages, on the other hand, are driven by agriculture's demand for inputs from upstream sectors like manufacturing and services. These inputs include fertilizers, machinery, transport, and infrastructure. For instance, the construction of rural roads, irrigation systems, and storage facilities enables farmers to access markets more efficiently, reducing post-harvest losses and improving incomes. In this way, agriculture catalyses growth in industries that supply critical inputs for farming operations.

The consumption linkages of agriculture in Nigeria are equally impactful. Increased agricultural production raises household incomes, particularly in rural areas, where agriculture is the primary livelihood. Higher incomes boost demand for non-agricultural goods and services, such as healthcare, education, and retail products. These consumption-driven effects increase the overall economic impact of agricultural growth. Evidence suggests that consumption linkages contribute to as much as 75–90% of total multiplier effects in sub-Saharan Africa (Breisinger *et al.*, 2010), reflecting the centrality of agriculture to economic development. This dynamic is further enhanced by the distribution of income to households, whose spending circulates within the economy, stimulating even broader growth.

This reports uses the most recent Social Accounting Matrix (SAM) for Nigeria provided by the International Food Policy Research Institute (IFPRI) (Pauw *et al.*, 2023) to estimate sectoral linkages in the Nigerian economy. This report first describes the technical coefficients matrix (Table 6) that describes the nature of intermediate consumption demand across the broad macroeconomic sectors of the Nigerian economy and secondly, estimates the direct backward and forward linkages (Table 7) for agriculture and other sectors.

3.6.1 Intermediate Demand in Nigeria

Table 6 shows the technical coefficients matrix for Nigeria. The agriculture sector predominantly relies on its own output for intermediate inputs, as reflected by 20% of inputs sourced from agriculture itself. The sector also imports small amounts of inputs from manufacturing (4%) and other services (4%). This indicates that agriculture is primarily factor-intensive, with labour, land, and capital making up the remaining

73% of inputs. Notably, land accounts for the largest share (34%), suggesting that land-based agricultural activities remain a central feature of Nigeria's agricultural production system.

Agroindustry relies significantly on its own production for intermediate inputs, utilising 48 percent from this sector. It also draws 21% from agriculture, 3 percent from manufacturing, and 3% from other services, underscoring the sector's strong connections with both the agricultural and agro-industrial sectors. The agroindustry dedicates 6% to labour and 19% to capital, revealing a relatively higher dependence on intermediate inputs compared to agriculture. This reflects the sector's higher level of industrialization and technological integration, especially within the agro-processing subsector.

The manufacturing sector's intermediate inputs consist of 4% from agriculture, 4% from agroindustry, 28% from its own output, 8% from other industries, and 18% from other services, totalling 62% intermediate inputs. These figures show a moderate reliance on inputs from other sectors and highlight the sector's broad-based linkages. Manufacturing allocates 7% to labour and 30% to capital. These proportions suggest that manufacturing in Nigeria is relatively capital-intensive, with internal manufacturing inputs playing a significant role.

Table 6. Technical coefficient matrix based on IFPRI 2021 SAM for Nigeria

	Agriculture	Agroindustry	Manufacturing	Other Industry	Trade Services	Other Services
Commodities:						
Agriculture	0.20	0.21	0.04	0.00	0.00	0.00
Agroindustry	0.00	0.48	0.04	0.00	0.03	0.03
Manufacturing	0.03	0.03	0.28	0.35	0.03	0.07
Other Industry	0.00	0.00	0.08	0.03	0.00	0.01
Trade Services	0.00	0.00	0.00	0.00	0.00	0.02
Other Services	0.04	0.03	0.18	0.17	0.10	0.36
Production Factors:						
Labour	0.22	0.06	0.07	0.10	0.31	0.16
Land*	0.34	0.00	0.00	0.00	0.00	0.00
Capital	0.17	0.19	0.30	0.34	0.52	0.36

Note: *Agricultural Land.
Source: Author's computation using IFPRI Nigerian 2021 Social Accounting Matrix (SAM)

The other industry sector predominantly uses manufacturing inputs, contributing 35% of the sector's intermediate requirements. Additionally, 17% of inputs come from other services, totalling 55% intermediate inputs overall. The remaining inputs are primarily derived from labour (10%) and capital (34%). A heavy reliance on manufacturing inputs signifies strong cross-sectoral linkages essential for the industrial fabric of the economy. Moreover, the capital-intensive nature of the sector is evident through its significant allocation to capital expenditures.

Trade services demonstrate a relatively smaller reliance on intermediate inputs, with only 3 percent sourced from agroindustry and manufacturing sectors, and 10 percent from other services. Consequently, 84% of the sector's inputs are accounted for by labour (31%) and capital (52%). This indicates that trade services in Nigeria are highly factor-intensive, favouring capital contributions, which alongside labour, facilitate the sector's broader economic functions, such as retail and wholesale trade.

Other services display a somewhat diversified input structure, with 49% of intermediate inputs drawn from various sectors: 3% from agroindustry, 7% from manufacturing, 1% from other industry, 2% from trade services, and 36% from services. The remaining 51% stems from labour (16%) and capital (36%). The balanced input structure of this sector, while somewhat leaning toward factor intensity, demonstrates its reliance on the domestic service sector as an essential source of economic value. This detailed analysis of sectoral linkages within Nigeria's economy provides insight into how different sectors interact through their intermediate input requirements and factor payments. It highlights the varying degrees of sectoral self-reliance and their respective dependencies on labour and capital, thus guiding policy decisions aimed at fostering sectoral growth and economic diversification.

Table 7. Backward and forward linkages of the agric. sector with other sectors in Nigeria

SECTOR	BACKWARD LINKAGE	LINKAGE STATUS	FORWARD LINKAGE	LINKAGE STATUS
AGRICULTURE	0.85	Weak	1.18	Strong
AGROINDUSTRY	1.61	Strong	1.38	Strong
MANUFACTURING	1.41	Strong	1.49	Strong
OTHER INDUSTRY	1.33	Strong	0.74	Weak
TRADE SERVICES	0.82	Weak	0.63	Weak
OTHER SERVICES	1.18	Strong	1.78	Strong

Source: Author's computation using IFPRI Nigerian 2021 Social Accounting Matrix (SAM)

3.6.2 Sectoral Direct Backward and Forward Linkages in Nigeria

Table 7 shows the backward and forward linkages. Agriculture exhibits a relatively weak backward linkage (0.85), indicating that it draws less on inputs from other sectors. However, its forward linkage (1.18) is strong, suggesting that it provides substantial outputs for use in downstream industries.

Nigeria's agricultural sector faces significant challenges that constrain its integration with other economic sectors. Internally, the sector faces issues such as limited access to modern farming technologies, inadequate infrastructure, and insufficient financial services. Many farmers operate at subsistence levels, lacking the means to invest in mechanization or quality inputs, which hampers productivity and the ability to supply raw materials to industries like manufacturing and services. Externally, the broader economic environment presents obstacles including poor transportation networks, unreliable power supply, and policy inconsistencies. These factors disrupt the efficient movement of agricultural goods to markets and processing facilities, weakening the sector's forward and backward linkages within the economy.

Compounding these structural challenges are climate shocks that exacerbate the sector's vulnerabilities. Nigeria has experienced increased frequency and intensity of extreme weather events, such as floods and droughts, which devastate crop yields and disrupt food supply chains. The interplay between these internal constraints and external climate shocks underscores the need for comprehensive strategies that address both infrastructural deficiencies and environmental challenges to strengthen the agricultural sector's linkages with the broader Nigerian economy. In other words, the results pattern in Table 6 underscores the role of agriculture as a key supplier of raw materials and intermediate goods, but it also highlights an opportunity to strengthen agriculture's connections with upstream activities—such as the supply of fertilisers, machinery, or services—to enhance productivity and overall economic integration.

Agroindustry has both a strong backward linkage (1.61) and a strong forward linkage (1.38). Its high backward linkage suggests that agroindustry sources many inputs from various sectors, including agriculture, while its forward linkage indicates that it also delivers a substantial portion of its output to other industries. This dual strength makes agroindustry a critical bridge between primary production (e.g., agriculture) and more advanced manufacturing or service-oriented sectors. Policies that reinforce this sector's position could encourage more value addition and diversification.

Manufacturing also stands out with strong backward (1.41) and forward (1.49) linkages, showing that it draws significantly on inputs from other sectors and provides important outputs in return. These finding positions manufacturing as a potential driver of structural transformation, given its capacity to stimulate both upstream and downstream activities. Ensuring consistent input supply and expanding market access for manufactured goods can help solidify the sector's role as an engine of growth.

Other industry presents a mixed picture: its backward linkage (1.33) is strong, implying that it makes considerable use of inputs from the rest of the economy, but its forward linkage (0.74) is weak, indicating that it supplies less output to other sectors. This imbalance suggests that while other industry may support upstream suppliers, it could do more to provide goods or services that other sectors can incorporate into their own production processes. Addressing barriers that limit output usage—such as market fragmentation or limited distribution networks—could strengthen its role in the broader economy.

Trade services show weaker linkages in both directions (0.82 backward and 0.63 forward). The sector does not heavily rely on inputs from other sectors, nor does it appear to supply large amounts of intermediate goods or services. While trade services often serve as a conduit for goods moving between producers and consumers, these numbers indicate relatively low integration with other segments of the economy. Targeted measures to improve logistics, transportation infrastructure, and business development services could enhance trade services' role in connecting different industries.

Other services record a strong backward linkage (1.18) and an even stronger forward linkage (1.78), illustrating that this sector both consumes substantially from other sectors and supplies a wide array of services that many industries depend upon. The notably high forward linkage signals the importance of services—such as finance, telecommunications, or professional services—in enabling production and distribution across the economy. Policies that support service-oriented firms and enhance the quality-of-service provision can have broad-based benefits, given the sector's extensive reach.

Taken together, these results suggest that agroindustry, manufacturing, and other services can serve as key nodes for stimulating inclusive growth, thanks to their robust backward and forward linkages. Strengthening agriculture's backward linkages, boosting the forward linkages of other industry, and enhancing the overall integration of trade services may further diversify Nigeria's economic base and reinforce cross-sectoral ties. Such efforts could include targeted investments in infrastructure, skill development, and policy reforms that facilitate input-output flows among these interconnected sectors.

4. RECENT TRENDS IN AGRICULTURAL CLIMATE CHANGE ADAPTATION POLICIES

In recent years, Nigeria has developed several national policies and frameworks to address climate change impacts on agriculture and related sectors. These policies recognise that agriculture while contributing to GHG emissions, can also be transformed into a more sustainable and climate-smart system. This section provides an overview of government policies, plans and strategies toward climate change adaptation in the agricultural sector since 2010.

4.1. The Nigerian Vision 20:2020 (NV20:2020)

Vision 20:2020 set a target that by 2020, Nigeria will have a large, strong, diversified, sustainable and competitive economy that guarantees a high standard of living and quality of life to its citizens (FGN, 2010). This Vision reflects the intent of the Federal Republic of Nigeria to become one of the top twenty (Top-20) economies in the world by the year 2020, with an overarching growth target of at least $900 billion in GDP and a per capita income of at least $4,000 per annum.

Although the NV20:2020 is a national development plan, not an agricultural or climate action plan, it nonetheless contains agricultural sector policies, programmes and targets. Following the launching of the NV20:2020, several implementation plans were developed; the first national implementation plan (1st NIP) was prepared for the period 2010 to 2013, the 2nd NIP 2013-2015, and the 3rd was prepared for 2016-2020. The identified agricultural sector goals, policies, and targets as well as adaptation relevant aspects are presented in Table 8.

Table 8. Agricultural goals and targets of the Vision 20:2020

Overall goals and targets	Current	2015	2020
To achieve an increase in domestic agricultural productivity		300%	600%
Expand dairy production and milk yield (kg per cow per lactation)	<2,000 kg	5,000 kg	
Achieve farm-gate storage			20%
Achieve commercial storage			75%
To reduce food import from current levels		50%	90%
To reduce agricultural post-harvest losses		50%	90%
Increase the size of the irrigated land share of cultivable land	1%	10%	25%
To achieve an efficient extension delivery system which includes an extension worker: farmer ratio of 1:500 by 2020			✓
Sub-Sectoral Focus of National Implementation Plans under the Vision 20:2020			
Crop Sub-Sector	Crops Identified for Value Chain Support: rice, palm oil, cotton, cassava, wheat, cocoa, sesame, tomato and groundnut.		

	Production of 62,500 MT of certified seeds and 27.5 MT breeder seeds, 508 MT foundation seed and establishment of agric seeds centres in the 36 states and FCT to increase farmers' productivity and farm income. Construction and completion of ongoing silos to increase the number of silos to 44 with a storage capacity of 3 million MT. Implementation of community warehousing programmes to achieve 700,000 MT storage to store excess farm harvest.
Livestock	Intensification and diversification of research in livestock Breeding to ensure the availability of improved seed stock Ensure improved animal and public health Pest control services
Fishery	The government is to pursue a deliberate policy of increasing production of fish and fisheries products by 25% annually. Increase production of fish and fisheries from 3 million MT in 2010 to about 700,000 MT.
Irrigation	Irrigation of cultivable land to 10%
Extension	Training of 10,000 youths annually, nationwide, as private sector extension workers to 2013

Note: The information contained in the table are the overall goals as well as the three implementation plans (NIP).
Source: NV 20:2020 documents.

Despite some progress toward achieving the Vision 2020 goals, Nigeria's GDP ranking only improved modestly, rising from 30th to 27th position, well below the target of being among the Top-20 global economies (FMFBNP, 2021a). Data from the World Bank's World Development Indicators (WDI) database reveals that Nigeria reached US$500.23 billion. An analysis of the country's economic performance shows mixed outcomes, which partly explains why the Top-20 target was missed. While the economy grew by 7.8% in 2010, growth momentum weakened from 2015 onward, primarily due to external shocks, especially the downturn in global oil prices (FMFBNP, 2021a). Moreover, several agricultural targets were largely unmet (Section 5 provides agricultural sector performance alongside national targets).

4.2. Agricultural Transformation Agenda (ATA)

The Federal Government of Nigeria (FGN) launched the Agricultural Transformation Agenda (ATA) 2011-2015 to attract private sector investment in agriculture, reduce post-harvest losses, add value to local agricultural produce, develop rural infrastructure and enhance access of farmers and other value chain actors to financial services and markets. The main goal was to add 20 million tonnes of food to the domestic supply and to create over 3.5 million jobs by 2015 jobs along the value chains of the priority agricultural commodities of rice, cassava, sorghum, soybean, cocoa, oil palm, sorghum, tomato, onion, livestock, fisheries, etc. for Nigeria's teeming youths and women, in particular. This means accelerating the production of local food staples, reducing dependence on food imports and turning Nigeria into a net exporter of food. Nigeria no longer considered agriculture as a development programme, but as a business that can generate wealth for millions of people.

The ATA 2011-2015 primarily outlines policies, programs, and projects targeting Nigeria's agricultural and broader socio-economic development during that period. The document emphasises improving agricultural productivity, securing food and feed needs, and enhancing value addition. While its focus is not on climate change impacts and adaptation, it provides policy statements that are both directly and indirectly related to resilience-building and adaptation to climate change in agriculture. The key policy statements are provided in Table 9.

Table 9. ATA 2011-2015 climate change adaptation-related policy statements

Policy lever	Implementation	Target	
SECTOR: CROP			
Irrigation (rice)	Rehabilitate target irrigation schemes that have existing reservoir systems and require only irrigation canals and drainage canals to be developed	NA	
Fertilizer (rice)	Annual fertilizer utilisation based on identified rice varieties	Fertiliser volume:	2012: 7,000 MT 2015: 281,000 MT
Fertilizer (cocoa)	Annual fertilizer utilisation for cocoa	Fertiliser volume:	2012: 208,000 MT 2015: 217,000 MT
		Cocoa Yield:	300kg/Ha to 600kg/Ha
Fertilizer (maize)	Promotion of optimal fertilizer usage		
Farm production Innovations (maize)	Promotion of appropriate crop and resource management practices targeted to maintain the soil base and enhance agricultural productivity		
Crop development (rice)	Use of improved rice varieties	Imported variety	2012: 11,000 MT 2014: 109,000 MT
		Domestically produced	2014: 30,000MT 2015: 152,000 MT
Crop development (cotton)	Use of improved cotton varieties (BT)	Fertiliser volume:	2011: 27,000 MT 2015: 70,000 MT
		Yield	2011: 3,000 MT 2015: 7,000 MT
		Area:	2015: 350,000 Ha
Crop development (maize)	Deployment of high yielding, stress tolerant and nutrient efficient maize hybrids and varieties	Short term production: 4.5 million MT Medium term production: 9 million MT Long term production: 20 million MT	
SECTOR: LIVESTOCK			
Animal development (beef)	Establish a National Livestock Breeding Policy that promotes technology adoption for faster growth of the industry.	Livestock Breeding Policy	
Farm production Innovations (beef)	Sustainable natural resources management and adaptation of climate change.	NA	
Animal development (dairy)	Increase in dairy production from adoption of improved production technologies (genetically improved animals, animal health care and other extension services).	Dairy production:	2011: 469,000 MT 2015: 1.1 million MT
		Dairy productivity:	2011: 0.5 litres of milk/cow/day to 2014: 2 litres of milk/cow/day and above

Policy lever	Implementation	Target
Poultry development	Exploit the improved commercial layer hybrid strain (Shika Brown Layer) developed by the National Animal Production Research Institute, Shika, Zaria to meet 50% of the GPS and PS requirement of the industry.	Injecting 270,000 Grand Parent Stock (GPS) and 40,000,000 Parent Stock (PS) from Shika Brown Layer and other sources into the industry between 2012 and 2015
SECTOR: CROSS-CUTTING		
Extension service	Put in place a legislated, multi-plural, responsive, and market-oriented extension system	Establishment of the Federal Department of Agricultural Extension (FDAE) to oversee, monitor and provide the leadership needed for an efficient and effective agricultural extension and advisory service delivery in Nigeria

Note: The fisheries sector plan goal of the Transformation Agenda is to create an enabling environment for the increased and sustainable production of over one million metric tonnes of aquaculture fish through value chain development and linkages. There is no mention of any climate- or adaptation-related issues. NA means that the information is not available.
Source: Agricultural Transformation Agenda (FMARD, 2011).

The ATA recorded some achievements related to CSA during the 2011-2015 implementation period; its main achievement was in the restructuring of the federal fertilizer procurement system. Table 10 presents a summary of some of the key successes of the ATA (FMARD, 2016).

4.3. National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN)

Nigeria has acknowledged the significant importance of climate change adaptation and, in response, developed the National Adaptation Strategy and Plan of Action on Climate Change (NASPA-CCN). This strategy serves as a comprehensive roadmap for addressing the impacts of climate change while delineating the roles and responsibilities of national, state, and local governments (BNRCC, 2011; Onyeneke *et al.*, 2020).

The central objective of the NASPA-CCN is to "minimise risks, improve local and national adaptive capacity and resilience, leverage new opportunities, and facilitate collaboration with the global community, all to reduce Nigeria's vulnerability to the negative impacts of climate change" (BNRCC, 2011b). By fostering collaboration and enhancing resilience, the NASPA-CCN aims to safeguard the well-being of Nigerians and enable sustainable development in the face of growing climate-related challenges. The Plan of Action identifies 13 priority sectors most affected by climate change in Nigeria, with agriculture (encompassing crops and livestock) being one of the key sectors. Through targeted actions, the NASPA-CCN seeks to reduce vulnerabilities, enhance resilience, and promote the sustainable well-being of all Nigerians, ensuring the country is better prepared to adapt to the challenges posed by climate change (BNRCC, 2011b). Table 11 presents the NASPA-CCN recommendations for enhancing adaptive capacity and resilience in Nigeria's agricultural sector.

Table 10. Selected ATA achievements (2011–2015) by Value Chain Stage

AREA	KEY SUCCESSES
INPUT SUPPLY	• Setup of the Growth Enhancement Scheme (GES) to register smallholder farmers and provide targeted input subsidies ° GES database contains 10.5 million farmers ° Targeted means-based subsidies provided to about 12 to 14 million farmers between 2011–2014 • Farmers gained improved access to inputs, i.e., access to fertilizer and seeds
FINANCING	• Set up of NIRSAL credit guarantees in partnership with Central Bank and Bankers Committee • Revival and partial ₦15 billion recapitalisation of Bank of Agriculture (BOA) • Engagement with commercial banks to finance GES and boost lending to agriculture from ~1% to 6% of all formal credit by 2015 • Creation of special funds to support farmers, e.g., ₦10B Cassava Fund and FAFIN/KfW Facility of $35M
INFRASTRUCTURE & LOGISTICS	• Designation of staple crop processing zones; 1st site in Kogi for cassava production remains under development • Concession of Federal warehouses and storage assets
PRODUCTION	• Introduction of new higher-yielding crop varieties, e.g., Cocoa, Rice (Faro 42 and 44) • Domestic food production rose by an incremental 20.1M tons (claims not evidence-based) ° Rice paddy production rose an estimated 2.0–2.5 million tons • Rice paddy production rose an estimated 2.0–2.5 million tons • Creation of a Federal Department of Agricultural Extension
MARKET ACCESS	• Reestablishment of select commodity marketing boards, e.g., Cocoa Marketing Corporation
OTHERS	• Reform of the Agricultural Research Network (ARCN)

Source: Agriculture Promotion Policy (FMARD, 2016).

Table 11. NASPA-CCN recommendations for Nigeria's agriculture (crop and livestock)

ADAPTATION STRATEGY	TARGET
Develop and roll out a programme to improve availability and farmer access to short- and long-range weather forecasts.	NA
Private sector seed companies should work to develop and supply new seed varieties that are adapted to a changing climate e.g., • Early maturing, • Drought- and pest-resistant	
Identify environmentally sound and sustainable opportunities to improve and extend irrigation for crops and water supply for livestock: • Rainwater harvesting, • Drip irrigation	NA
Private sector entities should explore accessing carbon credit markets, which reduces adaptation costs, for adopting improved soil management and agroforestry	NA
Federal support for a State-led extension programme addressing climate change adaptation	Agricultural Extension Services for Climate Change Adaptation Programme

ADAPTATION STRATEGY	TARGET
Stimulate and support CSO and private sector involvement in the provision of insurance and access to finance for small scale farmers vulnerable to climate change, to enable then to adapt their farming practices.	NA
To support climate change adaptation at the community level, including support for community-selected initiatives.	Community-based Climate Change Adaptation Support Programme
Higher education institutions should expand agriculture research programmes related to adaptation	
CSOs and NGOs should undertake public awareness and education programmes in climate change adaptation	

Note: NA means that the policy's target information is not available. The NASPA-CCN is undergoing a review/update.
Source: National Adaptation Strategy and Plan of Action on Climate Change in Nigeria (NASPA-CCN) (BNRCC, 2011b).

4.4. Nigeria Climate Change Policy Response and Strategy (NCCPRS)

The Nigerian Government acknowledges that without a robust and well-implemented response strategy, climate change poses a significant threat to the nation's sustainable development. It has the potential to disrupt efforts to reduce poverty, create jobs, improve access to sustainable energy, and enhance the socio-economic well-being of citizens as outlined in Nigeria's Vision 20:2020. In response to these challenges, the government developed the National Climate Change Policy Response and Strategy (NCCPRS) in 2012 to provide a strategic framework for addressing climate change impacts at all levels of governance (DCC, 2012).

The vision of the NCCPRS is to establish a climate-resilient Nigeria capable of achieving rapid and sustainable socio-economic development. Its mission is to strengthen national efforts to adapt to and mitigate climate change through a participatory approach that includes all sectors of society, particularly vulnerable groups such as women, youth, and the poor. These efforts aim to advance sustainable socio-economic development across Nigeria.

The NCCPRS outlines a specific agricultural policy thrust to address the sector's vulnerability to climate change while enhancing productivity for food security and poverty reduction. The agricultural policy seeks to ensure the sustainable development of crop production, fishery, and livestock sectors, addressing challenges posed by climate change and resource scarcity. In crop production, the focus is on enhancing self-sufficiency and sustainability to reduce reliance on imports, improve yields, and combat land degradation. The fishery sector prioritizes sustainable resource management and resilience to climate variability, aiming to meet increasing domestic demand for fish protein. Meanwhile, the livestock policy emphasizes adapting to variable climatic conditions, addressing the vulnerability of grazing lands, and ensuring sustainable livestock production to meet growing demand. Collectively, these strategies (listed in Table 12) aim to build a resilient agricultural sector that supports food security and economic stability in Nigeria.

Table 12. Agricultural adaptation policy thrusts of the NCCPRS by sub-sector

Adaptation strategy	Target
SECTOR: CROP	
Adopt scientific and technological innovations to minimize climate risks, including • Development and use of drought-tolerant, and pest and disease-resistant crop varieties. • Promotion of conservation agriculture for sustainable livelihoods.	NA
Promoting sustainable irrigation agriculture and adapting existing systems to use and re-use of water more efficiently.	NA
Expanding water harvesting practices and drainage systems across the country.	NA
Rapidly improving farm management practices including e.g. • Crop and pasture rotations, • Adjustment of planting dates suitably to 'new' climate regimes, • Managing crop residue, • Using organic matter in soils, • Appropriate utilization of organic pesticides and fertilizers, • Precision farming etc.	NA
Expand accessibility of farmers to irrigation water to enhance all-year-round farming and reduce reliance on rain-fed agriculture.	NA
Encourage the use of fiscal measures to improve returns and reduce investment risks in food cropping.	NA
Support existing regulatory frameworks for innovative agricultural financing, insurance, etc.	NA
Review and strengthen climate information systems to provide early warning in a manner useful to the local farmers.	NA
Strengthen the capabilities of Extension Services providers in training farmers in best practices including the use of weather and climate data.	NA
Addressing land degradation through proven techniques, appropriate technologies and regulatory measures.	NA
Strengthen on-going initiatives to diversify into value-adding agricultural activities.	NA
Enlarge the national food storage system to secure surplus harvests.	NA
SECTOR: LIVESTOCK	
Promote the breeding of animals from various ecological zones that are adaptable to the 'new' climate regime.	NA
Incentivize the diversification of livestock into farming systems; and promote semi-intensive livestock management.	NA
Encourage de-stocking to reduce pressure on grazing lands.	NA
Initiate or support rangeland enrichment with fast-growing herbs/shrubs.	NA
Disseminate through Extension Services best practices for livestock management under uncertain conditions.	NA
Develop and implement special livestock insurance schemes for livestock farming.	NA
Make information from Early Warning Systems on droughts, floods and disease outbreaks accessible to livestock herdsmen and women.	NA

Adaptation strategy	Target
Strengthen efforts to continue to build mutual trust and understanding between farmers and herdsmen to foster desirable interaction between the two.	NA
Continue to promote the establishment of fodder banks and conserved feeds (hay, silage, etc.).	NA
SECTOR: FISHERY	
Strengthening existing efforts to assure accessibility of fish farmers to hardier, high-yielding and early maturing species and varieties of fish.	NA
Enhancing the adoption of innovative technologies for water re-use, and efficient storage for culled fish.	NA
Strengthening existing initiative to provide access of fisher-folks to productive assets including micro-credits to enable them to adopt sustainable fishery management practices.	NA
Reviewing and strengthening the implementation processes of the existing policies on the fishery to make them respond to the challenges of uncertain climatic conditions which would affect water availability.	NA
Strengthening the existing initiative to provide access of fisher-folks to productive assets including micro-credits to enable them to adopt sustainable fishery management practices.	NA
Monitor large scale fishing activities in international waters to ensure compliance to international and national regulations.	NA
Continuing to effectively protect wetlands, water bodies, rivers and streams from further pollution, encroachment by settlements and farming as well as controlling their infestation by aquatic weeds using regulatory measures.	NA
Strengthen research and development in aquaculture.	NA

Note: NA means that the information is not available.
Source: NCCPRS (DCC, 2012).

4.5. Great Green Wall for the Sahara and Sahel Initiative (GGWSSI) and the National Agency for the Great Green Wall (NAGGW, 2024)

The Great Green Wall for the Sahara and Sahel Initiative (GGWSSI), launched in Nigeria in 2013, focuses on combating land degradation, drought, desertification, and other climate change impacts. The initiative aims to improve the livelihoods of affected communities, alleviate poverty, and enhance resilience to climate change. Spanning from Djibouti to Senegal, the initiative involves 11 countries: Djibouti, Eritrea, Ethiopia, Sudan, Chad, Niger, Nigeria, Mali, Burkina Faso, Senegal, and Mauritania.

By 2030, the GGWSSI seeks to achieve ambitious goals, including the restoration of 100 million hectares of degraded land, the sequestration of 250 million tons of carbon, and the creation of 10 million green jobs. These efforts are expected to transform Africa's drylands from a source of vulnerability into a driver of livelihoods, providing opportunities to improve the lives of millions suffering from poverty and the climate crisis. Furthermore, the initiative aims to address migration and conflict cycles prevalent in the Sahel region, among other positive impacts.

In Nigeria, the National Agency for the Great Green Wall (NAGGW) was established by an Act of Parliament in 2015 to advance the GGWSSI's vision. At the national level, member states have set up GGW agencies or focal points to oversee and coordinate priority actions. In Nigeria, the implementation of the programme focuses on 11 northern frontline states: Adamawa, Borno, Bauchi, Gombe, Jigawa, Kano, Katsina, Zamfara, Sokoto, Kebbi, and Yobe.

Table 13. NAGGW's activities related to agricultural climate change adaptation

ADAPTATION STRATEGY	TARGET
Restoration and rehabilitation of degraded lands via afforestation and reforestation initiatives.	NA
Sand dune stabilization to protect agricultural lands and infrastructure.	NA
Farmer-managed natural regeneration to improve agricultural, forested, and pasture lands by promoting the regrowth of existing trees and self-sown seeds.	NA
Advancement of dryland agriculture to strengthen food security and rural economic stability.	NA
Water resource management to mitigate the effects of drought and promote irrigation practices.	NA
Community sensitization and awareness campaigns to mobilize rural populations in support of the programme.	NA
Promotion of alternative livelihoods to reduce dependency on natural resources, enhance rural economies, and create employment opportunities.	NA
Community sensitization and awareness campaigns to mobilize rural populations in support of the programme.	NA
Rehabilitation of oases to enhance food security and support livelihood activities.	NA
Establishment of fodder farms to minimize overgrazing, improve livestock productivity, increase rural incomes, and reduce conflicts between farmers and herders.	NA

Note: NA means the information is not available.
Source: NAGGW, (2024)

The NAGGW's mandate is pursued through the following key components related to agricultural climate change adaptation strategies/activities listed in Table 13.

Through these strategies, the NAGGW strives to achieve its objectives of environmental restoration, climate resilience, and socio-economic transformation in Nigeria's northern region.

4.6. National Agricultural Resilience Framework (NARF) 2014

Launched in 2014, the National Agricultural Resilience Framework (NARF) was developed by the Federal Ministry of Agriculture and Rural Development (FMARD) to support the 2011 Agricultural Transformation Agenda (ATA) and strengthen Nigeria's capacity to effectively respond to the challenges posed by climate change. This initiative aimed to establish a roadmap for implementing climate-resilient agriculture through innovative agricultural production strategies and risk management mechanisms that promote resilience within the agricultural sector. In 2013, FMARD initiated the process by convening the Advisory Committee on Agricultural Resilience in Nigeria (ACARN), which comprised leading experts in climate impacts, agricultural systems, and global food security. The committee's role was to provide informed recommendations based on research and expertise, shaping policies to enhance the capacity of small- and large-scale agricultural producers to improve productivity, generate wealth, and thrive amidst increasing environmental stressors and a changing climate.

The strategic objectives of NARF are broad and targeted at enhancing resilience and adaptation in agriculture. These include strengthening the overall policy and institutional framework to address climate variability and change. This involves improving planning, implementation, resource mobilization, and project monitoring and evaluation systems. Additionally, NARF focuses on introducing risk transfer and management strategies, such as seasonal and real-time weather forecasts and insurance-based risk mitigation options, to the agriculture sector. These strategies are to be widely disseminated through communication technologies, including mobile phones, to maximize their reach and impact.

Another key objective is to improve agricultural productivity by training communities and farmers on effective land and water management strategies, such as irrigation, water harvesting, soil fertility enhancement, and erosion control. NARF also promotes improved farming practices supported by policy instruments, including economic incentives, regulations, and communication. Furthermore, the framework emphasizes the reinforcement of social safety nets to reduce vulnerability and enhance the livelihoods of marginalised groups, especially women and children.

NARF seeks to strengthen farming systems research capacity within the National Agricultural Research Systems (NARS) to enable the implementation of climate-smart agriculture (CSA) across Nigeria. This involves researching adaptive practices and technologies to support sustainable agricultural growth. Additionally, the framework prioritises the revitalisation of extension services, focusing on building capacity for evidence-based assessments and the management of climate risks. By achieving these goals, NARF aims to prepare Nigeria's agricultural sector for future climate challenges while promoting resilience and sustainable development.

Table 14 presents NARF's proposed actions that can be taken by government, the private sector, NGOs and CBOs to expedite the shift to climate-resilient agriculture in Nigeria.

Table 14. NARF's agricultural adaptation actions

Adaptation strategy	Target
SECTOR: CROP	
Supplying and adopting drought- or disease-resistant, salt-tolerant, and early maturing crop varieties.	NA
Advancement in weather data management and forecasting, including decentralized weather forecasting and mobile dissemination.	NA
Shift the sowing or planting date (one month earlier or later than the traditional date) based on improved weather forecasts.	NA
Entrenching a credit and insurance culture in agricultural communities.	NA
Enhancing agricultural extension services to improve farm productivity.	NA
Increasing crop storage facilities and promoting agro processing to reduce post-harvest losses.	NA
Adopt an ecosystem approach to agricultural adaptation measures and practices.	NA
SECTOR: LIVESTOCK	
Introducing a range of livestock management activities to reduce climate stress while maintaining high productivity, including investments in pastoralism and grazing reserves, as well as a move to more sedentary livestock management systems.	NA
Entrenching a credit and insurance culture in agricultural communities.	NA
Enhance rainwater harvesting and conserve feed through haylage, residue processing, and conservation.	NA
SECTOR: FISHERY	
Developing aquaculture value chains, including promoting mariculture (cultivating organisms in the open ocean).	NA

Expansion of aquaculture through cage culture fish farming.	NA
Exploitation of under-used fish resources in the Nigerian offshore waters.	NA
SECTOR: CROSSCUTTING	
Promote indigenous practices for sustainable water use in agriculture.	NA
Increase the area of cultivated land under irrigation.	NA
Reduce water used in irrigation by changing the cropping calendar, crop mix, irrigation method and areas cultivated.	NA
Deployment of early warning systems and effective delivery of accurate and timely weather forecasts.	NA
Prevent encroachment on particularly sensitive areas, both on land and in the sea.	NA

Note: NA means that the information is not available.
Source: NARF (2014)

4.7. First Nationally Determined Contribution (NDC) 2015

Nigeria first developed its Nationally Determined Contribution (NDC) in 2015 as part of its commitment to the Paris Agreement on Climate Change. Under this original NDC, the country aimed to reduce the greenhouse gas (GHG) emissions intensity of its GDP by 20% by 2030 relative to a 2010–2014 baseline, on an unconditional basis (UNFCCC, 2015). With adequate climate finance, technology transfer, and capacity building from developed nations, Nigeria pledged to increase this reduction target to 45%. Achieving these goals would not only help stabilize global temperatures well below 2°C but also improve living standards, promote clean energy access, enhance food and water security, and bolster the nation's resilience against climate impacts. The NDC agricultural climate change adaptation actions (Table 15) flow from the 2011 National Adaptation Strategy and Plan of Action for Climate Change Nigeria (NASPA-CCN) and the 2014 National Agricultural Resilience Framework (NARF).

Table 15. Nigeria NDC agricultural adaptation commitments

ADAPTATION STRATEGY	TARGET DATE
Increasing access to drought-resistant crops and livestock feeds.	2030
Providing early warning/meteorological forecasts and related information.	
Adopting better soil management practices.	
Adopt improved agricultural systems for both crops and livestock: For example, by diversifying livestock and improvement of range management.	
Providing early warning/meteorological forecasts and related information.	
Increase in the use of irrigation systems that use low amounts of water.	
Increase in rainwater and sustainable groundwater harvesting for use in agriculture.	
Increase in planting of native vegetation cover and promotion of re-greening efforts.	
Promotion of crop and livestock production in place of slash-and-burn practices.	
Focus on agricultural impacts in the savanna zones, particularly in the Sahel.	

Note: The NDC commitments are until 2030, albeit updated every five years.
Source: Sectoral action plans for Nigeria's Nationally Determined Contribution (DCC, 2017).

4.8. Agriculture Promotion Policy (APP) 2016-2020

In 2016, the Agriculture Promotion Policy (APP, also known as the Green Alternative) was launched and has since continued to guide the development initiatives in the sector. It strives to consolidate the successes of the ATA, close the policy gaps and reposition the sector for greater investment and increased diversification to accelerate economic recovery, reduce poverty and enhance food security (FMARD, 2016).

The APP is centred on critical goals such as achieving food security, ensuring the right to food, reducing import dependence, generating employment, and supporting economic diversification. Key objectives include advancing agribusiness, achieving self-reliant food security through sustainable growth, strengthening research and innovation in priority areas, and effectively sharing findings. The policy also highlights the importance of climate-smart agriculture, improving agro-technology standardization, and enhancing access to local and global markets for agricultural products.

It aims to work with key stakeholders to build an agribusiness economy that can deliver sustained prosperity by meeting domestic food security goals, generating exports, and supporting sustainable income and job growth. It will achieve these objectives by focusing on three areas: enhancing productivity, crowding in private sector, and realigning the Federal Ministry of Agriculture and Rural Development (FMARD) (Table 16).

Table 16. Agricultural Promotion Policy (APP) agricultural adaptation strategies

Adaptation lever	Adaptation strategy	Target
POLICY FOCUS: PRODUCTIVITY ENHANCEMENTS		
Soil Fertility	• Crop rotation to improve nitrogen fixation • Soil fertility reconstruction and formal fallow periods • Fertilizer quality control • Use of organic fertilizer • Erosion control measures e.g. Tree planting • Soil/crop specific fertilizer formulation • Improved conservation, reforestation and green belt policies	• Rises in farm productivity versus base year (% yield increases), • Reductions in post-harvest losses, • Share of agricultural input used in Nigeria by CPG companies, • Share of fresh goods sold in formal markets.
Access to Information and Knowledge	• Disseminating information designed to help farmers make best choices with respect to agronomic practices and weather	
Access to Inputs	Crop: • Stimulating domestic production of good quality inputs, especially seeds and fertilizer • Encourage effective fertilizer use Livestock and poultry: • Policy to enhance availability of improved breeds, access to finance and information about improved production methods Fishery and aquaculture: • Promote availability of pest and disease control services	
Production Management	Water/ Irrigation Systems • Revitalizing existing, and development of new, small (earth) dams, tube wells and wash bores. • Facilitating optimization of the utilization of existing large dams for irrigation.	

Adaptation lever	Adaptation strategy	Target
	• private sector investment in irrigation and irrigation systems, including fee for service providers • Promoting water conservation by harvesting run-off water and reducing desertification by tree planting etc. Pest & Disease • Promoting organic pesticides • Integrated pest management and control mechanisms	
Storage, Processing, marketing & trade	Policy to enhance finance, information and availability of proper methods for safe and effective storage and post-harvest handling	
POLICY FOCUS: CROWDING IN PRIVATE SECTOR INVESTMENT		
	Access to finance: • Policy to enhance availability of credit and savings for all farmers and agribusiness	• Lower cost of financing and a greater availability of such financing as measured by cost of capital (%) paid, • Number of loans issued versus overall credit provision, • Levels of private capital formation, and • The number of participants in the sector.
POLICY FOCUS: FMARD'S INSTITUTIONAL REALIGNMENT		
	Climate Smart Agriculture: • Boosting public awareness through advertising of the importance of climate-smart agriculture • The management of land, water, soil and other natural resources will be improved • Government will facilitate a soil map to improve land use and management practices • Government will increase the adoption of global best practices on climate change, including the aspects of adaptation, mitigation and carbon credit	• The target outcome is a more engaged agribusiness market space and ecosystem as measured by ease of doing business in the sector.

Source: Agriculture Promotion Policy (FMARD, 2016)

The policy has been instrumental in driving self-sufficiency in rice production and processing, strengthening poultry farming, and fostering various agricultural value chains, in addition to enhancing rural infrastructure (FMARD, 2022). Nevertheless, it has not substantially increased agricultural productivity or drawn significant investments. A key factor behind this shortcoming is the inadequate adoption of vital technologies and expertise necessary for raising productivity and reducing food costs.

The situation is further exacerbated by a lack of coordinated implementation, stemming from conflicting interests among different government agencies and overlapping responsibilities. Other contributing factors include limited private-sector and stakeholder participation, low administrative capacity, and insufficient synergy among research institutions, extension services, training initiatives, and farmers.

4.9. National Water Resources Policy (2016)

The National water resources policy reports that climate change uncertainty results in prolonged droughts, increased flooding, widespread erosion and communal conflicts (FMWR, 2016). The policy cited specific cases. For example, the policy document reports that Lake Chad has shrunk by over 92% (from 27,000 km² to 1,800 km²) from 1963 to 2011. It further notes that the shrinking of Lake Chad has deprived thousands of a means of livelihood in the North Eastern part of Nigeria and has created ghost-towns from former fishing villages. Furthermore, it reports that the Sahara Desert is increasing its land mass at a pace of 0.6 km² per year or 350,000 hectares of farmland is being desertified annually thereby forcing farmers to migrate to other places resulting in tension between communities on the use of the limited resources in the area. The agricultural adaptation-relevant aspect of the water policy is documented under the response to flood, drought, and climate change.

Its policy objective is to manage the nation's water resources with a view to ensuring disaster reduction - floods and drought management - environmental conservation and incorporating future climate swings into development planning. The specific strategies include:

- Incorporate climate screening and proofing into all water resources infrastructural development.
- Develop more small-scale earth dams for expanded storage of raw water as adaptation strategy for water conservation, flood management and integrated water management
- Invest in programmes to upgrade canals and storage infrastructures to improve water conveyance, river training, and to reduce water losses.
- Improve structural and non-structural flood and drought management
- Promote integrated catchment management approach for water resources conservation, planning, including rainwater harvesting, towards strategic adaptation at community levels.
- Improve drainage facilities in the southern parts of the country and water retention mechanisms in the north to check flooding, erosion and droughts.

4.10. Economic Recovery and Growth Plan (ERGP)

The Economic Recovery and Growth Plan (ERGP), a medium-term strategy covering 2017–2020, was developed to restore economic growth in Nigeria while harnessing the resilience and ingenuity of its people. Building on the Strategic Implementation Plan (SIP) for the 2016 Budget of Change, the ERGP envisions sustained inclusive growth, promoting national prosperity through a dynamic, self-reliant economy grounded in social justice and equality of opportunity. The plan focuses on structural transformation, emphasizing increased productivity and sustainable diversification, with food and energy security as foundational priorities. To achieve these goals, the ERGP focuses on stabilizing the macroeconomic environment and diversifying the economy by prioritizing key growth-enabling sectors, particularly agriculture.

The ERGP projects real GDP to recover from a contraction of -1.54% in 2016 to a growth rate of 2.19% in 2017 and further expand to 7% by 2020. This growth is anticipated to be driven by a fiscal stimulus supported by an increase in oil production, higher oil prices, improved non-oil revenues, and a resolution of joint venture cash call arrears. Additionally, non-oil sectors such as agriculture, manufacturing, services, and light industries will play a significant role in achieving overall GDP growth.

The ERGP sets clear policy objectives for agriculture, including increasing agriculture's GDP contribution from ₦16.0 trillion in 2015 to ₦21.0 trillion by 2020, with an average annual growth rate of 6.92%. Agricultural growth is projected to rise steadily, starting from 4.69% in 2016, increasing to 5.03% in 2017, 7.04% in 2018, 7.23% in 2019, and reaching 8.37% in 2020. Key targets include achieving self-sufficiency in tomato paste by 2017, rice by 2018, and wheat by 2020.

Another goal is to significantly reduce food imports and transform Nigeria into a net exporter of key agricultural products, including rice, tomatoes, vegetable oil, cashew nuts, groundnuts, cassava, poultry, fish, and livestock. By 2020, Nigeria aims to achieve agricultural self-sufficiency and leverage investments in the sector to promote food security, reduce inflation, and drive economic diversification. Table 17 presents agricultural sector adaptation-related activities stated in the ERGP.

Table 17. ERGP agricultural adaptation-related actions

ADAPTATION STRATEGY	TARGET
Build fertilizer supply chain capacity to provide blended fertilizer specific to local soil characteristics instead of using standard mixes.	NA
Encourage research to support agriculture productivity.	NA
Strengthen the research capacity of the Research Council of Nigeria.	NA
Promote research grants in agricultural universities.	NA
Facilitate access to inputs (e.g., fertilizer).	NA
Set up a one-stop shop for small farmers and commercial farms (one per Local Government) to encourage the use of • High-yield and • Disease-resistant seedlings.	NA
Fast-track the development and execution of irrigation projects (e.g., Hadejia, Adani).	NA
Enhance agricultural extension services, including through N-Power programmes, from the current ratio of 1:3,000 to 1:1,000 by 2020.	1:1,000 farmer-to-extension ratio achieved by 2020.
Improve access to finance.	NA
Enhance agricultural extension services, including through N-Power programmes.	NA
Use irrigable land and river basin infrastructure effectively to enable year-round agricultural production.	NA
Open a minimum of 100,000 hectares of irrigable land through the 12 River Basin Development Authorities by 2020.	100,000 hectares of irrigable land opened by 2020.
Expand the use of dams for commercial farming and aquaculture.	NA

Note: NA means that the information is not available / Source: ERGP (FMBNP, 2017)

4.11. National Livestock Transformation Plan (NLTP) 2019-2028

Nigeria's population is projected to surpass 250 million by 2030, heightening the urgency to modernize critical sectors of the economy to generate jobs, increase household incomes, and promote social stability. Recognizing agriculture as a pivotal driver of economic diversification, past national policies such as the Economic Recovery and Growth Plan (ERGP, 2017–2020) and the National Development Plan (NDP, 2021–2030) have emphasized its importance. Within this context, the Agriculture Promotion Policy (APP, 2016–2020) highlights the livestock sector as a significant contributor to agricultural growth. Modernizing and transforming livestock systems is therefore seen as a crucial strategy to meet rising nutritional demands while advancing the government's agricultural development objectives.

Despite these initiatives, the livestock sector faces systemic inefficiencies that hinder its potential. Much of Nigeria's beef and milk production is dominated by pastoralists employing traditional, small-scale methods. These practices, combined with inefficient supply chains, limit the integration of livestock products into industrial value chains. Furthermore, nomadic livestock systems are increasingly under pressure due to climate change-induced overgrazing, desertification, and declining pasture availability. These challenges have led to increasing conflicts between pastoralists and crop farmers, creating a critical need for policy interventions to modernize the sector.

In response to these challenges, the National Livestock Transformation Plan (NLTP) was developed in 2019 by the Federal Government of Nigeria following a consultative process led by the Federal Ministry of Agriculture and Rural Development (FMARD, 2019). The NLTP notes that the movement of cattle in Nigeria is facing serious challenges linked to, among others, the spread of rain-fed & riparian agriculture and climate change. Thus, given the increasing impacts of climate change on agricultural systems, the NLTP incorporates key measures to build resilience and promote adaptation in the livestock sector. These are presented in Table 18.

Table 18. National Livestock Transformation Plan (NLTP) policy aspects relevant to climate change adaptation

ADAPTATION STRATEGY	TARGET
Development of systems that integrate access to land, water, and feedstocks, enhancing resilience against resource scarcity caused by climate change.	NA
Encouraging commercial fodder production to address feed shortages exacerbated by drought and the degradation of pastures due to climate impacts.	NA
Investing in disease control and management to mitigate the effects of climate-sensitive livestock diseases. Training livestock farmers on sustainable practices to adapt to changing climatic conditions.	NA
Improving land and water productivity to maximize resource efficiency amid shifting climatic patterns.	NA
Ensuring the provision of veterinary and breeding services to maintain livestock health and productivity under environmental stressors	NA
Addressing resource-based conflicts between pastoralists and farmers, which are often intensified by climate change impacts such as shrinking grazing lands and water scarcity.	NA

Note: NA means the information is not available.
Source: FMARD (2019)

4.12. Nigeria Economic Sustainability Plan (NESP)

The Nigeria Economic Sustainability Plan (NESP), launched in 2020 by the Federal Government, was designed as a response to the triple shocks of the COVID-19 pandemic, a sharp decline in global crude oil prices, and escalating social conflicts (Budget Office of the Federation, 2020). Approved in June 2020, the NESP aimed to mitigate the economic impacts of these challenges by diversifying the economy, creating and retaining jobs, and extending protections to vulnerable populations, with a long-term goal of lifting 100 million Nigerians out of poverty within a decade. A central component of this plan is the Mass Agricultural Programme (MAP), implemented by the Presidential Task Force on Food and Jobs in Agriculture, which seeks to boost agricultural production and create 5 million jobs over 12 months. The MAP project elements relevant to agricultural climate change adaptation are listed in Table 19.

With an estimated cost of ₦634.98 billion, the MAP has a defined timeline of 12 months, reflecting its urgency and scale in revitalizing Nigeria's agricultural sector.

Table 19. NESP Mass Agricultural Programme (MAP) elements relevant to adaptation

ADAPTATION STRATEGY	TARGET
Partner with the private sector to implement strategies to increase yield per hectare (e.g., through knowledge transfer protocols and greater access to energy for production).	NA
Mitigate post-harvest losses for the products through a combination of private sector off-takers, commodity exchanges, a government buy-back scheme, and strategic reserve purchases.	NA
Access to finance: explore financing options so that smallholder farmers can access interest-free credit with a small administrative charge.	NA
Partner with the private sector to implement strategies to increase yield per hectare (e.g., throughout grower schemes and knowledge transfer protocols).	NA
Increase land area per State for agricultural use.	20,000–100,000 hectares of land identified per state.
Guarantee market and mitigate post-harvest losses for the products (e.g., through private sector off-takers, commodity exchanges, a government buy-back scheme, strategic reserve purchases).	NA

Note: NA means the information is not available
Source: NESP (Budget Office of the Federation, 2020)

4.13. Climate Change Act, 2021

The Climate Change Act 2021 provides the legal foundation for achieving low greenhouse gas (GHG) emissions, promoting green growth, and ensuring sustainable economic development. Signed into law by President Buhari in November 2021, the Act marks a significant initial step by the government toward meeting its obligations under various international climate agreements. It outlines a comprehensive regulatory framework designed to fulfil long-term climate objectives, including a net-zero emissions goal, the establishment of reliable funding mechanisms, and clear standards for environmental and economic responsibility. In doing so, it empowers Nigeria to develop and implement programs aimed at both mitigating and adapting to the effects of climate change.

Under the Act, Nigeria commits to reaching net-zero GHG emissions between 2050 and 2070, aligning its national actions with global climate commitments. Notable features include the creation of a National Council on Climate Change, the introduction of a Climate Change Fund, the formulation of a carbon budget and a national climate change action plan, and the undertaking of vulnerability and risk assessments. The Act offers a framework for achieving low GHG emissions, fostering green growth, and ensuring sustainable economic progress by:

I. Ensuring that Nigeria develops programs to meet its long-term mitigation and adaptation goals for climate change,

II. Facilitating the coordination of climate-related initiatives needed to meet long-term objectives

III. Integrating climate change measures into the nation's development priorities,

IV. Mobilizing financial and other necessary resources to implement effective climate actions,

V. Aligning climate policies and actions with other related policies to advance socio-economic development and safeguard environmental integrity,

VI. Establishing a 2050-2070 timeline for attaining net-zero GHG emissions, consistent with Nigeria's international climate commitments,

VII. Identifying risks and vulnerabilities, enhancing resilience, and strengthening existing adaptive capacities to address the impacts of climate change.

4.14. Climate Change Act and National Climate Change Policy 2021-2030

Since the introduction of the National Climate Change Policy and Response Strategy (NCCPRS) in 2012, the global climate agenda has advanced, resulting in new initiatives and frameworks that have been incorporated into Nigeria's national response efforts. Reflecting these developments, the Federal Government of Nigeria updated the NCCPRS and launched the National Climate Change Policy (NCCP) in 2021 (FMEnv, 2021a). This revised policy provides a comprehensive, forward-looking framework to guide the nation's approach to addressing the developmental challenges posed by climate change.

The NCCP of 2021 is designed to foster low-carbon, climate-resilient, and gender-responsive sustainable socio-economic growth. To fulfil its international commitments, Nigeria's policy outlines specific targets and objectives aligned with the global climate agreement. Its key areas of focus include mitigation, adaptation, finance, research and development, institutional capacity building, and both global and regional cooperation. Measures to mitigate emissions span multiple sectors—from energy production (including oil and gas), agriculture, forestry, and other land use (AFOLU), to industry, transportation, and waste management. The policy also prioritizes enhancing climate resilience through strengthened early warning systems, climate-smart agriculture, and expanded access to clean and renewable energy sources.

In addition, the NCCP emphasizes the importance of robust institutional frameworks, capacity building, and innovative financing mechanisms to support climate action. These include developing the green bond market, implementing a carbon tax, and leveraging private sector engagement to mobilize resources effectively. Central to the NCCP's strategy is improving the resilience of Nigeria's agricultural systems to climate variability and change. To achieve this, the policy proposes a series of measures listed in Table 20.

By putting these strategies into practice, Nigeria's National Climate Change Policy aims to build resilient agricultural systems and drive sustainable development, ensuring that the country is well-prepared to meet both current and future climate challenges.

Table 20. NCCP 2021-2030 agricultural climate change adaptation policy

Adaptation strategy	Target
Develop and apply improved production and risk management technologies in agriculture.	NA
Increase the uptake of adaptation measures at farm and community levels.	NA
Promote efficient, gender-responsive, socially inclusive and climate-smart crop production, fishery and livestock development practices.	NA
Facilitate an enabling environment for enhanced public and private sector participation and financial investments to achieve adaptation at scale.	NA
Increase access to adaptation finance through economic incentives and value chain initiatives.	NA
Increase access to adaptation finance through economic incentives and value chain initiatives.	NA
Reinvigorate extension services, capacity building and technology transfer approaches to provide support to a wider group of farmers, including women and youth.	NA
Strengthen indigenous knowledge-based adaptation measures.	NA
Promote and support effective research and knowledge development and management to connect farmers, policymakers, businesses and researchers to adapt to dynamic current and future climate scenarios.	NA
Strengthen regulatory and institutional capacity to implement and disseminate technical solutions in adaptation to agriculture.	NA

Note: NA means the information is not available. / Source: NCCP 2021-2030 (FMEnv, 2021a)

4.15. Nationally Determined Contributions (NDC) – 2021 Update

Nigeria updated its NDC in 2021, providing a more detailed assessment of its emissions profile and strengthening its commitments—20% unconditional and 47% conditional (DCC, 2021). According to the updated NDC, the country's GHG emissions stood at approximately 347 million metric tons of CO_2 equivalent ($MMtCO_2e$) in 2018. Of this, agriculture accounted for 15.7% (86.8 $MMtCO_2e$) and the forestry and other land use (FOLU) sector contributed 9.3% (31.2 $MMtCO_2e$). The updated NDC sets a 20% reduction in Business-as-Usual (BAU) emissions by 2030 as an "Unconditional NDC" target, requiring no external support. With international assistance, Nigeria aims to achieve a more ambitious 47% reduction below BAU levels by 2030.

Adaptation priorities are also a central feature of the updated NDC, anchored in the National Adaptation Plan (NAP) framework (FMEnv, 2020a). This approach ensures that adaptation actions, strategies, and programs align with key national documents, including the National Adaptation Strategy and Plan of Action Against Climate Change in Nigeria (NASPA-CCN) and the Economic Recovery and Growth Plan (ERGP). Moreover, the NDC is harmonized with other policies such as the National Climate Change Policy and Response Strategy (NCCPRS), promoting coherence across Nigeria's climate initiatives. Through this integrated framework, Nigeria endeavours to advance both mitigation and adaptation measures that support sustainable development and long-term climate resilience.

To meet agricultural sector adaptation targets, the updated NDC emphasises **Climate-Smart Agriculture (CSA)** as a key strategy. CSA adopts an integrated approach to managing landscapes, including croplands, livestock, forests, and fisheries, and focuses on three pillars: adaptation, mitigation, and productivity.

The goal is to sustainably increase agricultural productivity while supporting equitable income growth, enhancing food security, and driving development. The approach promotes agro-ecological measures that improve the resilience of farming systems, steering away from practices reliant on high external inputs. Recognized as a high-growth sector, agriculture is essential for creating youth employment and fostering sustainable development, making CSA a cornerstone of Nigeria's climate resilience and economic diversification efforts. Box 1 provides an overview of CSA practices and technologies as described by the FAO (2010, 2013).

4.16. Nigeria Agenda 2050 (NA-2050) & National Development Plan (NDP) (2021–2025)

The Agenda 2050 is Nigeria's long-term national development plan, which replaced Vision 20:2020—the country's plan to be among the 20 most developed economies by 2020. The NA-2050 outlines the pathway to achieve accelerated, sustained, and broad-based growth. It provides broad frameworks and approaches for reducing unemployment, poverty, inequality, and human deprivation. The aim of Agenda 2050 is to reposition Nigeria as one of the leading countries of the 21st Century. It serves as the country's long-term blueprint for economic transformation, designed to overcome key developmental challenges and elevate Nigeria to upper middle-income status. The agenda targets an average real GDP growth rate of 7%, a nominal GDP of $11.7 trillion by 2050, and an end-period per capita income of $33,328 per year.

For the agricultural sector, the NA-2050 NDP outlines ambitious targets for the agricultural sector, integrating both climate change adaptation strategies and broader development goals. Specifically, the ANA-2050 advocates for climate-smart agriculture. Its key targets include increasing cereal yields from 1,509 kg per hectare in 2018 to 10,000 kg per hectare by 2050 and raising the crop, livestock, and food indices from 106.9, 103.4, 106.6, respectively, 2019 to 170, 169, and 170, respectively, by 2050. Financial inclusion is emphasized, with total credit to agriculture increasing from ₦20.4 billion in 2019 to ₦82 billion by 2050. The identified strategies linked to climate adaptation for the agricultural sector are listed in Table 21.

Table 21. Nigeria Agenda 2050 agricultural climate change adaptation strategies

- Promote sustainable agricultural mechanisation and conservation, improve timeliness in farming operations, and increase the efficiency of input use.
- Gear efforts towards promoting more innovation that leads to higher productivity growth in areas like conservation agriculture, agroforestry, integrated crop-livestock-energy systems, and integrated pest management.
- Improve irrigation infrastructure to reduce reliance on rain-fed agriculture.
- Introduce and implement desert-to-food (DTF) programme to arrest desertification as part of climate mitigation measures, the promotion of climate-smart agriculture and to serve as the economic backup to the GGW in the far northern states.
- Encourage farmers to re-introduce biological complexity, encourage climate-smart agriculture, and reemphasise 'blue growth' approaches in fisheries and aquaculture.
- Work with development partners and extension services to access relevant information, technology, and training to address current and future climate shocks.
- Promote modern livestock (ranching) and poultry industry through the NLDP and DTF.
- Strengthen agricultural research institutions and promote the activities of the Nigerian Agricultural Insurance Corporation (NAIC) with appropriate frameworks developed for the commercialisation of their research findings.
- Provide financial support to the farmers through initiatives such as the agriculture financing schemes including the Anchor Borrower's Programme (ABP).
- Partner with financial service providers and raise awareness about funding opportunities for exporters and develop tailored financing instruments.

- Work with development partners and extension services to access relevant information, technology, and training to address current and future climate shocks.
- Strengthen value chain linkages by promoting local sourcing and value addition by turning agricultural produce into manufactured goods.
- Provide financial support to farmers through initiatives such as the Anchor Borrower's Programme (ABP).
- Ensure equity, capacity building, and inclusion of women and youth in agriculture and food security.
- Raise the profile of public investment in climate change research and establish special funding arrangements for climate change adaptation.

Source: Nigeria Agenda 2050 (FMFBNP, 2021b).

The NA-2050's specific strategies, programmes, interventions, and the important task of implementation will be implemented through six five-year medium-term plans. The first medium term NDP (2021-2025) is already approved, published, and being implemented. The plan outlines strategies to enhance agricultural productivity through extensive public and private investments in technology, innovation, and climate-smart practices (FMFBNP, 2021a). The NDP builds on the foundational frameworks of earlier policies, including the Agricultural Promotion Policy (2016-2020), the Economic Recovery and Growth Plan (2017-2020), and the Economic Sustainability Plan (2020-2021).

By 2025, the NDP aims to achieve an average economic growth rate of 5%, lift 35 million people out of poverty, and create 21 million full-time jobs. Agriculture is recognized as a vital contributor to achieving these ambitious goals during the planning period. The plan's priority crop value chains cassava, rice, maize, soybean, yam, and tomatoes.

Table 22. NDP 2021-2025 objectives and targets of agriculture and food security

OBJECTIVES	KEY PERFORMANCE INDICATORS	BASELINE	TARGET
REDUCE POST-HARVEST LOSSES	The total amount of post-harvest losses from key value chains	60% of all agricultural output	30% of all agricultural output
BUILD A SUSTAINABLE FOOD PRODUCTION SYSTEM	Total arable land under cultivation	34 million hectares	42 million hectares
INCREASE AGRICULTURAL EXPORT VOLUME	Share of agricultural exports in total exports	4.37 percent	6.12 percent
INCREASE FEMALE PARTICIPATION IN AGRICULTURE	Share of women in the population of women 15 years and above	19.6%	25%
IMPROVE NATIONAL FOOD SECURITY RANKING	Increase National food security ranking to top 3 in SSA and top 50 in the world ranking	- 92 out of 104 countries - 13th of 28 countries in SSA	- Top 50 in the global ranking - Top 3 in SSA
INCREASE PRIVATE SECTOR INVESTMENT IN AGRICULTURE SECTOR	Bank credit allocation to agricultural activities/sector	5.1% of total private sector credit	10% of total private sector credit
INCREASE FOOD SELF-RELIANCE THROUGH INCREASED PRODUCTIVITY	Share of foods in total imports (%)	20%	15%

Source: NDP 2021-2030 (FMFBNP, 2021a)

Both NA-2050 and NDP 2021-2025 plans emphasise increasing agricultural productivity, reducing post-harvest losses, and fostering climate-smart practices to mitigate the impacts of climate change. The Agenda 2050 focuses on long-term targets, such as raising cereal yields, reducing forest conversion emissions, and scaling up agricultural financing and inclusion, while the NDP 2021–2025 outlines immediate actions, including leveraging production systems and technologies in priority value chains, enhancing irrigation infrastructure, and strengthening extension services and agricultural research institutions. Together, these strategies align short- and long-term objectives to build a climate-resilient agricultural sector that supports economic growth and food security. Table 22 presents an overview of the agricultural sector-specific objectives and targets of the NDP 2021-2025.

4.17. National Agricultural Technology and Innovation Policy (NATIP) (2022–2027)

The National Agricultural Technology and Innovation Policy (NATIP) (2022–2027), developed by FMARD and approved by the Federal Executive Council in May 2022, succeeds the Agricultural Promotion Policy (APP), which concluded in December 2020 (FMARD, 2022). Conceived to modernize Nigeria's agricultural sector in alignment with evolving global food systems and supply chains, NATIP builds on the achievements of previous agricultural policies. It focuses on repositioning the National Agricultural Research System, advancing holistic mechanization, providing rural infrastructure, standardizing inputs and processing systems, and developing commodity value chains through clusters and special agro-processing zones.

To ensure synergy and better coordination, NATIP operates within the broader context of related policies and strategies of other MDAs, as well as the macroeconomic planning framework provided by the National Development Plan (NDP, 2021–2025). The policy also draws inspiration from global frameworks like the Sustainable Development Goals (SDGs) and lessons learned from the Agricultural Transformation Agenda (2012–2015) and the APP (2016–2020).

NATIP adopts a 6-year implementation timeframe to drive modernization and encourage massive public and private sector investments in agriculture. Key areas related to agricultural climate change adaptation are presented in Table 23.

Table 23. NATIP climate change adaptation-related interventions

SECTOR	ADAPTATION STRATEGY	TARGET
CROP	Deploy knowledge and technology to increase yield of priority food and cash crops.	50% increase in yield of priority food and cash crops.
	Increase the size of irrigated land.	From 1% to 5% of cultivable land.
	Increase the area of land planted with diversified biomass in the agro-forestry program.	From 3.5% to 7%.
	Increase the use of fertilizers by farmers.	30% increase.
	Increase farmers' access to quality inputs.	NA
	Reduce production and post-harvest losses in food and cash crops.	By 50% by 2027.
	Increase the storage capacity of Nigerian Strategic Reserve.	From 1.3 MT to 2.0 MT by 2027.
LIVESTOCK	Promote integrated livestock development for quality and export.	NA
	Strengthen links between research institutions, extension agents, and livestock farmers.	NA

SECTOR	ADAPTATION STRATEGY	TARGET
	Rehabilitate livestock multiplication centres for breed improvement.	NA
	Reseed and rehabilitate grazing reserves.	NA
	Upgrade existing Animal Genetic Resource Centres.	NA
	Strengthen veterinary services.	NA
FISHERIES AND AQUACULTURE	Promote research and development in fisheries.	NA
	Provide support for developing alternative indigenous fish species.	At least 3 species by 2023.

Note: NA means the information is not available.
Source: NATIP (FMARD, 2022).

4.18. Long-Term Low-Emission Development Strategy (LT-LEDS) – 2060

The Long-Term Low-Emissions Development Strategy (LT-LEDS) plays a pivotal role in Nigeria's climate and development planning (NCCC, 2023a). To establish a foundation for this strategy, Nigeria initially formulated the Long-Term Vision 2050 (LTV 2050), a forward-looking plan aimed at achieving low-carbon and climate-resilient development by 2050. The LTV 2050 envisions Nigeria as a nation with a low-carbon, climate-resilient, high-growth circular economy that reduces its current emissions by 50%, progressing toward net-zero emissions across all sectors in a gender-responsive manner. The LTV 2050 encompasses key sectors such as agriculture, forestry, and other land use (AFOLU), energy, freshwater and coastal wetlands, industry, urban settlements, oil and gas, transport, and waste, as well as cross-cutting issues like gender, with each sector aligned to specific visions.

Building on this foundation, the LT-LEDS seeks to promote sustainable development and ensure climate-resilient economic growth, aligning with Nigeria's medium-term (2021–2025) and long-term (Agenda 2050) national development plans. In the AFOLU sector, Nigeria plans to adopt and scale up climate smart agricultural (CSA) adaptation technologies and practices.

BOX 1. CLIMATE-SMART AGRICULTURAL (CSA)

The Food and Agricultural Organisation (FAO, 2010) notes CSA integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. It is composed of three main pillars:

sustainably increasing agricultural productivity and incomes
adapting and building resilience to climate change
reducing and/or removing greenhouse gas emissions, where possible.

CSA helps to develop the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change. The magnitude of the effects of climate change on agricultural systems creates a compelling need to ensure comprehensive integration of these effects into national agricultural planning, investments and programs.

BOX 1. CLIMATE-SMART AGRICULTURAL (CSA) (continued)

Agricultural approaches and practices that constitute CSA in crop production

CSA Practices and Technologies	Adaptation	Mitigation	Food security
Conservation agriculture	✓	✓	✓
Mulch cropping	✓	✓	✓
Crop diversification	✓	✓	✓
Water management/conservation, irrigation, water table management	✓	✓	✓
Integrated nutrient and soil management	✓	✓	✓
Cover cropping	✓	✓	✓
Ecosystem-based approaches	✓	✓	✓
Alterations in cropping patterns and rotations	✓		✓
Using high-quality seeds and planting materials of adapted varieties	✓		✓
Integrated pest management	✓		✓
Integrated weed management	✓		✓

Agricultural approaches and practices that constitute CSA in livestock production: mixed farming systems

Broad Category	Management Objective	Practices/Technologies	Food Security	Adaptation	Mitigation
CROP AND GRAZING LAND MANAGEMENT	Improved crop varieties	Conventional breeding (e.g., dual-purpose crops, high-yielding crops)	+++	+++	Uncertain
		Modern biotechnology and genetic engineering (e.g., genetically modified stress-tolerant crops)	++	++	Uncertain
	Crop residue management	No-till/minimum tillage; cover cropping; mulching	+++	+++	++
	Nutrient management	Composting; appropriate fertiliser and manure use; precision farming	+++	++	++
	Soil management	Crop rotations; fallowing (green manures); intercropping with leguminous plants; conservation tillage	+++	+++	++
	Grazing management	Adjust stocking densities to feed availability	+++	+++	+++
		Rotational grazing	+++	+++	+++

BOX 2. CLIMATE-SMART AGRICULTURAL (CSA) (continued)

Broad Category	Management Objective	Practices/Technologies	Food Security	Adaptation	Mitigation
WATER MANAGEMENT	Water use efficiency and management	Supplemental irrigation/water harvesting	++	++	
		Irrigation techniques to maximise water use (amount, timing, technology)	++	++	

Agricultural approaches and practices that constitute CSA in livestock production: landless systems

CSA Practices/Technologies	Food Security	Adaptation	Mitigation
Anaerobic digesters for biogas and fertiliser	+++	+++	+++
Composting, improved manure handling and storage (e.g., covering manure heaps), application techniques (e.g., rapid incorporation)	++	+	++

4.19. Synthesis of agricultural sector (crop and livestock) climate change adaptation policy

The synthesis of adaptation actions across these national policies and strategies (see Table 24) reveals a strong convergence of priorities that cut across crops, livestock, infrastructure, financial mechanisms, and institutional strengthening. Nearly all documents emphasise promoting improved or stress-tolerant crop varieties, enhancing irrigation and water management, scaling up extension services, and expanding access to finance and insurance. Equally prominent are measures geared toward safeguarding soil health, controlling post-harvest losses, and modernising the sector through mechanisation and research-driven innovation. Livestock resilience features consistently, often paired with calls for integrated farming systems and climate-smart agriculture. Other themes—such as early warning systems, conflict mitigation, and alternative livelihoods—highlight the cross-cutting nature of adaptation, reflecting the urgent need for coordinated efforts that address social as well as environmental vulnerabilities. This systematic comparison indicates that, while each policy document has unique focal points, there is an overarching alignment around enhancing productivity, building resilience, and ensuring sustainable growth in Nigeria's agricultural sector under climate change. Put differently, there is broad consensus towards **climate-smart agricultural (CSA)** practices drawn from the review of the national documents. This is further exemplified by the linkage between the identified measures in the national documents and the FAO list of CSA measures (refer to the last column in Table 24).

Table 24. Synthesis of agricultural sector adaptation actions identified in national policy documents in Nigeria and link to CSA

Adaptation Measure for Crops	NV20	ATA	NASPA	NCCPRS	GGW	NARF	NDC15	APP	ERGP	NLTP	NESP	CCA	NCCP21	NDC21	A2050	NATIP	LT-LEDS	Link to FAO CSA Table
1. Expand / upgrade irrigation & water management (rainwater harvesting, drip, etc.)	✓	✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	Water management / conservation, irrigation
2. Develop / use climate-resilient seeds (drought- / pest- / disease-resistant, early maturing)		✓	✓	✓		✓	✓	✓					✓	✓	✓	✓	✓	Using high-quality seeds & planting materials of adapted varieties
3. Adjust planting dates & cropping calendars (based on forecasts)			✓	✓		✓	✓	✓					✓	✓	✓	✓	✓	Alterations in cropping patterns
4. Improve soil fertility and conservation agriculture (organic matter, erosion control, min. tillage, etc.)			✓	✓		✓	✓	✓					✓	✓	✓	✓	✓	Conservation agriculture or Integrated nutrient/soil management
5. Strengthen extension services (climate-related agronomy for smallholder crop producers)	✓	✓	✓	✓		✓		✓	✓		✓		✓	✓	✓	✓		NA (FAO list does not list "extension" directly)
6. Enhance post-harvest storage and processing (reduce crop losses)	✓							✓							✓	✓		NA (FAO tables do not mention post-harvest specifically)
7. Promote integrated pest management (reduce chemical				✓				✓					✓	✓	✓	✓	✓	Integrated pest management (IPM)

inputs, manage pests under changing climate)																		
8. Provide crop-based insurance / risk financing (weather extremes)			✓	✓		✓	✓	✓					✓	✓	✓	✓	✓	Weather-indexed insurance (FAO mentions it under livestock, but relevant)
9. Shift away from slash-and-burn / unsustainable methods in savanna & Sahel							✓						✓	✓	✓			Possibly Ecosystem-based approaches (reducing destructive practices)
10. Promote sustainable mechanization (timeliness, drudgery reduction, precision use)															✓	✓		Possibly NA or "Precision farming" (not explicitly in FAO tables)

Livestock	NV20	ATA	NASPA	NCCPRS	GGW	NARF	NDC15	APP	ERGP	NLTP	NESP	CCA	NCCP21	NDC21	A2050	NATIP	LT-LEDS	CSA Link
1. Livestock breeding and genetic improvement (e.g. improved seed stock, adopting climate-resilient breeds)	✓	✓		✓			✓	✓					✓	✓	✓	✓		Animal breeding
2. Veterinary & disease control (e.g. improving animal/public health, vaccination, prophylaxis)	✓			✓						✓			✓	✓	✓	✓		Animal disease and health
3. Improve feed & fodder production (fodder banks, silage, hay, residue processing)				✓		✓	✓			✓			✓	✓	✓	✓		Supplementary feeding (land-based) or improved feed management (mixed)

4. Rangeland management & re-seeding (restore degraded pasture, reintroduce grasses)		✓	✓				✓	✓	✓	✓		Grazing management or Pasture management
5. Shift to semi-intensive / ranching systems (reduce open grazing, manage conflicts, more sedentary)		✓		✓		✓	✓	✓	✓	✓		Grazing management/ Animal and herd management
6. Livestock insurance schemes (coverage for drought, disease, climate shocks)		✓		✓	✓	✓	✓	✓	✓	✓		Weather-indexed insurance (FAO)
7. Early warning systems (livestock) (alerts for drought, floods, disease outbreaks)		✓			✓		✓	✓	✓		✓	Warning systems
8. Integrating livestock into farming systems (diversify livestock, promote mixed crop-livestock)		✓		✓	✓		✓	✓	✓	✓		Integrated crop and livestock systems (FAO)
9. Enhance water supply for livestock (rainwater harvesting, irrigation for feed, etc.)	✓	✓		✓								Water management (mixed systems)
10. Investing in disease control (explicitly in NLTP (overlap w/ #2 but singled out in NLTP text))						✓						Animal disease and health

11. Address resource-based conflicts (reduce friction w/ farmers, water/land scarcity, etc.)										✓					✓			NA (not in FAO livestock tables)
12. Training & extension for livestock (sustainable practices, climate-smart husbandry)				✓						✓			✓	✓	✓	✓		NA (FAO tables omit extension)
13. Commercial fodder production (large-scale feed to address drought & degraded pastures (NLTP))										✓								Supplementary feeding / improved feed management

Adaptation Measure for Fisheries	NV20	ATA	NASPA	NCCPRS	GGW	NARF	NDC15	APP	ERGP	NLTP	NESP	CCA	NCCP21	NDC21	A2050	NATIP	LT-LEDS	Link to CSA
1. Sustainable aquaculture (fishponds, cage culture, hardy species)	✓		✓	✓		✓	✓		✓				✓	✓	✓	✓	✓	Possibly Water management / Ecosystem-based (not specific in FAO)
2. Efficient water use and re-use (integrated aquaculture)				✓		✓	✓		✓				✓	✓	✓	✓	✓	Water management (broadly)
3. Fisheries insurance or financial support (protect fisherfolk from climate shocks)			✓				✓						✓	✓	✓	✓		Possibly Weather-indexed insurance concept
4. Wetlands/waterbody protection and weed control (prevent pollution, encroachment)				✓									✓	✓	✓	✓	✓	Ecosystem-based approaches
5. Aquaculture R&D (mariculture, offshore							✓						✓	✓	✓	✓	✓	Possibly Animal breeding (but for fish)

fish farming, new species breeding)																		
6. Strengthen fishery extension & training (climate-smart practices, disease management, feed formulation)			✓	✓		✓		✓					✓	✓	✓	✓	✓	NA (FAO list does not mention fish extension)
7. "Blue Growth" approaches (integrated coastal / marine resource management)															✓		✓	Ecosystem-based approaches (coastal)

Forestry	NV20	ATA	NASPA	NCCPRS	GGW	NARF	NDC15	APP	ERGP	NLTP	NESP	CCA	NCCP21	NDC21	A2050	NATIP	LT-LEDS	Link to CSA
1. Afforestation / reforestation (tree planting, forest restoration)	✓		✓	✓	✓		✓		✓				✓	✓	✓	✓	✓	Ecosystem-based approaches (adding trees)
2. Farmer-managed natural regeneration & agroforestry (integrate trees into farmland)			✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	Agroforestry
3. Sand dune stabilization & shelterbelts (in desert-prone northern areas)					✓										✓	✓		NA
4. Sustainable forest management (reduce illegal logging, promote forest conservation)				✓	✓		✓						✓	✓	✓	✓	✓	Ecosystem-based approaches
5. Alternatives to wood fuel (LPG, etc.)				✓			✓						✓	✓	✓		✓	NA (no direct "fuel shift" in FAO list)
6. Integrated watershed management (protect				✓	✓								✓	✓	✓	✓	✓	Possibly Landscape-level pollination management or

forest watersheds, critical habitats)																		broader *ecosystem-based*
7. "Desert-to-Food" & Great Green Wall (arrest desertification, restore land)					✓										✓			Restoration of degraded lands

Cross-Cutting Adaptation Measures	NV20	ATA	NASPA	NCCPRS	GGW	NARF	NDC15	APP	ERGP	NLTP	NESP	CCA	NCCP21	NDC21	A2050	NATIP	LT-LEDS	Link to CSA & Relevant Sub-Sectors
1. Agricultural finance & insurance (credit, weather-index, risk transfer)			✓	✓		✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	CSA: Weather-indexed insurance (FAO) Sub-Sectors: All (crops / livestock / fish / forestry)
2. Capacity building & research (R&D, training for extension staff, farmer field schools)	✓	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	CSA: NA (FAO does not list "extension / training" directly) Sub-sectors: All
3. Early warning systems & climate info (weather data, advisories, disease outbreak alerts)			✓	✓		✓	✓	✓		✓			✓	✓	✓	✓	✓	CSA: Warning systems (FAO livestock context) Sub-sectors: All
4. Promotion of climate-smart agriculture (integrated soil, water, nutrient, GHG management)			✓	✓		✓		✓					✓	✓	✓	✓	✓	This is a general CSA umbrella concept already Sub-sectors: All
5. Mechanization and productivity (improved implements, value-chain dev, input distribution)	✓	✓						✓	✓						✓	✓		CSA: NA Sub-sectors: Primarily Crops & Livestock
6. Strengthening extension-research-farmer linkages	✓	✓	✓			✓		✓	✓	✓			✓	✓	✓	✓	✓	CSA: NA (no explicit mention in FAO's lists)

(multi-plural extension systems)															Sub-sector: All
7. Infrastructure & marketing (roads, storage, aggregation centres, marketing boards)	✓	✓				✓		✓				✓	✓		CSA: FAO's list mentions infrastructure adaptation under livestock management (e.g., housing, shade) Sub-sectors: Primarily Crops & Livestock
8. Conflict resolution and peacebuilding (reduce resource-based conflicts, e.g. farmers–herders)							✓					✓	✓		CSA; NA Sub-sectors: Livestock & Crop
9. Post-harvest management (storage, cooling, processing)	✓	✓				✓						✓	✓		CSA: NA Sub-sectors: Crops, Livestock (milk), Fisheries
10. Mainstreaming indigenous knowledge (community-led adaptation)			✓	✓	✓					✓	✓	✓	✓	✓	CSA: Sub-sectors: All
11. Strengthen policy, governance & coordination (Climate Change Act, national councils, budgets)				✓					✓	✓	✓	✓		✓	Sub-sectors: All

Note: NA mean "not available" on the FAO's CSA tables. It does not necessarily mean that the specific measures are not fall under CSA.

4.20. Adaptation Actions and Assessment of Implementation

Nigeria has implemented several adaptation actions across the nation. Key adaptation actions reported in Nigeria's Initial Adaptation Communication to the UNFCCC (Federal Republic of Nigeria, 2021) and Long-Term Low Emissions Development Strategy (NCCC, 2023a) documents are presented in Table 25.

At the agro-ecological zone level, certain adaptation practices—relevant to CSA—have been identified across the country (Nwajiuba *et al.*, 2015). These are presented in Table 26.

Nigeria's Initial Adaptation Communication to the UNFCCC in 2021 reports that there is no formalized or systematic approach to assessing, monitoring, reviewing, or reporting on ongoing adaptation efforts at all government levels in the country (i.e., federal, state, or local) (Federal Republic of Nigeria, 2021).

Table 25. Nationally reported agricultural climate adaptation actions

Implementing entity & Adaptation actions	
Federal Ministry of Agriculture and Rural Development (FMARD) • Agriculture and Rural Institutions Support Projects • Development of climate-smart crop varieties • Improving access to climate-smart technology • West Africa Agricultural Productivity Program (WAAPP) • Innovate, generate, disseminate, and adopt improved technology • Build human and institutional capacity across the sub-region • Create youth employment, engage women and adapt to climate change. • Climate Smart Agricultural Programmes • Improved drought-tolerant seeds • Developed efficient irrigation systems • Developed agroforestry systems • Developed sustainable livestock programme • Establishment of Automatic Weather Stations. • Run-off Water Harvesting Structures. • Climate Change Adaptation and Agricultural Business Support Programme. • Agricultural risks profile in Nigeria • Collaboration with Federal Ministry of Environment on Capacity Development on relevant areas of GHG Emission (Reporting, Calculation, funding etc.) • Collaboration with NEPAD Coordinating Agency through TerrAfrica on the Review/Update of Nigeria Country Investment Framework (CSIF – SLM), Cross River pilot • Review of National Agricultural Resilience Framework (2014) document. • Production of NARF Implementation manual. • MOU with Nigerian Meteorological Agency (Nimet)	**Federal Ministry of Environment** • The Great Green Wall Project • Action Against Desertification Project • Adaptive water harvesting programme. • Flood Early Warning Systems (FEWS) • Various afforestation projects • Sand dune fixation • Establishment of trees nurseries • Training on climate change adaptation • Ecosystem Restoration Projects • Advocacy campaign • Funding and support for adaptation actions. • Climate resilience building activities • Pollution control projects • Flood and erosion control • Climate-smart drainage systems • Land/gully reclamation projects • Space Programme on Climate Resilience

Note: Several ministries, departments, and agencies (MDAs) report adaptation actions. For brevity, this table presents only those two primary ministries with adaptation actions directly or indirectly relevant to the agricultural sector.

Source: Nigeria's Initial Adaptation Communication to the UNFCCC (Federal Republic of Nigeria, 2021) and Long-Term Low Emissions Development Strategy (NCCC, 2023a).

Table 26. Agricultural adaptation practices identified in various AEZs in Nigeria

AEZ	ADAPTATION PRACTICES
COASTAL	- Adjusting of planting dates. - Use of drought resistant varieties, - Planting of cover crops to increase soil fertility e.g. legumes. - Incorporation of residues or other mulches (reduces wind and soil erosion, increases water retention, and improves soil structure and aeration) - Use of drought resistant varieties, - Use of improved varieties tolerant to climate change stressors e.g. rice and maize hybrids. - Use of salt-tolerant Varieties (e.g. Ex-Dakar cultivar of groundnut).
RAINFOREST	- Use of drought resistant varieties, - Use of improved varieties tolerant to climate change stressors e.g. rice and maize hybrids. - Use of salt tolerant varieties (e.g. Ex-Dakar cultivar of groundnut). - Reduced tillage. - Mixed farming practice e.g. Poultry, fishpond and crop farming. The poultry dung serves as feed for the fish while the polluted pond water serves as manure for the crops. - Planting of cover crops to increase soil fertility e.g. legumes. - Crop residue management: increases soil organic matter content, water retention and improves soil structure and aeration. Mulching protects against wind and soil erosion
SAVANNAH	- Rainwater harvesting, - Run-off water harvesting, - Use of Fadama land (wetland), - Resort to irrigation - Rearing of improved breeds of livestock e.g. white coloured sheep was identified to control heat stress - Rotational Grazing, Stocking density management (e.g. herd size/land area), - Improved feed management (higher feed quality), - Use of industrial by-products and livestock feed, use of ethno-veterinary medicine, application of herbs to livestock diseases - Use of forage obtained from hedgerows and compound farms - Agroforestry, - Planting Crop varieties with early maturity, - Drought resistance species, - Use of mulching for young seedling, - Addition of fertilizers, - Intercropping with leguminous crops, - Addition of manure
SAHEL	- Construction of dams, - Run-off water harvesting, - Construction of waterways to manage flooding - Agro-forestry, - Planting of crop varieties that are tolerant to variable rainfall patterns (soya bean, upland rice), - Resort to irrigation, and use of fadama land (wetland) for crop production. - Minimum or no tillage, - Rotational cropping - Grazing land improvement, - Improved breeding, - Stocking density management (e.g. herd size/land area), - Improved feed management (higher feed quality), and - Manure management (barn design)

Source: Nwajiuba et al. (2015)

5. ASSESSMENT OF NIGERIA'S AGRICULTURAL SECTOR PERFORMANCE

Nigeria has undertaken numerous agricultural development and adaptation policies over the last decade, aiming to ensure food security, drive inclusive growth, support sustainable economic diversification, and foster wealth creation. This section analyses the outcomes of these initiatives, focusing specifically on three pivotal aspects: agricultural production and productivity, as well as price overall trends.

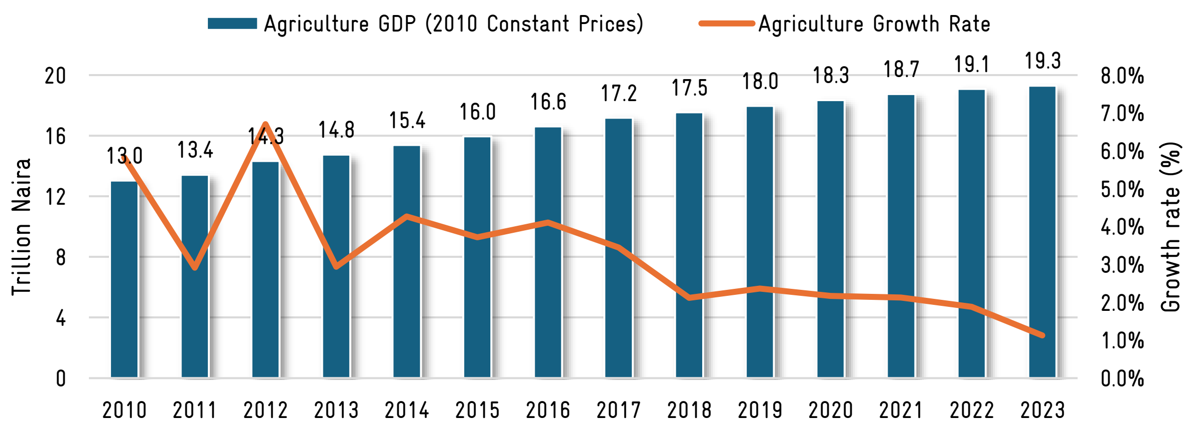
5.1. Aggregate agricultural GDP performance

From 2010 to 2023, Nigeria's agricultural sector demonstrated steady growth in aggregate production, increasing from ₦13.05 trillion in 2010 to ₦19.31 trillion in 2023 (Figure 6). This reflects an average annual growth rate of approximately 3.2%. However, the annual growth rate, which started at a robust 5.8% in 2010, declined consistently to just 1.1% in 2023, highlighting significant challenges in sustaining productivity and structural growth.

Moreover, when assessed against the ambitious targets set in various national policies and plans, performance falls significantly short of expectations. For instance, under the Vision 20:2020, agriculture was envisioned to achieve a 300% productivity increase by 2015 and 600% by 2020, alongside transforming into a mechanized system and expanding irrigated land to 10% of cultivable land by 2020. Actual aggregate output grew by only 22.3% from 2010 to 2015 and by 37.8% by 2020, far below the outlined targets. Limited mechanization and reliance on rain-fed agriculture further hampered growth.

The Agriculture Promotion Policy (APP) (2016–2020) aimed for an annual sectoral growth rate of 6–12%, leveraging improved productivity and reduced post-harvest losses. Aggregate agricultural production grew from ₦16.61 trillion in 2016 to ₦18.35 trillion in 2020, corresponding to an average annual growth rate of 2.5%. Crop production, which rose from ₦14.89 trillion to ₦16.54 trillion over the same period, was driven by policies like rice self-sufficiency under the Anchor Borrowers' Programme. However, the livestock subsector exhibited stagnation, growing from ₦1.19 trillion in 2016 to only ₦1.23 trillion in 2020, constrained by persistent issues such as inadequate grazing reserves and conflict between herders and farmers.

Figure 6. Agricultural GDP (constant 2010 Naira), 2010-2023



Source: Author's diagram based on data from the CBN 2023 statistical on Domestic Production, Consumption and Prices.

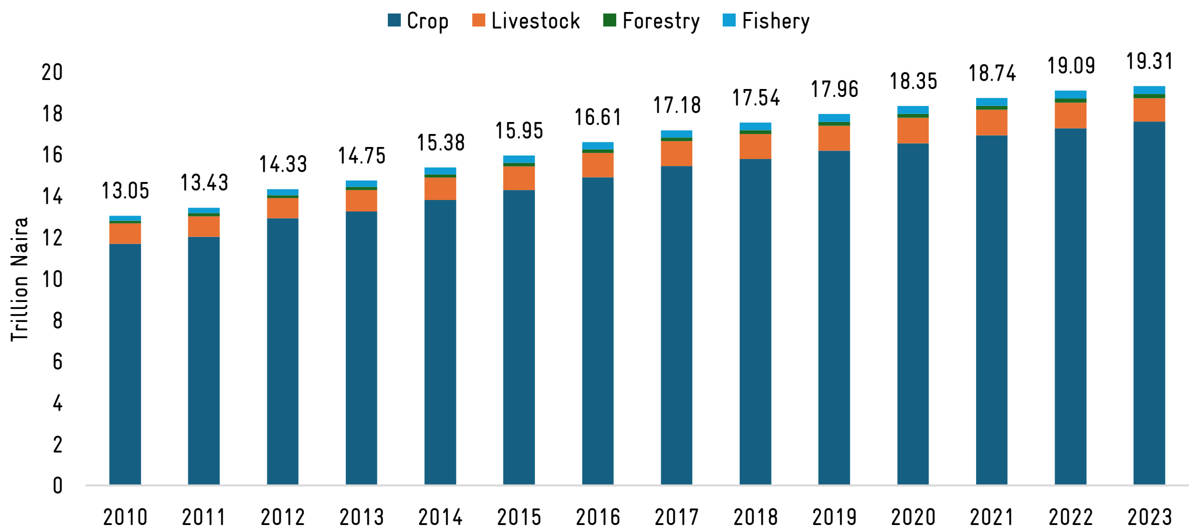
The National Development Plan (NDP) 2021–2025 and Nigeria Agenda 2050 emphasise the integration of climate-smart practices to boost productivity. For example, the NDP targets increasing total arable land under cultivation from 34 million to 42 million hectares and halving post-harvest losses by 2025. However, as of 2023, while aggregate agricultural production reached ₦19.31 trillion, its annual growth rate of approximately 3% remains insufficient to meet the NDP's goal of achieving 4.6% annual economic growth. The crop subsector's growth to ₦17.59 trillion in 2023 is noteworthy but falls short of transformative targets envisioned by these policies.

While Nigeria's agricultural sector has shown consistent growth over the years, its performance remains below the ambitious benchmarks set in national policies. Challenges such as limited mechanization, poor infrastructure, climate impacts, and weak policy implementation have constrained the sector's potential. Future efforts must focus on scaling up investments in technology, irrigation, and mechanisation, while addressing structural challenges to achieve long-term targets.

The crop sub-sector demonstrated consistent absolute growth from ₦11.68 trillion in 2010 to ₦17.59 trillion in 2023. However, the growth rates fluctuated significantly, with a peak of 7.51% in 2012, slowing to just 1.88% by 2023 (Figure 8). This gradual deceleration underscores the sector's inability to sustain the robust growth required to achieve targets like the Agricultural Promotion Policy (APP), which aimed for annual growth of 6–12%. Challenges such as limited mechanization and persistent post-harvest losses remain significant barriers despite policies under the Agricultural Transformation Agenda (ATA) and NDP 2021–2025.

The livestock sub-sector showed modest absolute growth from ₦0.98 trillion in 2010 to ₦1.14 trillion in 2023. However, growth rates were erratic, peaking at 6.45% in 2010 before plummeting to -2.67% in 2012 and a sharp decline of -8.61% in 2023. These trends highlight severe structural inefficiencies, including inadequate grazing infrastructure and conflicts between herders and farmers. Despite ambitious modernization goals outlined in the National Livestock Transformation Plan (NLTP), the sector's underperformance suggests a need for stronger interventions.

Figure 7. Agricultural GDP by sub-sector, 2010-2023



Note: Value at the top of the columns represent agriculture GDP values in trillion Naira.
Source: Author's diagram based on data from the CBN 2023 statistical on Domestic Production, Consumption and Prices.

The forestry sub-sector grew from ₦0.14 trillion in 2010 to ₦0.20 trillion in 2023, with annual growth rates averaging below 4% after 2015. Despite efforts under the Great Green Wall Initiative (GGW) to promote afforestation, limited investments and implementation gaps have constrained the sector's contribution to overall agricultural GDP. Growth rates, while positive, highlight the need for scaling up afforestation efforts and enhancing value-added forestry products.

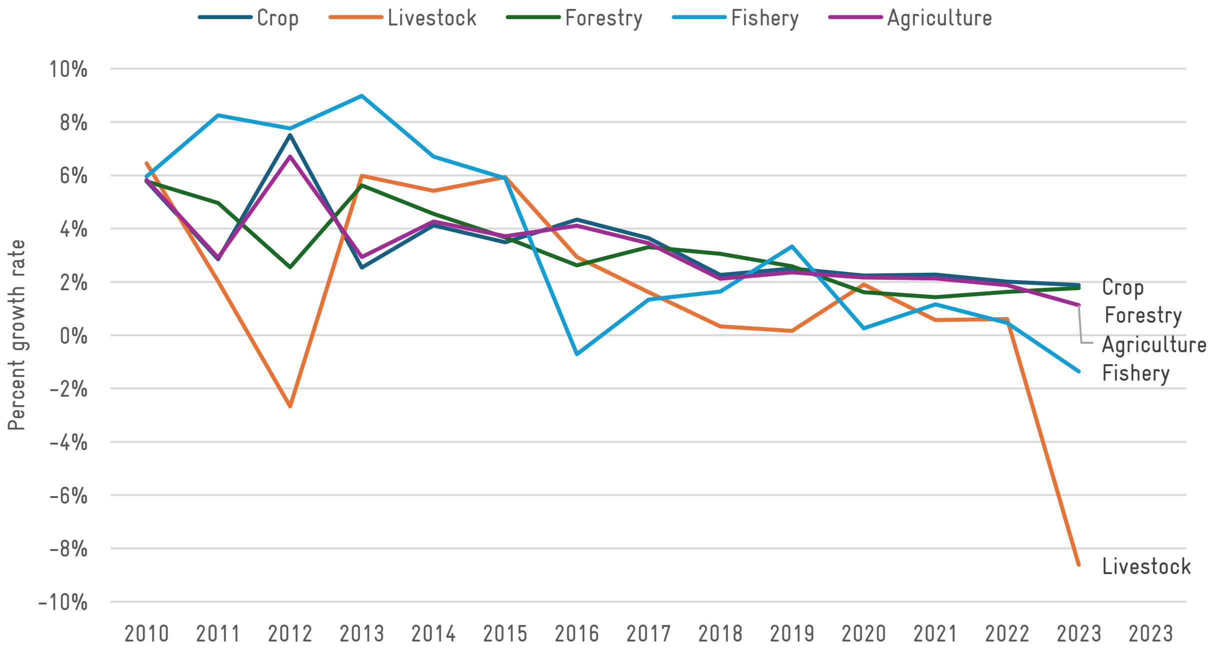
The fisheries sub-sector experienced absolute growth from ₦0.25 trillion in 2010 to ₦0.38 trillion in 2023. However, growth rates were highly volatile, peaking at 8.98% in 2013 but declining to -1.36% in 2023. This underperformance reflects infrastructural deficits and insufficient investment in aquaculture development, despite ambitious targets under the ATA (2011–2015) and NDP 2021–2025, which sought significant increases in fish production and the establishment of fish farms.

The relatively outsized dependence on crops production increases vulnerability to climate shocks, pests, and diseases. Additionally, the underperformance of non-crop sub-sectors suggest missed opportunities for diversification and higher value-added for Nigeria.

5.2. Factor productivity

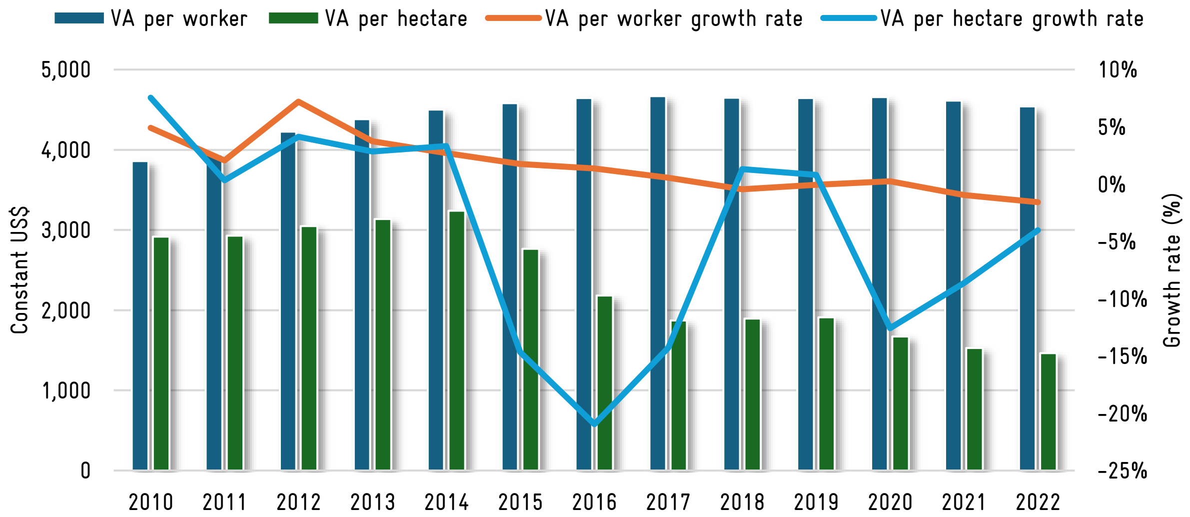
The data on labour productivity (agriculture value added per worker) and land productivity (agriculture value added per hectare, excluding fisheries) offers critical insights into the performance of Nigeria's agricultural sector over the period from 2010 to 2022 (Figure 9). The trends underscore systemic inefficiencies and highlight the sector's struggles to achieve sustained growth amidst evolving challenges, including climate change, resource constraints, and policy gaps.

Figure 8. Agriculture sector growth performance



Source: Author's diagram based on data from the CBN 2023 statistical on Domestic Production, Consumption and Prices.

Figure 9. Labour and land productivity and growth rates



Source: Author's diagram based on data from the CBN 2023 statistical on Domestic Production, Consumption and Prices.

The value-added per worker increased from $3,860.23 in 2010 to $4,540.77 in 2022, reflecting some progress in labour utilization. However, growth rates slowed significantly over the years, with a peak of 7.20% in 2012 driven by early successes of the Agricultural Transformation Agenda (ATA) and Vision 20:2020, but declining thereafter, with negative growth of -0.45% in 2018 and -1.57% in 2022. This stagnation indicates inefficiencies in leveraging labour for productivity gains, a challenge exacerbated by insufficient mechanization, weak extension services, and limited access to modern technologies, despite the Agricultural Promotion Policy (APP) aiming for 6–12% annual growth in agricultural GDP contributions.

In contrast, value-added per hectare showed a dramatic decline from $3,238.00 in 2014 to $1,465.96 in 2022, with sharp negative growth rates such as -14.66% in 2015 and -20.95% in 2016. This decline underscores persistent inefficiencies in land use, including inadequate irrigation infrastructure, poor soil fertility management, and high post-harvest losses. These challenges have persisted despite ambitious targets under the ATA, APP, and NATIP to enhance land productivity through expanded irrigation, reduced losses, and improved access to quality inputs. For instance, NATIP set a goal to increase irrigated land from 1% to 5% of cultivable land and halve post-harvest losses by 2027, yet the data highlights that these interventions have not materialized into measurable improvements.

Overall, while labour productivity trends signal incremental progress, the severe decline in land productivity reflects critical inefficiencies that jeopardize the sector's competitiveness and sustainability. The gap between value added per worker and value added per hectare reflects a reliance on labour-intensive agricultural practices rather than intensive use of land. This suggests that land is underutilised or that agricultural practices do not maximise land productivity. Addressing these challenges requires targeted investments in mechanization, sustainable land management practices, and irrigation infrastructure to align policy outcomes with aspirations and reverse the current trajectory.

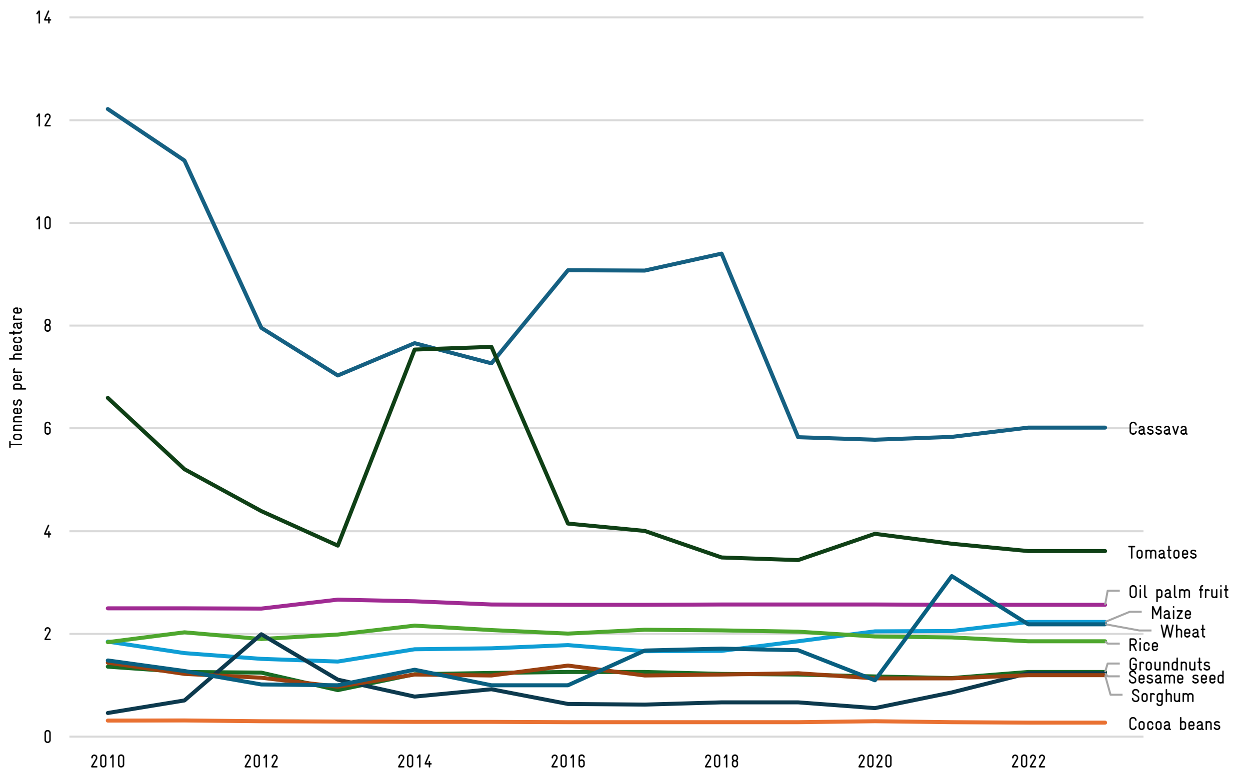
5.3. Activity-level performance

The productivity trends of key crops in Nigeria, measured in tonnes per hectare (Figure 10, Table 27, Table A1, and Table A2) reveal a mixed level of achievement against the targets set in national policy documents such as Vision 20:2020, ATA, APP, ERGP, and NATIP. These crops, including cassava, cocoa beans, groundnuts, maize, oil palm fruit, rice, sesame seed, sorghum, tomatoes, and wheat, are considered priority crops identified by these national documents for their importance to food security, economic growth, and export potential (Figure 10). Cassava, crucial for Nigeria's food security, saw productivity drop drastically from 12.22 tonnes/ha in 2010 to 5.78 tonnes/ha in 2020. Although there was a slight recovery to 6.01 tonnes/ha by 2022, this is still far below the targets of ATA and APP, which emphasized the use of improved seedlings and mechanization. The persistent underperformance highlights inefficiencies in input access and land management strategies.

Cocoa beans, a vital export crop, stagnated at around 0.28–0.31 tonnes/ha throughout the period. This is a missed opportunity, as Vision 20:2020 and ATA aimed to double cocoa productivity through improved cultivation practices and access to better inputs. The lack of growth points to persistent challenges in scaling up modern farming techniques. Groundnuts experienced significant fluctuations, declining from 1.36 tonnes/ha in 2010 to a low of 0.91 tonnes/ha in 2013 before recovering to 1.26 tonnes/ha by 2022. Despite this partial recovery, productivity remains below the APP and ATA targets, which sought to enhance oilseed production through mechanized farming and improved irrigation systems.

Maize demonstrated steady but modest growth, increasing from 1.85 tonnes/ha in 2010 to 2.23 tonnes/ha in 2022. While this aligns with APP's emphasis on maize as a priority crop, it still falls short of Vision 20:2020's goal to significantly boost yields using modern farming techniques. Oil palm fruit productivity remained flat at around 2.5–2.6 tonnes/ha throughout the period. This stagnation reflects a lack of progress toward the ATA and NATIP goals of enhancing palm fruit yields through large-scale plantations and improved processing facilities.

Figure 10. Productivity trends of priority crops identified in national policy documents



Note: The priority crops were identified in national policy documents such as Vision 20:2020, ATA, APP, ERGP, and NATIP
Source: Author's diagram based on information contained in key national policy documents

Rice, a critical crop for food security, saw productivity peak at 2.16 tonnes/ha in 2014 before falling to 1.86 tonnes/ha in 2022. This is well below the ATA and APP targets of achieving self-sufficiency through mechanization and better water management, emphasizing the need for sustained investments in infrastructure. Sesame seed productivity was highly volatile, peaking at 1.99 tonnes/ha in 2012 before plummeting to 0.56 tonnes/ha in 2020. Although it rebounded to 1.24 tonnes/ha in 2022, this instability highlights gaps in value chain development and extension services, which are critical components of the NATIP goals for oilseeds.

Sorghum, a drought-resistant staple, showed minimal improvement, with productivity hovering around 1.19 tonnes/ha by 2022, barely matching the 2010 level of 1.44 tonnes/ha. This underperformance underscores gaps in achieving APP and ATA goals, particularly in the adoption of improved drought-resistant varieties. Tomatoes saw a sharp decline from 6.59 tonnes/ha in 2010 to 3.61 tonnes/ha in 2022. This significant drop points to inefficiencies in pest management and post-harvest handling, which the ATA and NATIP aimed to address for horticultural crops. Wheat showed notable progress, with productivity rising from 1.68 tonnes/ha in 2018 to 3.13 tonnes/ha in 2021, before declining to 2.19 tonnes/ha in 2022. While the improvement reflects some alignment with ERGP and NATIP targets, the recent decline suggests the need for consistent investments in irrigation and resilient seed varieties.

Some key points flow from this analysis: cassava and tomato have high productivity although they exhibited initial volatility but stabilised likely due to improved agronomic practices. Cereal crops (maize, rice, wheat, sorghum) exhibit low productivity (1–3 tonnes per hectare). Moreover, there is an underperformance of export-oriented crops such as cocoa beans and oil palm fruit, and this indicates a missed opportunity for foreign exchange earnings and diversification.

Table 27. Agricultural production and yield in Nigeria, 2010-2023

Items	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CEREALS, PRIMARY													
Area harvested (ha)	16.13	15.51	15.32	15.89	16.96	17.07	17.24	17.99	18.20	18.28	18.03	18.41	18.27
Production (t)	24.65	20.70	21.43	20.61	26.38	26.07	27.53	27.10	28.19	29.80	29.21	29.86	30.32
Yield (t/ha)	1.53	1.33	1.40	1.30	1.56	1.53	1.60	1.51	1.55	1.63	1.62	1.62	1.66
COCOA BEANS													
Area harvested (ha)	1.27	1.24	1.27	1.24	1.14	1.06	1.05	0.89	0.95	0.88	1.19	1.00	1.02
Production (t)	0.40	0.39	0.38	0.37	0.33	0.30	0.30	0.25	0.27	0.25	0.36	0.28	0.28
Yield (t/ha)	0.31	0.31	0.30	0.30	0.29	0.29	0.28	0.28	0.28	0.28	0.30	0.28	0.27
GINGER, RAW													
Area harvested (ha)	0.05	0.05	0.09	0.12	0.05	0.07	0.09	0.10	0.10	0.09	0.10	0.10	0.10
Production (t)	0.16	0.46	0.38	0.50	0.17	0.41	0.77	0.83	0.70	0.66	0.68	0.71	0.74
Yield (t/ha)	3.10	9.41	4.04	4.00	3.54	6.05	9.08	8.69	7.36	7.25	6.68	6.91	7.74
MAIZE (CORN)													
Area harvested (ha)	4.15	5.46	5.75	5.76	6.35	5.55	5.90	6.39	6.54	6.80	6.05	6.21	5.80

Items	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Production (t)	7.68	8.88	8.69	8.42	10.79	9.54	10.53	10.63	10.93	12.60	12.40	12.74	12.95
Yield (t/ha)	1.85	1.63	1.51	1.46	1.70	1.72	1.78	1.66	1.67	1.85	2.05	2.05	2.23
MILLET													
Area harvested (ha)	4.36	2.83	1.33	1.49	1.57	1.74	1.74	1.80	1.73	1.75	1.76	1.77	2.00
Production (t)	5.17	1.27	1.28	0.91	1.85	1.81	1.49	1.53	1.88	1.93	1.91	1.93	1.94
Yield (t/ha)	1.18	0.45	0.96	0.61	1.17	1.04	0.86	0.85	1.08	1.10	1.08	1.09	0.97
OIL PALM FRUIT													
Area harvested (ha)	3.20	3.20	3.25	3.00	3.11	3.23	3.31	3.55	3.74	3.77	3.89	4.86	4.91
Production (t)	8.00	8.00	8.10	8.00	8.20	8.30	8.50	9.10	9.60	9.70	10.00	12.50	12.61
Yield (t/ha)	2.50	2.50	2.49	2.67	2.63	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57
RICE													
Area harvested (ha)	2.43	2.27	2.86	2.93	3.08	3.12	4.10	4.45	4.07	4.13	4.20	4.32	4.58
Production (t)	4.47	4.61	5.43	4.82	6.62	7.19	10.52	10.89	10.86	8.44	8.17	8.34	8.50
Yield (t/ha)	1.84	2.03	1.90	1.65	2.15	2.30	2.56	2.45	2.67	2.04	1.95	1.93	1.86
TOMATOES													
Area harvested (ha)	0.27	0.29	0.47	0.52	0.54	0.56	0.63	0.70	0.84	0.76	0.77	0.81	0.70
Production (t)	1.80	1.49	2.06	1.93	4.08	4.23	2.63	2.81	3.50	3.45	3.39	3.48	3.68
Yield (t/ha)	6.59	5.21	4.39	3.72	7.54	7.59	4.15	4.01	4.15	4.54	4.42	4.30	5.25
CATTLE													
Output	16.58	19.04	19.21	19.37	19.75	20.18	19.88	20.06	20.24	20.41	20.59	20.76	20.91
CHICKENS													
Output	0.19	0.15	0.16	0.13	0.14	0.14	0.17	0.18	0.19	0.21	0.22	0.24	0.25

Note: Area harvested are in millions of hectares; production/output are in millions of tonnes, while yields are in tonnes/hectare. Please refer to Table A1 and Table A2 in the Annex.
Source: Author's computation using data from FAO's Statistical Database (FAOSTAT, 2024).

The performance of the livestock and fishery sub-sector is worse than that of the crop sub-sector Table 27. Cattle production exhibited negligible growth over the period and failed to meet both the 2015 and 2020 targets. In 2010, cattle production stood at approximately 8 million head. By 2015, production remained stagnant at 8.3 million head, achieving only 3.75% growth and failing to approach the 3-fold target of 24 million head. By 2020, production had risen to 10 million head, achieving only 13% of the 6-fold target of 48 million head. Chicken production fared slightly better than cattle but still fell far short of the Vision 20:2020 targets. In 2010, production was approximately 200 million birds, increasing to 280 million birds in 2015, a 40% growth rate. However, this is only 13% of the 3-fold target of 600 million birds. By 2020, production reached 350 million birds, achieving just 14% of the 6-fold target of 1.2 billion birds. These figures highlight systemic challenges, including stagnant productivity, climate change vulnerabilities, and limited adoption of modern practices. Addressing these issues will require targeted investments in infrastructure, climate-smart technologies, and policy reforms to build a resilient and productive livestock sector capable of meeting Nigeria's food security and economic diversification goals.

5.4. Assessing progress in core national development plans

Table 28 presents as an assessment of agricultural key performance indicators against targets set in Nigeria's development plans since 2010. Nigeria's Food Production Index (baseline 2014–2016 = 100) rose from 85.24 in 2010 to 119.85 in 2023, indicating a steady increase in overall food output. While this is encouraging progress, it does not match the ambitious call in Vision 20:2020 for a 300% rise by 2015 and 600% by 2021.

In contrast, Agenda 2050 (NA 2050) aimed for a more moderate target of 117.2 for food production—already surpassed at 119.85. Meanwhile, the Crop Production Index grew from 84.62 to 120.89 in the same period, again exceeding NA 2050's goal of 117.4, suggesting that, despite some gaps, certain crop-focused measures have contributed to improved harvest volumes.

The Livestock Production Index reached 112.91 by 2023, which nearly meets but does not fully surpass NA 2050's objective of 114.3. Although Vision 20:2020 anticipated an even higher increase in livestock productivity, the data indicates only incremental gains—suggesting challenges with feed supplies, disease management, and limited infrastructure for animal health services. Addressing these areas could foster growth in meat and dairy outputs, improving rural incomes and improving nutritional security.

NA 2050 established a target of 2,924 kg/ha for cereals, but the data shows yields improving from around 1,528 kg/ha in 2010 to about 1,656 kg/ha by 2023. This gradual rise indicates the sector's capacity for incremental improvements yet still falls short of the envisioned figure—pointing to shortfalls in mechanization, irrigation, and extension support. Achieving near-3,000 kg/ha yields will require more robust seed systems, improved soil management, and reliable access to water during critical stages of crop growth.

A key NDP 2021-2025 target is to bring irrigation coverage to 10% of arable land, yet actual irrigation remains below 2%. Heavy reliance on seasonal rainfall makes farmers vulnerable to climate variability and erratic weather patterns, affecting yield potential. Expanding irrigation—through small-scale water harvesting, rehabilitating old dams, or involving the private sector—could stabilize harvests, boost annual output, and help close the gap between planned and actual cereal yields.

Total commercial bank credit to agriculture climbed from roughly ₦128.41 billion (2010) to well above ₦2.25 trillion by 2023, indicating an increase in investment. However, the data does not clarify whether these funds trickle down to smallholder farmers—central to Nigeria's food systems—or mainly flow to larger enterprises. Both Vision 20:2020 and NA 2050 stress the importance of commercializing small-scale farming, yet it remains unclear whether loan expansion has translated into widespread improvements on family-run farms.

The NDP 2021–2025 aims to reduce food losses to 30% (Agenda 2050 sets it at 35%) but figures still hover between 40% and 60%. Such high spoilage rates severely dampen the benefits of enhanced production, eroding farmer incomes and the availability of food in local markets. Addressing this problem requires investments in improved storage and handling, efficient processing facilities, and effective transport networks—changes that could substantially increase the impact of any production gains already achieved.

Vision 20:2020 proposed an extension worker–to–farmer ratio of 1:500, yet recent estimates place it closer to 1:4000. This shortfall limits how quickly new practices—such as climate-smart farming, pest management, or modern seed adoption—can spread. Enhancing extension capacity is crucial if Nigeria hopes to raise cereal yields to NA 2050 levels and meet many of its broader agricultural goals.

Expanding arable land to 42 million hectares is another key NDP 2021-2025 objective, but the data shows about 36.87 million hectares under cultivation in recent years, indicating that land use still lags behind the plan. Additionally, agricultural raw materials exports remain between 0.11% and 0.38% of total merchandise exports—far from the 6.12% target. Encouraging higher-value agro-processing and meeting export standards could not only diversify foreign exchange earnings but also raise incomes for farmers producing export-grade crops.

Table 28. Assessing agricultural sector targets in Nigeria's development plans since 2010

							National plans with agricultural development targets		
Key performance indicators (KPI)	2010	2019	2020	2021	2022	2023	NA 2050	NDP 2021-2025	Vision 20:2020
Food production index (2014-2016 = 100)	85.24	109.77	112.64	117.33	119.85		117.2		2015: 3-fold increase 2020: 6-fold increase
Livestock production index (2014-2016 = 100)	98.36	108.44	111.48	111.54	112.91		114.3		2015: 3-fold increase 2020: 6-fold increase
Crop production index (2014-2016 = 100)	84.62	109.64	112.71	118.31	120.89		117.4		2015: 3-fold increase 2020: 6-fold increase
Cereal yield (kg per hectare)	1,528.00	1,628.20	1,620.50	1,619.20	1,656.20		2,924		2015: 3-fold increase 2020: 6-fold increase
Cereals (primary) Yield (tonnes/hectare)	1.53	1.63	1.62	1.62	1.66	1.55			
Total Credit to Agriculture (2015 prices-Billion ₦)	10,511	11,605	12,755 (NA2050: 20.4)	13,858	15,053	20,195	2025: 30.7 2030: 40.9 2035: 51.2 2040: 61.5 2045: 71.7 2050: 82		
Credit to Agriculture, Forestry and Fishing (2015 prices - Billion ₦)	175	521	657 (NA2050: 10.49)	1,049.68	908	1,023	2025: 15.74 2030: 20.99 2035: 26.25 2040: 31.50 2045: 36.75 2050: 42		
Food losses and wastage (total food production in per cent)		40		60	60	50	35	30	
Extension to farmer ratio				1:4000					1:500
Agricultural irrigated land (% of total agricultural land)				<2%	<2%				10
Arable land (hectares)	35,940,000	36,872,000	36,872,000	36,872,000	36,872,000			42,000,000	
Agricultural raw materials exports (% of merchandise exports)	1.63	0.11	0.16	0.26	0.20	0.38		6.12	

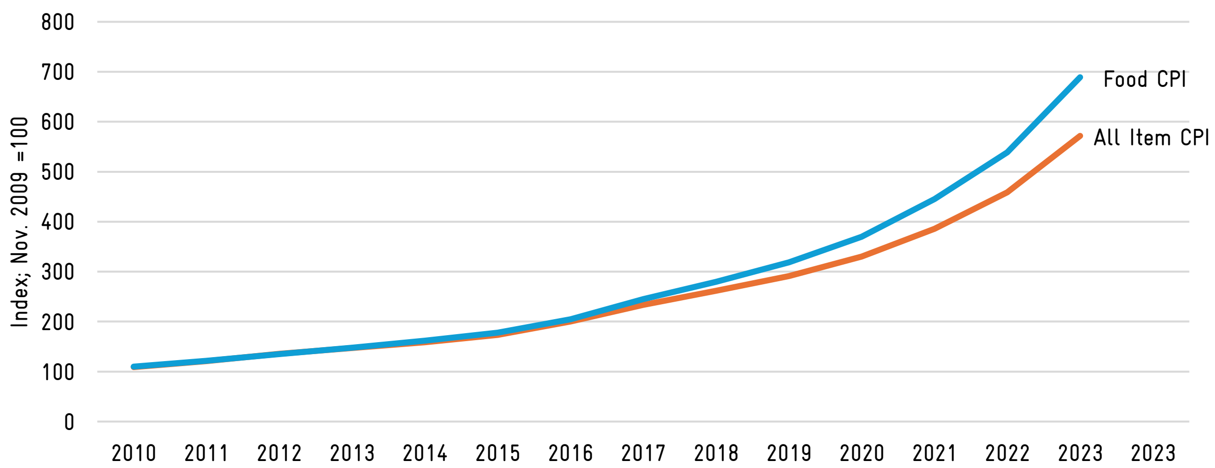
Note: The data presented here are agricultural-related targets in Nigeria's key development plans since 2010.
Source: Nigeria Agenda 2050 (FMFBNP, 2021b), National Development Plan 2021-2050 (FMFBNP, 2021a), Vision 20:2020 (FGN, 2010), NAERLS & FMARD (2021), FAOSTAT (2024), World Development Indicators Database (2024), Xie et al. (2017).

5.5. Inflationary trends and agricultural context

The performance of the agricultural sector in terms of ensuring food security depends largely on the prices of agricultural products (Olomola & Nwafor, 2018). Figure 11 presents the inflation data, as measured by the Consumer Price Index (CPI) for all items and food items, between 2010 and 2023. The CPI for all items increased significantly from 108.93 in 2010 to 571.77 in 2023, representing a staggering 425% increase over the period. Similarly, the Food CPI rose even more sharply, from 109.94 in 2010 to 689.04 in 2023, reflecting a 526% increase. The faster rise in Food CPI relative to the overall CPI shows the disproportionate impact of inflation on food prices, a direct consequence of inefficiencies and systemic challenges in the agricultural sector. The steep rise in food prices correlates closely with stagnating or declining yields in key crops like cocoa, millet, and rice, and limited productivity improvements in livestock production. The inability of the agricultural sector to significantly boost productivity has compounded food supply constraints (low productivity, underinvestment, insecurity, underdeveloped value chains, and climate vulnerability), contributing to the increased inflationary pressures in the food sector.

The challenges facing Nigeria's agricultural sector, from stagnant productivity to vulnerability to climate change and inflationary pressures, highlight the sector's struggle to meet key national development targets. Despite these persistent obstacles, there is a growing body of evidence suggesting that proactive adaptation strategies can unlock significant opportunities. By addressing inefficiencies and enhancing resilience, adaptation actions can transform agriculture into a driver of both microeconomic and macroeconomic growth. At the micro level, farmers can achieve improved yields, reduced costs, and better livelihoods through the adoption of climate-smart practices and efficient resource management. At the macro level, these adaptations can stabilise food supplies, curb inflationary pressures, and contribute to broader economic stability and growth. The next section explores case studies that demonstrate how adaptation initiatives in the agricultural sector have successfully delivered tangible benefits across multiple dimensions, offering valuable lessons for Nigeria's path forward.

Figure 11. Trend of consumer price index for 2010-2023



Source: Author's diagram based on data from the CBN 2023 statistical on Domestic Production, Consumption and Prices.

6. AGRICULTURAL ADAPTATION IN ACTION
LESSONS FOR GROWTH AND RESILIENCE

Adaptation in the agricultural sector is increasingly recognized as a critical pathway for addressing the challenges of food security, economic stability, and climate resilience. Despite developing several adaptation policies and strategies relevant to the agricultural sector, Nigeria lacks a formalised or systematic approach to assessing, monitoring, reviewing, or reporting on ongoing adaptation efforts at all government levels in the country (i.e., federal, state, or local) (Federal Republic of Nigeria, 2021; NCCC, 2023b). However, both peer-reviewed and grey literature provide some evidence of adaptation actions as well as their impacts across various agricultural and socio-economic dimensions in the country. Please refer to Table 29 for detailed summary of the studies. These actions are aligned with certain relevant national policy documents presented in this report (see Section 4).

6.1. Macro-level insights: computable general equilibrium (CGE) models

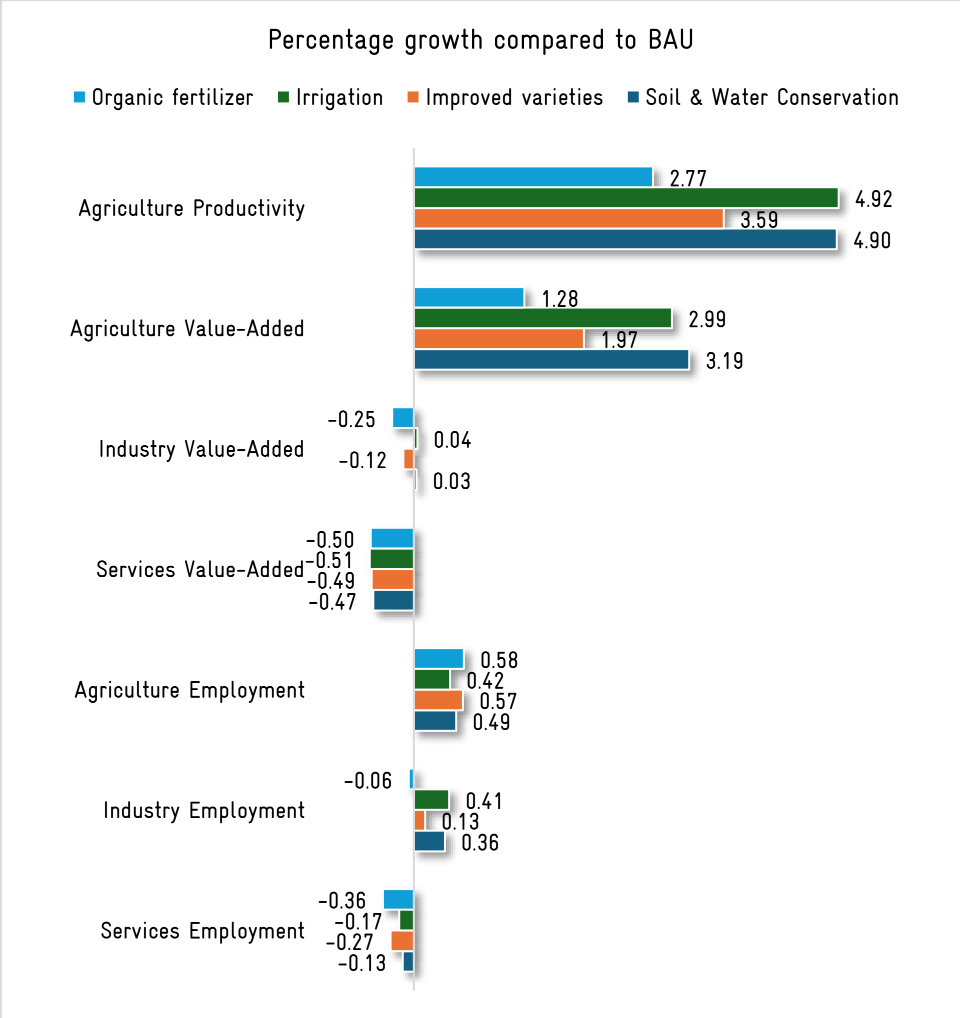
Recent computable general equilibrium (CGE) modelling exercises, such as the one by NCCC (2023a), demonstrate how climate change, in the absence of adaptation, would reduce Nigeria's GDP by approximately 4.9% by 2050, with agriculture accounting for a majority of those losses. The study's proposed adaptive practices—particularly soil and water conservation, improved crop varieties, irrigation, and organic fertilization—were found to improve agricultural productivity, mitigate overall GDP declines, and create modest gains in employment across agriculture and industry (Figure 12).

The analysis underscores the vital role of adaptation measures in building resilience in Nigeria's agricultural sector. Soil and water conservation emerged as the most impactful measure, addressing fundamental issues of soil degradation and water management. Improved crop varieties and organic fertilizers complement these efforts by ensuring yield stability and enhancing soil quality. The expansion of irrigation is particularly important for mitigating the effects of rainfall variability, especially in regions where water scarcity limits agricultural potential. Beyond productivity, these measures support macroeconomic stability by reducing food price volatility, stabilizing export revenues, and creating rural employment opportunities.

Consequently, the report estimates the required expansion of climate-smart soil and water conservation practices (e.g., tillage, terracing, ridging, bunds, and mulching) to cover an additional 58% of the cultivated area (Figure 13) to recover from the damage to GDP due to climate shocks. Additionally, if the required expansion adjustment behaviour or real investment in improved varieties, irrigation, and organic fertilizer are 50%, 38%, and 25%, respectively (NCCC, 2023a).

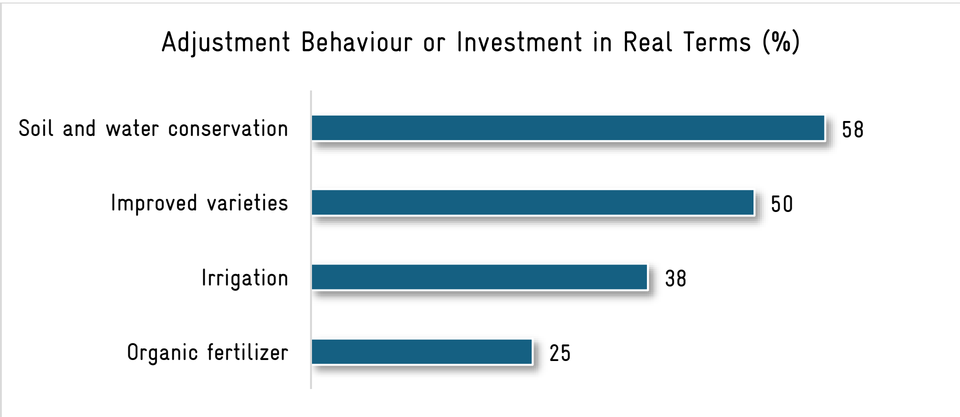
These recommended measures closely mirror the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) and National Agricultural Resilience Framework (NARF), both of which emphasize the importance of combining "soft" interventions (e.g., improved seeds, soil fertility management) with "hard" investments (e.g., irrigation infrastructure). They also align well with the Agriculture Promotion Policy (APP) focus on stimulating fertilizer availability, advancing water-use efficiency, and broadening access to climate-smart technologies, as well as with the newly updated National Climate Change Policy (NCCP 2021–2030) that advocates improving farmers' access to drought-resistant crop varieties and irrigation systems.

Figure 12. Breakdown of expected impacts of adaptation measure



Source: Author's diagram based on estimates from Nigeria's LT-LEDS(NCCC, 2023a) .

Figure 13. Adaptation measures to compensate for CC-induced GDP decline in Nigeria (% of cultivated area)



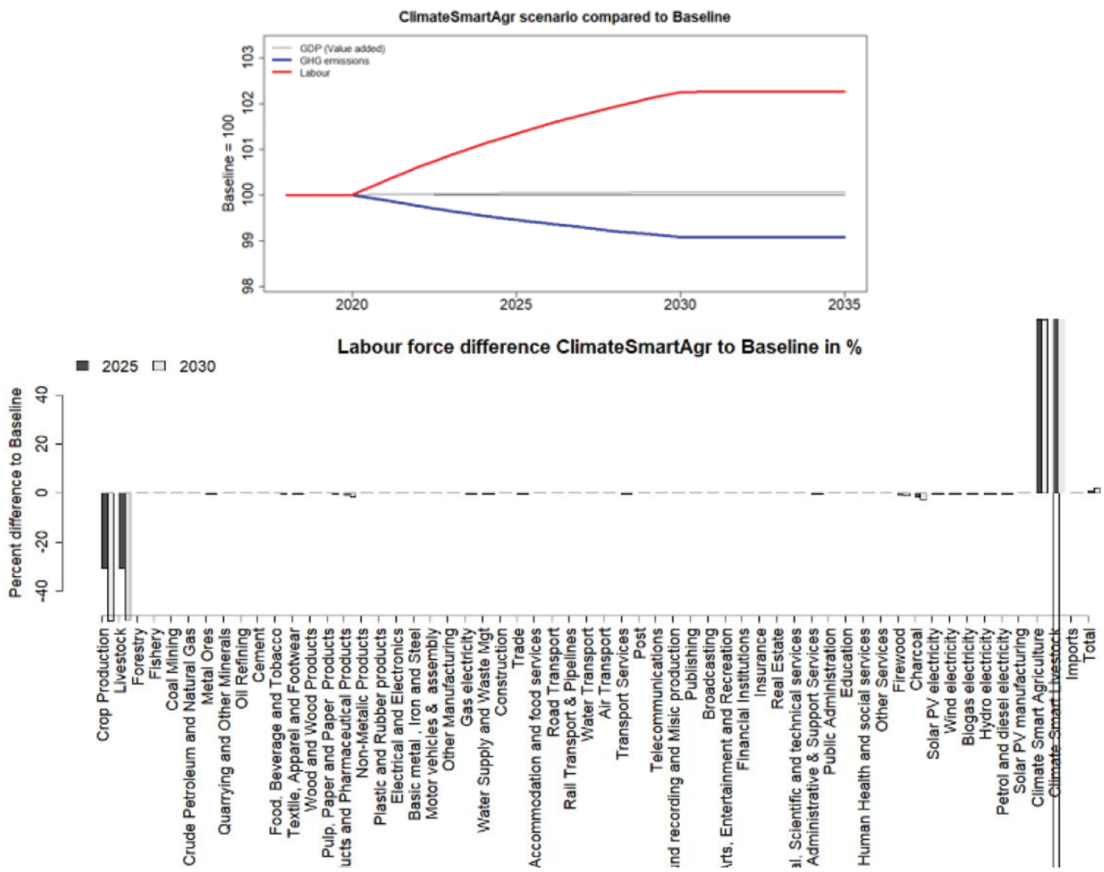
Source: Author's diagram based on estimates from Nigeria's LT-LEDS(NCCC, 2023a) .

The findings also emphasize the need for significant upfront investments in adaptation infrastructure and capacity building. Although these measures require resources, their long-term benefits—reduced GDP losses, enhanced productivity, and improved food security—far outweigh the costs. Policy priorities must align with these insights, focusing on incentivizing the adoption of climate-smart practices, expanding irrigation infrastructure, and integrating adaptation efforts into national development strategies.

Similarly, a macroeconomic analysis by UNDP and ILO (2021) reveals that adopting climate-smart agriculture (CSA) can lead to net employment gains not only in agriculture but also in other sectors of the economy, underscoring how increased labour inputs for soil conservation, agroforestry, and efficient fertilizer usage have expansive multiplier effects (Figure 14). Such a finding aligns strongly with the National Economic Sustainability Plan (NESP), where the Mass Agricultural Programme similarly aims to generate large-scale rural employment through more sustainable intensification of crop, livestock, and aquaculture value chains. It also complements the National Livestock Transformation Plan (NLTP), which calls for semi-intensive systems, improved grazing reserves, and feed production—practices that can be integrated into broader CSA efforts to enhance on-farm resilience and new job opportunities.

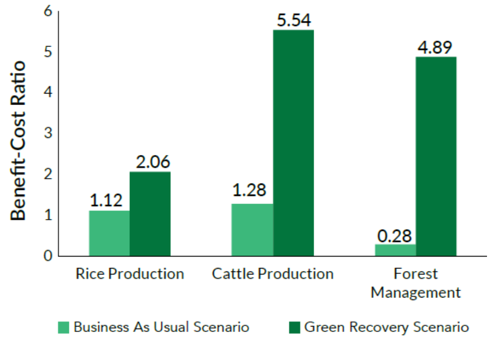
Additionally, CGE-based work by Bosello *et al.* (2018) and Cervigni *et al.* (2013) highlights how "soft" adaptation measures, such as shifting planting dates and applying modest fertilization, can nearly offset climate-induced yield reductions for staple crops like rice, millet, and maize in the long run. These findings speak directly to the NCCPRS (2012) recommendation to promote better agronomic practices—such as adjusting planting schedules and integrating conservation agriculture—to tackle emerging climatic shifts. They further reinforce the National Agricultural Technology and Innovation Policy (NATIP, 2022–2027), which prioritizes introducing drought-tolerant seeds and efficient water management techniques to boost productivity in a range of cereal and root crops.

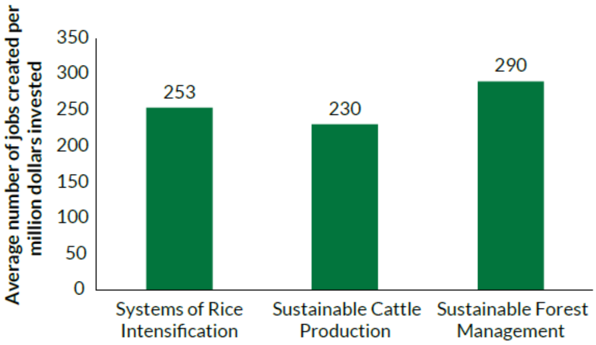
Figure 14. CSA scenario compared to baseline: total employment/emissions/value added



Source: UNDP and ILO (2021)

Figure 15. Results of socioeconomic and environmental impacts of improved agricultural practices in Nigeria's NDC





Source: Onyeneke at al. (2022)

6.2. Bottom-up evidence: case studies and local innovations

Moving from macro-level interventions to more localized, bottom-up adaptation strategies, Okeke *et al.* (2023) document how fish farmers in Lagos have responded autonomously to persistent water stress and disease risks. By drilling deeper boreholes, developing rugged hybrid catfish species (Heteroclarias), and applying bitter leaf juice to mitigate fish mortality, they sustained production and improved local livelihoods. Such practices align with the National Adaptation Strategy and Plan of Action (NASPA-CCN) and the Nationally Determined Contributions (NDC), both of which encourage private-sector innovation and the development of stress-resistant livestock and aquaculture species. They also reinforce the NATIP priority of driving research and technology deployment in fisheries to secure Nigeria's protein supply, especially in coastal and mangrove regions vulnerable to climate extremes.

In a further assessment of cost-effectiveness, Onyeneke *et al.* (2022) compare "green" approaches, such as the System of Rice Intensification (SRI) and Sustainable Forest and Land Management (SFLM), with conventional practices. They report significantly higher benefit-cost ratios for the greener options, ranging from about 2.06 for SRI to 5.54 for sustainable cattle production, alongside the creation of additional jobs (Figure 15).

This strong economic performance ties in with the Agricultural Transformation Agenda (ATA) from 2011–2015, which, despite not being explicitly climate-focused, emphasized improving input distribution, boosting fertilizer usage, and rehabilitating irrigation schemes. By highlighting that greener choices yield strong returns and employment gains, these findings illustrate how climate-responsive approaches can augment the larger policy objective from the Nigeria Vision 20:2020 (NV20:2020) to promote accelerated growth and wealth creation in rural areas.

Meanwhile, Nzegbule *et al.* (2018) document community-based projects in both the Sahel and Guinea Savanna zones, revealing how constructing boreholes, introducing drought-resistant seeds, reclaiming sand dunes, creating micro-credit schemes, and establishing beekeeping or snail-farming ventures all helped communities build resilience, generate alternative incomes, and improve water availability. These community-oriented measures are reminiscent of the Great Green Wall (GGW) Initiative and National Agency for the Great Green Wall (NAGGW) objectives to restore degraded landscapes, stabilize sand dunes, and advance alternative livelihoods in dryland areas of northern Nigeria. They are also directly aligned with NARF (2014), which emphasizes local-level adaptation planning, and the updated NDC (2021), which calls for harnessing agroforestry and livelihood diversification to reduce vulnerability, particularly in frontline states prone to drought and desertification.

A systematic literature review by Onyeneke *et al.* (2019), spanning crops, livestock, and fisheries, shows that widespread autonomous measures—ranging from zero-tillage and agroforestry to climate information services—can significantly increase farm yields and incomes while reducing environmental degradation. These findings confirm the importance of grassroots adaptation and support the Climate Change Act (2021) directive that mandates Nigeria to integrate climate adaptation into broader national policies at all levels of governance. By demonstrating success in areas such as crossbreeding hybrid birds or introducing locally adapted fish and livestock breeds, the study directly relates to the NLTP call for improved livestock breeding and to the APP goal of ensuring farmers' access to improved genetic stock and better feeding systems.

Collectively, these studies underscore the multi-tiered nature of Nigeria's adaptation landscape. Larger-scale projections show that policies aligning with the NASPA-CCN, NARF, NCCPRS, and NCCP (2021–2030) can effectively guard against national economic losses and even stimulate modest growth through well-planned interventions in irrigation, soil conservation, and improved seeds. Local interventions, meanwhile, reflect the embedded principles of the ATA, APP, NESP, NLTP, and the revised NDC, illustrating how adaptive resource management, livelihood diversification, and technology adoption can be harnessed to build resilience from the ground up. By linking research-based recommendations—whether macro-level or community-driven—to concrete policy objectives, Nigeria can strengthen the synergy between top-down frameworks and bottom-up practices.

These findings collectively suggest that consolidating efforts across key documents, ensuring robust financing and extension support, and systematically tracking adaptation outcomes are essential next steps in cementing real, sustained progress in climate-resilient agriculture.

The picture that emerges is one of broad convergence between local adaptation initiatives and the overarching goals of national climate and development policies. Studies consistently highlight soil and water management, stress-tolerant crop varieties, infrastructure development for irrigation, expanded livestock fodder production, and improved fisheries management as central pillars of effective adaptation. When pursued together, these strategies yield economic, social, and environmental benefits that are linked with multiple policy ambitions—from Vision 20:2020 to the Climate Change Act, the NA-2050/NDP, and beyond.

Table 29. State of the art in agricultural sector climate change adaptation practices and impacts in Nigeria

Reference	Economic method	Scope		Scale	Model structure	Sector	Adaptation focus	Practice(s)	Region	Investment	Finding
		Impacts	Adaptation								
NCCC (2023a)	CGE	- Productivity - Value-added - Employment	Planned	Economy-wide	Top-down	Crop	Soft and hard measures	- Soil and water conservation (reduced tillage, terracing, ridging, bunds, and mulching) - Use of improved varieties - Irrigation - Use of organic fertiliser	National	NA	
			Without adaptation: - Climate change would lead to a 4.9% decrease in GDP by 2050 without adaptation - The agriculture sector is expected to account for 64% of the GDP decline - The industry sector, reliant on agricultural inputs, contributes 20% of the GDP decline, while the services sector accounts for 16%.			With adaptation (compared to BAU): - Soil and water cons.: Agric productivity: 4.90% Agric. Value-added: 3.19% Industry value-added: 0.03% Services value-added: -0.47% Agric employment 0.49% Industry employment: 0.36% Services employment: -0.13%		- Improved crop varieties: Agric productivity: 3.59% Agric. Value-added: 1.97% Industry value-added: -0.12% Services value-added: -0.49% Agric employment 0.57% Industry employment: 0.13% Services employment: -0.27%	- Irrigation: Agric productivity: 4.92% Agric. Value-added: 2.99% Industry value-added: 0.04% Services value-added: -0.51% Agric employment 0.42% Industry employment: 0.41% Services employment: -0.17%		- Organic fertiliser: Agric productivity: 2.77% Agric. Value-added: 1.28% Industry value-added: -0.25% Services value-added: -0.50% Agric employment 0.58% Industry employment: -0.06% Services employment: -0.36%
Okeke et al. (2023)	Review	- Productivity - Livelihood	Autonomous	Case study	Bottom-up	Fishery	Soft measures	- Crossbreeding female Clarias gariepinus and male Heterobanchus longifilis to produce their hybrid Heteroclarias, which is very rugged and disease resistant. - Drilling deeper water boreholes for easy access to constant water availability - Introduction of several types and mixtures of locally sourced feeds which are highly nutritious - Introduction of bitter leaf juice (Vernonia amygdalina) into the fishponds to reduce fish mortality	Lagos	NA	- Increased production - Farmers managed to maintain their fish farming practices and improve the economic, social and environmental sustainability of their community.
Onyeneke et al. (2022)	Cost-Benefit Analysis	- Benefit-cost ratio - Employment - Emissions (Gg CO_2e)	Planned	Selected projects	Bottom-up	Crop Livestock	Soft and hard	- Systems of rice intensification (**SRI**) - Sustainable cattle production (**SCP**) - Sustainable forest and land management (**SFLM**)	National	NA	SRI Economic impact: Green option's BCR = 2.06 (conventional option's BCR = 1.12) Employment per million Dollars invested is 253. SCP Economic impact: Green option's BCR = 5.54 (conventional option's BCR = 1.28)

Reference	Economic method	Scope		Scale	Model structure	Sector	Adaptation focus	Practice(s)	Region	Investment	Finding
		Impacts	Adaptation								
											Employment per million Dollars invested is 230. SFLM Economic impact: Green option's BCR = 4.89 (conventional option's BCR = 0.28) Employment per million Dollars invested is 290.
UNDP and ILO (2021)	CGE	- Employment Horizon: 2030	Planned	Economy	Top-down	- Crop Livestock	Soft and hard measures	Climate-smart agriculture (crop and livestock) Improved soils and nutrient management through tillage and grassland systems, Efficient use of fertilizers, Agro-forestry, Crop rotation, Higher use of storage and transport services to reduce post-harvest losses, Use of drought-resistant crops and livestock feed, and Better use of irrigation systems	National	₦2,425 billion $12 billion (@ ₦195/$1) Infrastructure and services (57%) Irrigation and drainage (38%), Equipment and machinery (5%)	CSA-based agricultural production is more employment intensive than the reference/baseline scenario employment loss in conventional agriculture is absorbed by conservation agriculture higher employment in all industries in the Nigerian economy due to higher investments Long run, there is increased labour inputs for practices, such as adoption of low-tillage agriculture, are provided primarily by household labour (especially women).
Bosello et al. (2018) **Cervigni et al. (2013)**	CGE	- Crop yield - GDP Horizon: 2050	Planned	Economy	Top-down	- Crop (cassava, yam, rice, millet, maize, sorghum)	Soft and hard measures	- Soft: Shift of the sowing/planting dates, manure management to complement nutrient provision, increase of ordinary fertilisation Irrigation expansion - Hard: Expansion of irrigated land through large—and small-scale irrigation plants	All agro-ecological zones (AEZs)	NA	In the long term, "soft" measures suffice to completely offset yield decline due to climate change in the NCAR run and almost completely, with the partial exception of millet and rice, in the other runs. From 14 to 18 million hectares have to be treated with soft adaptation, whereas irrigation needs to be applied to 1.7 and 1.5 additional million hectares in the RCM and GFDL runs respectively Considering a full adaptation by 2050 in the RCM scenario, the projected GDP loss is 2.6% assuming a low unit cost case. This result is more favourable than a baseline scenario where GDP loss due to climate change without adaptation in the RCM scenario is 3.6%.

Reference	Economic method	Impacts of adaptation	Scope of adaptation	Model structure	Sector	Region	Adaptation activities implemented	Impact (2-7 years post-implementation)
Nzegbule et al. (2018)	Review	Yield Income Awareness	Planned, autonomous (Community-based adaptation)	Bottom-up	- Crop - Livestock - Off-Farm work, etc.	1. (i) Tosha, Yobe State (ii) Sansan, Borno State Agro-ecological zone: Sahelian arid Sudan savanna	- Reviving of dried oases by developing boreholes - Introducing early maturing and drought resistant crop varieties - Agroforestry and creating woodlots - Providing biogas facility - Introducing improved - Fodder species - Reclaim sand dune areas	- Improved water supply for irrigation and herds - Reduction of vegetation loss and erosion through woodlot establishment - Increased fodder yield - 40% of communities aware of climate change
						2. (i) Billeri, Bauchi State (ii) Bursali, Bauchi State (iii) Gorori, Jigawa State Agro-ecological zone: Sudan savannah	- Early-maturing crop varieties - Constructing wells with handpumps - Water harvesting - Planting Jatropha woodlots - Using Drought Decision Support Tool	- Water availability has improved in the communities - Jatropha population have increased to check erosion and supply fuelwood - Crop yield improved - Farmers know how weather data are interpreted and have risk management capacity - Crop yield has improved which enhanced - Farmers' income improved
						3. (i) Dashe, Plateau State (ii) Kwaikong, Plateau State Agro-ecological zone: Guinea Savanna	- Introducing early maturing crops - Creating climate change awareness - Developing fruit tree nursery - Construction of boreholes - Instituting micro-credit scheme - Develop water purification scheme - Deepening and expansion of dams - Rainwater harvesting	- Increased crop yield - Increased income from sales of tree nursey - Reduced threat of soil erosion - Improved access to safe drinking water - Access to credit empowered women - Dry season farming made possible
						4. (i) Daudu, Benue State (ii) Falgore, Kano State Agro-ecological zone: Guinea and Sudan Savanna	- Tree planting - Deepening of earth dam - Introducing improved arable crops varieties - Dry season vegetable farming - Developing citrus farming and nursery - Beekeeping - Installing shallow boreholes for irrigation farming - Climate change awareness creation	- Improved water availability - Increased crop yield (Maize and soybean yields increased by 50–60% using drought-resistant and high-yielding varieties) - Increased income from dry season vegetable farming and honey - Additional stream of income from beekeeping
						5. (i) Wula Ekumpuo, Cross River State (ii) Bebi, Cross River State Agro-ecological zone: Rainforest and derived savanna	- Snail farming - Beekeeping - Introducing improved cassava variety - Training and provision of fuel-efficient wood stoves	- More household income from snail farming and beekeeping - Improved protein intake - Youths' livelihood primarily sourced from production of stoves - Increased tuber yield of cassava from improved varieties
						6. (i) Esuk Idebe, Cross River State (ii) Akwa Esuk Enyama, Cross River State Agro-ecological zone: Mangrove	- Livelihood diversification: Providing training and developing fishponds - Introducing fuelwood efficient stoves	- Additional stream of income for households from fishpond - More protein diet for households - Less money spent on fuelwood

Reference	Economic method	Impacts of adaptation	Scope of adaptation	Model structure	Sector	Region	Adaptation activities implemented	Impact (2-7 years post-implementation)
						7. (i) Iko Esai, Cross River State (ii) Agoi Ibami Agro-ecological zone: Rainforest	- Introducing Bee keeping to women groups - Training women groups and supporting them in Baking - Training and introduction of cocoa farming - Promoting poultry and pig farming	- Additional stream of income for households from fishpond - More protein diet for households engaged in poultry - Increased cocoa yield by120% on average - Increased enlightenment on climate change
Onyeneke et al. (2019)	Systematic Review	Yield Income Production	Autonomous	Bottom-up	- Crop - Livestock - Fishery, etc.	National (all agro-ecological and geopolitical zones)	Crop: Crop-specific innovation	- Intercropping prevents total loss in farm output due to climate induced droughts. - Mixed cropping boosts productivity - Crop diversification provides resilience by restraining pests and diseases and boosts food security, and boosts farmers' incomes - Drought-resistant and disease-resistant crop varieties boost yield - Drought-resistant maize varieties have been found to increase productivity (617 kg/ha) compared to non-drought resistant varieties (240 kg/ha) in mild drought-prone areas.
							Sustainable soil and land management	- Minimum or zero tillage practices enhance productive capacity, enable vulnerable lands to retain soil organic carbon and improve environmental sustainability - Proper fertiliser use contributes to income and financial capital of the farmers by increasing crop yields, and to soil management through fixation of nitrogen - Agroforestry improves farmers' livelihoods - Integrated diversification (mixed crop-livestock-agroforestry system) fosters livelihood diversification and security.
							Water-linked management practices	- Rainwater harvesting or application of irrigation boost crop productivity, while contributing to economic sustainability. - Water management practices contribute to improved food security, poverty reduction and increase in farm productivity
							Climate information services and education	- Climate education services provide knowledge to farmers about potential avenues to cope better in the presence of climate change - Helps to improve risk management
							Access to finance	- Improves household livelihoods security and livelihoods

Reference	Economic method	Impacts of adaptation	Scope of adaptation	Model structure	Sector	Region	Adaptation activities implemented	Impact (2-7 years post-implementation)
								- Enables farmers in Nigeria to meet other requirements for adapting to climate such as purchasing of improved crop varieties (heat-, drought, pest and disease-resistant)
							Livelihood diversification	- Off-farm diversification contributes to sustained or improved incomes and farmers may earn income to further invest in agriculture
							Livestock: Health improvement	- Administration of vaccines and antibiotics, introduction of anti-stress, planting trees to create shade around poultry pen, proper feed formulation, animal vaccination, constant water to regulate body temperature, proper treatment of water, veterinary services and quarantine services boost farm profitability
							Improved breeding strategy	- Use of high nutrient feed, use of nutrient-dense diet, crossbreeding of animals and improved grazing sites improve livestock productivity - Growing hybrid birds (crossing indigenous with foreign improved species) boost adaptability and improve farmers' incomes
							Fishery: Improved fish management	- Organic materials such as fertilizers are being induced on the fish which increases fertility and thus fish production - Stocking of quick-maturing fish species improves farm economy by ensuring accelerated time-to-market, which in return, increases the farm turnover and income, as well as improving food security.
							Water harvesting	- Water harvesting is a cost-effective measure to aid smallholder fish farmers during dry periods and thus boost livelihoods.
							Improved fishing infrastructure	- Specialized fishing gear, digging wells or boreholes to supply water during dry period, building ponds close to water sources contribute towards improving the right and access to livelihood resources.

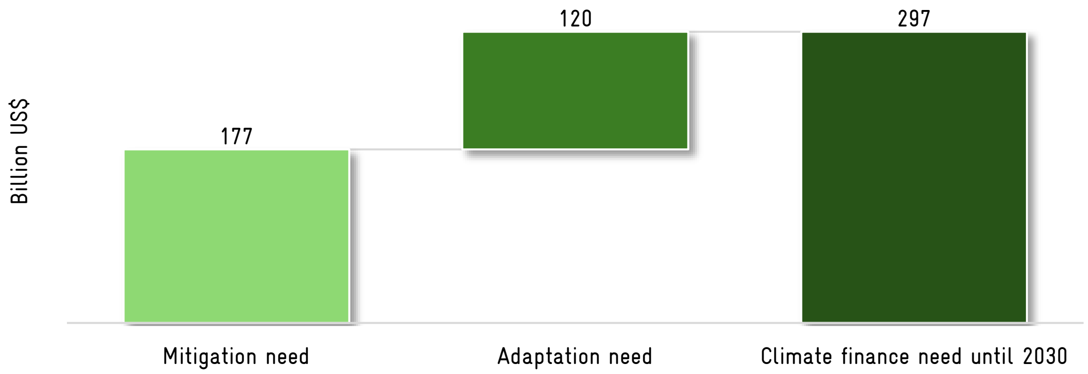
Note: The summary presented here is not exhaustive. However, it provides a detailed evidence base on Nigerian adaptation activities and their impacts from empirical, peer-reviewed literature.

7. FINANCING FOR ADAPTATION

Nigeria's updated NDC reports that Nigeria will require an estimated $177 billion to achieve its conditional NDC targets Between 2021 and 2030 (DCC, 2021). Although the country has not detailed the funding needed for adaptation and resilience goals by 2030, expert projections place this figure at $120 billion (CPI, 2024; NCCC, 2023b). This implies annual financing needs of $17.7 billion for mitigation and $12 billion for adaptation, summing up to $29.7 billion per year (CPI, 2024; NCCC, 2023b) (see Figure 16). These figures likely underestimate the actual need, as they do not account for sector-specific requirements or detailed mitigation and adaptation initiatives. Mobilizing these funds will require contributions from public, private, and blended finance sources, both domestically and internationally.

Adaptation remains a critical focus area. As outlined in the NDC, key adaptation priorities include agriculture, food security, and addressing water-related challenges such as floods, droughts, and sea level rise. In 2022, Nigeria received in climate finance $2.5 billion, which represents a 32% increase over the $1.9 billion in climate finance received in 2020, with $735 million allocated to adaptation (Figure 17). Based on the annual adaptation need of $12 billion, this leaves a funding gap of $11.3 billion per year. However, these amounts fall short of what is required to meet Nigeria's unconditional NDC target of reducing emissions by 47% from business-as-usual levels by 2030.

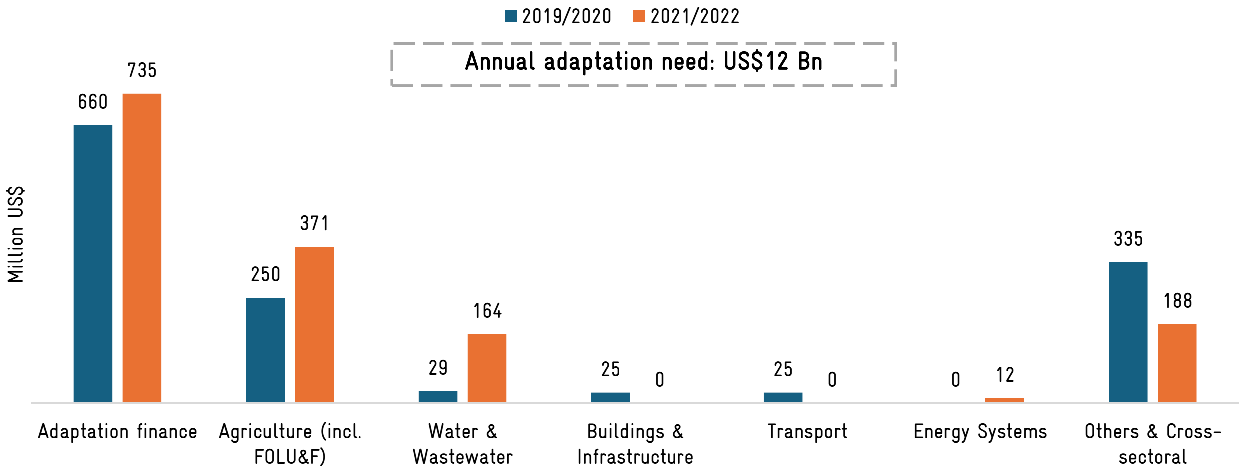
Figure 16. Estimated adaptation financing need up to 2030



Source: Author's diagram adapted from NCCC (2023b) and CPI (CPI, 2024).

Half of Nigeria's adaptation finance was channelled to the AFOLU and fisheries sector (US$ 371 million) (Figure 17). In 2021/22, 69% of Nigeria's tracked adaptation finance for the sector, amounting to $257 million, was sourced from the World Bank-funded Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL) project implemented in northern Nigeria. This initiative integrates dryland and watershed management with community climate resilience, institutional and policy support, and an emergency response financing mechanism for crisis situations (CPI, 2024). Other main adaptation strategies for the sector include promoting the use of drought-resistant seeds and expanding small-scale, solar-powered irrigation systems. Currently, these practices are underutilized in Nigerian agriculture, which remains heavily dependent on rainfall (FMARD, 2022).

Figure 17. Adaptation finance by sector vs need



Note Agriculture (incl. FOLU&F) means agriculture, forestry, land use and fisheries. Another name is AFOLU & fisheries.
Source: Author's diagram adapted from CPI (2024).

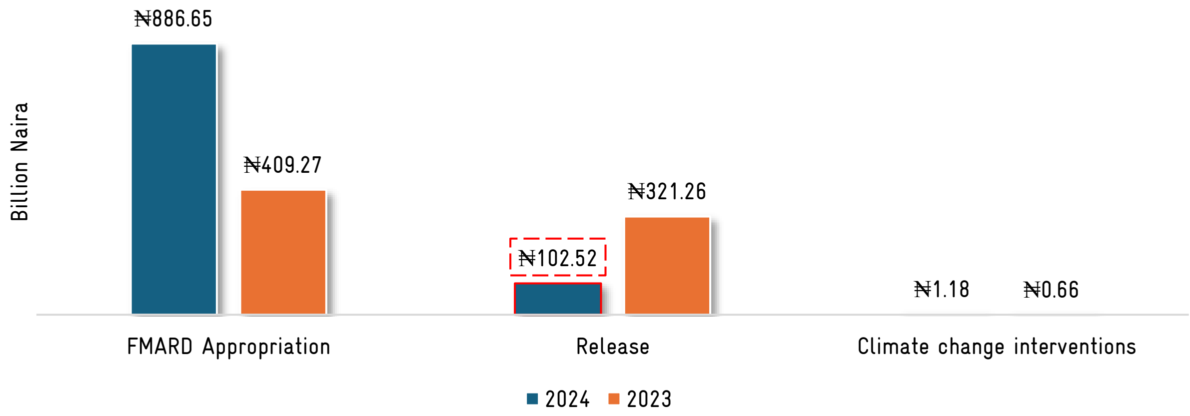
Nigeria's National Adaptation Plan (NAP) is still under development, which limits clarity on existing adaptation funding commitments. The Climate Change Act establishes a Climate Change Fund, managed by the National Council on Climate Change (NCCC), to support climate-related actions. Revenue streams for the fund include legislative appropriations, international aid, fines, and grants. These funds will finance mitigation and adaptation initiatives and other NCCC operations. Other funding efforts include the Development of Natural Resources Fund (DNRF), Ecological Fund Office (EFO), Great Green Wall projects, Clean Technology Investment Fund (CTF), Forestry Trust Fund, and Nigeria's Green Bond Market, which aims to raise $250 million for key sectors. Between 2017 and 2021, the Green Bond Market successfully mobilized $165.1 million in public and private climate finance. However, agriculture adaptation investments have received less attention, as most of the proceeds of the bonds have been channelled to the energy sector.[6]

With ongoing efforts to mobilize climate finance, Nigeria's funding landscape reveals notable imbalances, with public actors continuing to dominate climate finance provision. Multilateral development finance institutions (DFIs) account for 67% of public climate finance, remaining the largest contributors. Donor governments and bilateral DFIs also play significant roles, while multilateral climate funds—such as the Global Environment Facility (GEF), Climate Investment Funds (CIF), and Green Climate Fund (GCF)—have provided less than 1% of public climate finance in recent years. Private climate finance is led by corporations, contributing approximately 65% of the total private sector finance.

On the domestic front, public budgets are pivotal in addressing climate challenges. While Nigeria's Budget Office has introduced tools to enhance transparency and track climate-related spending, the absence of institutionalized climate budget tagging presents a significant data gap. A desk-based review of Federal Ministry of Agriculture budget data sheds light on domestic investments in climate-smart agriculture (Figure 18).

[6] https://fmdqgroup.com/greenexchange/wp-content/uploads/2022/04/Impact-Report-on-the-Nigerian-Green-Bond-Market.pdf

Figure 18. Federal Ministry of Agriculture's adaptation budget appropriations, 2023-2024



Note: 2024 release data is available for half year only. Thus, the reader is advised to cautiously interpret the information in the chart.
Source: Author's diagram from Nigeria's Annual Appropriate Acts 2023 and 2024.

In 2024, Nigeria's total budget stood at ₦28.78 trillion, with ₦886.65 billion allocated to the agricultural sector's capital budget. Out of this, ₦1.18 billion was directed toward climate-smart agricultural interventions. Comparatively, the 2023 total budget was ₦21.83 trillion, with ₦409.27 billion allocated to agriculture, of which ₦655.2 million was earmarked for climate-smart practices. This increase of approximately 81% in climate-smart agriculture allocations from 2023 to 2024 is a step in the right direction, highlighting growing recognition of climate change impacts on agriculture. However, the proportion of funds allocated to climate resilience within the agricultural sector remains marginal, at just over 1% of the capital budget in as of first half (H1) 2024.

Nigeria's agricultural sector allocations also fall significantly short of the Comprehensive African Agricultural Development Programme (CAADP) standard, which requires 10% of national budgets to be devoted to agriculture. This benchmark, reaffirmed by African Heads of State in the 2014 Malabo Declaration, indicates the sector's critical role in fostering resilience and food security across the continent. In contrast, Nigeria's agricultural budget allocations remain below 3% of the total national budget, limiting the sector's ability to address vulnerabilities exacerbated by climate change.

8. SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

This section synthesizes the key messages from the preceding sections, underlines critical limitations encountered in preparing this report, and provides actionable policy recommendations. It is designed to inform policymakers, researchers, practitioners, and wider stakeholder groups about where Nigeria stands in agricultural adaptation to climate change and how existing efforts can be strengthened to foster robust, climate-resilient growth.

8.1. Summary

Nigeria's agriculture remains central to national development, consistently contributing 24–25% of GDP since 2010 and employing a substantial share of the labour force. Despite its importance, the sector faces mounting climate risks, including rising temperatures, variable rainfall, flooding, and desertification. Projections suggest that yields in key staples could decline by up to 30% by mid-century without adaptation, which would severely undermine food security and economic stability.

The country has responded by developing numerous policy frameworks, such as the Agricultural Transformation Agenda (ATA), the National Adaptation Strategy and Plan of Action on Climate Change (NASPA-CCN), the Agriculture Promotion Policy (APP), and the Climate Change Act (2021). Most recently, the updated Nationally Determined Contribution (NDC 2021) reaffirms and expands targets to reduce greenhouse gas (GHG) emissions and strengthen adaptation in agriculture. Shared policy themes include:

- Promoting stress-tolerant seeds, including early maturing, drought-tolerant, and disease-resistant varieties;
- Expanding irrigation and water management to reduce dependence on rain-fed systems;
- Strengthening extension services and farmer outreach for better climate information;
- Scaling up credit, insurance, and other financial mechanisms to de-risk agricultural investments;
- Fostering climate-smart agriculture (CSA) for crops, livestock, fisheries, and forestry.

Nonetheless, actual performance has fallen short of policy targets. Production of staples like cassava and rice, as well as livestock outputs (e.g., cattle and poultry), has not kept pace with expected outcomes, largely due to longstanding constraints such as limited mechanization, weak infrastructure, fragmented implementation, and insufficient funding. While local and macro-level evidence (including computable general equilibrium (CGE) modelling) shows that adaptation measures can offset GDP losses and enhance sector-wide employment, large-scale adoption remains modest.

The financing gap is stark. Although the need for adaptation investments could exceed USD 12 billion annually, current sectoral allocations from domestic budgets and external financing remain low. While climate finance for Nigeria is on an upward trajectory, agriculture still receives a small fraction of the total, despite its vulnerability to climate shocks.

8.2. Conclusion

Nigeria's agricultural sector stands at a critical crossroads. The evidence in this report—covering macroeconomic analyses, sector performance data, and local case studies—confirms that climate change poses significant threats to food security, rural livelihoods, and national economic growth. Yet it also highlights that adaptation, if effectively executed, can help avert much of the projected GDP and yield losses. A combination of policy alignment, institutional reinforcement, evidence-based planning, and robust financing is required to transform existing policy commitments into tangible, on-the-ground impacts.

Multiple national documents—ranging from Vision 20:2020 through the Agriculture Promotion Policy (APP) to the more recent National Climate Change Policy (NCCP, 2021–2030) and National Development Plan (NDP)—already identify comprehensive adaptation priorities. However, the absence of a formalized, systematic system for monitoring, reporting, and evaluating adaptation outcomes hampers the ability to track progress or scale up what works. Indeed, the Nigeria's Initial Adaptation Communication (2021) underscores that adaptation assessment remains mostly ad hoc across federal, state, and local levels.

Mainstreaming adaptation into macroeconomic modelling, national development strategies (e.g., Agenda 2050), and budgetary processes will be pivotal. Doing so will ensure that agriculture's climate vulnerabilities are fully integrated into growth projections and fiscal planning, thereby providing incentives for large-scale private investment and more targeted public-sector support.

8.3. Limitations

During the preparation of this report, several constraints were identified that could limit the clarity and completeness of analysis:

Limited information on sector-specific practices and technologies

The review process revealed that policy documents and data sources often describe adaptation in broad, general terms—such as "improved seeds," "irrigation," or "early warning systems"—without detailing specific technologies or assessing least-cost approaches across distinct ecological zones.

Absence of a comprehensive baseline dataset

Assessing progress over time requires robust historical baselines and ongoing data collection. The lack of consistent, unified datasets for key indicators (e.g., yields, financing flows, climate impacts) undermines efforts to measure adaptation outcomes accurately.

Limited information on adaptation finance needs

There is insufficient granularity in how adaptation financing requirements break down—both at a national aggregate level and across sub-national or sectoral contexts. More precise data on adaptation finance is necessary to track whether commitments align with actual needs and to optimize resource allocation.

Addressing these limitations will demand inter-agency collaboration, improved data-sharing protocols, and stronger partnerships among government, research institutions, and development partners. By closing gaps in knowledge and data, policymakers can formulate clearer targets and more accurately measure progress.

8.4. Policy Recommendations

Drawing on the findings of previous chapters, the following recommendations aim to guide Nigeria toward a robust, climate-resilient agricultural sector and ensure better alignment with national adaptation goals:

1. Reinforce existing agricultural adaptation policies

Many of the necessary adaptation interventions—irrigation expansion, improved seed varieties, extension services, agricultural insurance—are already highlighted in frameworks like NASPA-CCN, NARF, NATIP, and the updated NDC. The priority now is to improve coordination and implementation. Agencies should work toward harmonising mandates, clarifying roles, and establishing accountability mechanisms within the framework of the Climate Change Act.

2. Scale up investments in irrigation, mechanization, and rural infrastructure

Rain-fed agriculture continues to expose farmers to climate shocks. Targeted public-private partnerships for irrigation development—supported by the River Basin Development Authorities—can significantly reduce vulnerability. Enhanced rural roads and storage facilities lower post-harvest losses and enable farmers to access input and output markets more reliably.

3. Strengthen extension services and knowledge dissemination

Weak extension networks hinder the widespread adoption of climate-smart practices. Strengthening extension capacity—through training, digital platforms, and stronger farmer feedback loops—will help translate policy goals into improved farm-level outcomes. Emphasis should be placed on tailoring advice for women and youth, given their critical roles in agricultural production.

4. Promote financial instruments for adaptation and risk management

Expanding microfinance, insurance schemes (e.g., livestock insurance), and other agricultural lending programs can reduce the vulnerability of farmers to climate-induced shocks. Policy incentives (e.g., tax breaks, partial credit guarantees, etc.) could encourage private-sector investments in adaptation technologies. The Climate Change Fund established under the Climate Change Act should prioritise agricultural resilience projects, particularly in frontline states.

5. Mainstream adaptation in macroeconomic modelling and development planning

Integrating adaptation considerations into macro-planning tools—like computable general equilibrium (CGE) models—will ensure that Nigeria's medium- and long-term economic projections include climate risk and resilience benefits. Explicit modelling of adaptation outcomes can better inform national and state-level budgetary priorities, attract private-sector capital, and guide donor support.

6. Improve data systems and baseline indicators

Government ministries (e.g., FMARD, FMEnv) should collaborate to design a unified system for tracking adaptation efforts, including technologies adopted, hectares irrigated, and farmers benefitting from capacity-building interventions. A transparent, consistent monitoring-and-evaluation framework, possibly tied to National Development Plan (NDP) targets, would help policymakers see where adaptation investments are working and where additional efforts are needed.

7. Address context-specific gaps and conflicts

Conflicts between farmers and herders—exacerbated by resource scarcity—reflect the urgent need for integrated land and water management. Expanding grazing reserves, supporting ranching systems, and promoting fodder production align with the National Livestock Transformation Plan (NLTP). Equally, the success stories of community-based adaptation in the Sahel and Savannah zones highlight the value of local leadership and indigenous knowledge.

8. Secure sustainable and adequate adaptation finance

Meeting Nigeria's adaptation goals, especially in agriculture, requires significantly larger capital injections. While international funding—such as through multilateral development banks and climate funds—remains essential, domestic budget allocations must also rise to at least meet CAADP's 10% benchmark for agriculture. Green bonds, innovative insurance products, and blended finance models should be leveraged to close the annual adaptation financing gap.

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Annex 1: Production and Productivity Statistics

Table A1. Crop production, area harvested, and yield, 2010-2022

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
BANANAS	Area harvested	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	476,070	525,177	540,537
	Production	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,583,830	7,388,610	8,015,978
	Yield	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.73	14.07	14.83
BEER OF BARLEY, MALTED	Production	1,760,000	1,959,600	2,400,000	2,650,000	2,700,000	2,700,000	2,600,000	1,750,000	1,800,000	1,800,000	1,880,000	1,799,800	1,818,400
BUTTER OF COW MILK	Production	10,053	12,724	12,791	12,881	13,245	11,633	11,526	11,571	11,671	11,775	11,933	11,857	11,921
BUTTERMILK, DRY	Production					2,571	2,239	2,180	2,083	2,176	2,209	2,354	2,269	2,381
CARROTS AND TURNIPS	Area harvested	25,300	25,000	26,000	26,000	26,515	26,631	26,817	26,809	26,902	26,811	26,684	26,510	26,505
	Production	219,911	217,848	227,128	227,694	232,574	233,850	235,888	236,145	237,481	237,318	237,275	236,026	236,463
	Yield	8.69	8.71	8.74	8.76	8.77	8.78	8.80	8.81	8.83	8.85	8.89	8.90	8.92
CASHEW NUTS, IN SHELL	Area harvested	382,509	337,466	294,148	168,750	126,490	131,529	132,544	140,000	140,000	140,000	167,570	170,000	170,000
	Production	791,726	562,572	412,755	192,660	99,010	97,149	98,291	100,000	100,000	101,500	91,915	90,000	90,000
	Yield	2.07	1.67	1.40	1.14	0.78	0.74	0.74	0.71	0.71	0.73	0.55	0.53	0.53
CASSAVA, FRESH	Area harvested	3,481,900	4,120,166	6,401,996	6,741,300	7,096,300	7,900,630	6,668,996	6,761,350	6,949,400	9,776,650	9,614,230	9,979,330	10,144,641
	Production	42,533,180	46,190,248	50,950,292	47,406,770	54,324,700	57,405,060	60,529,864	61,350,199	65,350,850	56,969,160	55,565,610	58,237,500	61,015,339
	Yield	12.22	11.21	7.96	7.03	7.66	7.27	9.08	9.07	9.40	5.83	5.78	5.84	6.01

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CATTLE FAT, UNRENDERED	Production	8,770	10,000	8,237	10,794	10,888	10,983	8,522	8,596	9,096	9,318	9,304	9,224	9,179
CHEESE FROM SKIMMED COW MILK	Production	8,047	10,187	10,241	10,313	10,699	9,318	9,247	9,271	9,349	9,426	9,557	9,500	9,540
CHILLIES AND PEPPERS, DRY (CAPSICUM SPP., PIMENTA SPP.), RAW	Area harvested	34,000	35,000	36,000	35,000	35,571	37,822	36,131	36,482	36,454	36,447	37,020	37,096	37,212
	Production	57,000	59,000	62,000	60,000	60,459	64,811	61,757	62,610	62,886	63,123	64,538	65,071	64,244
	Yield	1.68	1.69	1.72	1.71	1.70	1.71	1.71	1.72	1.73	1.73	1.74	1.75	1.73
CHILLIES AND PEPPERS, GREEN (CAPSICUM SPP. & PIMENTA SPP.)	Area harvested	94,808	94,368	94,929	95,491	97,338	98,503	99,836	100,792	101,817	102,728	103,362	103,297	103,915
	Production	733,631	733,207	735,765	738,324	742,884	750,105	755,960	759,150	762,632	765,623	770,467	769,728	771,845
	Yield	7.74	7.77	7.75	7.73	7.63	7.62	7.57	7.53	7.49	7.45	7.45	7.45	7.43
COCOA BEANS	Area harvested	1,272,430	1,241,329	1,266,347	1,239,750	1,144,659	1,056,893	1,048,945	892,101	950,132	885,571	1,188,468	1,003,778	1,027,173
	Production	399,200	391,000	383,000	367,000	329,870	302,066	298,029	250,000	270,000	250,000	357,608	280,000	280,000
	Yield	0.31	0.31	0.30	0.30	0.29	0.29	0.28	0.28	0.28	0.28	0.30	0.28	0.27
COCONUT OIL	Production	11,600	11,550	12,000	10,146	12,000	10,417	9,492	9,588	10,748	10,766	9,518	7,000	7,000
COCONUTS, IN SHELL	Area harvested	39,000	39,000	39,000	39,000	38,907	36,384	37,725	37,927	36,867	36,396	34,816	34,600	34,151
	Production	263,815	265,000	264,814	266,045	267,520	255,700	272,500	277,300	273,700	274,900	271,300	271,300	271,300
	Yield	6.76	6.79	6.79	6.82	6.88	7.03	7.22	7.31	7.42	7.55	7.79	7.84	7.94
COFFEE, GREEN	Area harvested	1,990	1,942	1,893	1,639	1,520	1,345	1,501	1,455	1,434	1,421	1,438	1,418	1,393
	Production	2,400	2,525	2,417	2,100	1,972	1,755	1,942	1,890	1,862	1,852	1,880	1,843	1,810
	Yield	1.21	1.30	1.28	1.28	1.30	1.30	1.29	1.30	1.30	1.30	1.31	1.30	1.30
COTTON LINT, GINNED	Production	210,900	188,200	100,700	94,400	101,600	97,100	97,600	51,000	51,000	44,000	90,000	93,000	104,000

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
COTTON SEED	Production	361,500	322,600	172,600	161,800	174,100	166,500	167,300	93,000	92,000	60,000	125,000	115,000	130,000
COTTONSEED OIL	Production	8,800	12,300	14,700	14,500	13,800	14,000	12,500	12,400	12,000	10,900	10,000	16,900	17,300
COW PEAS, DRY	Area harvested	2,859,760	3,021,175	3,481,000	3,593,300	3,701,500	3,635,700	4,814,540	5,008,440	4,909,060	4,931,320	4,973,530	5,041,990	4,894,274
	Production	3,368,250	1,643,851	5,146,000	4,630,540	2,137,900	2,306,200	3,750,470	3,874,740	4,007,830	4,064,710	4,132,850	4,213,100	4,202,328
	Yield	1.18	0.54	1.48	1.29	0.58	0.63	0.78	0.77	0.82	0.82	0.83	0.84	0.86
EDIBLE OFFAL OF CATTLE, FRESH, CHILLED OR FROZEN	Production	46,357	52,858	43,536	57,055	57,551	58,052	45,044	45,435	48,080	49,251	49,177	48,756	48,516
EDIBLE OFFAL OF GOAT, FRESH, CHILLED OR FROZEN	Production	46,025	33,646	34,692	38,178	39,132	40,112	41,113	42,141	44,163	45,505	43,815	43,879	43,911
EDIBLE OFFAL OF PIGS, FRESH, CHILLED OR FROZEN	Production	10,400	10,800	11,060	11,300	11,226	11,857	12,460	13,065	13,586	14,187	14,935	15,658	16,134
EDIBLE OFFAL OF SHEEP, FRESH, CHILLED OR FROZEN	Production	31,031	31,231	22,372	24,766	25,385	26,020	26,670	27,337	28,036	28,137	28,046	28,021	28,124
FAT OF PIGS	Production	13,000	13,500	13,825	14,125	14,032	14,822	15,575	16,332	16,983	17,733	18,669	19,572	20,167
FONIO	Area harvested	151,766	168,539	174,752	180,265	173,874	167,216	167,457	170,905	174,203	176,423	174,442	172,897	171,403
	Production	79,087	81,941	81,486	81,863	82,270	83,071	83,747	84,758	85,454	85,759	85,302	85,095	84,170
	Yield	0.52	0.49	0.47	0.45	0.47	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49
GAME MEAT, FRESH, CHILLED OR FROZEN	Production	155,000	163,000	165,000	165,000	167,951	174,653	169,201	169,843	170,576	172,100	177,870	177,124	175,252
GINGER, RAW	Area harvested	52,330	48,910	94,000	124,100	47,512	68,282	85,359	96,059	86,310	93,730	102,060	102,320	95,047

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Production	162,223	460,170	380,000	496,920	168,128	413,382	774,887	834,634	677,870	679,040	681,390	707,100	747,326
	Yield	3.10	9.41	4.04	4.00	3.54	6.05	9.08	8.69	7.85	7.24	6.68	6.91	7.86
GOAT FAT, UNRENDERED	Production	6,904	5,047	5,204	5,727	5,870	6,017	6,167	6,321	6,625	6,826	6,572	6,582	6,587
GREEN CORN (MAIZE)	Area harvested	183,916	200,000	200,000	196,876	194,151	196,782	198,630	199,241	198,650	199,167	200,170	200,386	200,977
	Production	676,338	740,000	765,000	740,569	732,455	748,287	756,634	764,414	766,469	771,556	780,334	781,714	787,588
	Yield	3.68	3.70	3.83	3.76	3.77	3.80	3.81	3.84	3.86	3.87	3.90	3.90	3.92
GREEN GARLIC	Area harvested	52	52	46	46	92	138	176	176	138	163	171	168	167
	Production	679	672	600	600	1,200	1,800	2,300	2,300	1,800	2,133	2,228	2,192	2,185
	Yield	13.05	12.93	13.04	13.04	13.04	13.04	13.07	13.07	13.04	13.09	13.03	13.05	13.08
GROUNDNUT OIL	Production	286,000	288,200	300,200	312,500	272,500	326,700	331,100	342,000	368,500	375,100	364,100	364,100	377,300
GROUNDNUTS, EXCLUDING SHELLED	Area harvested	2,789,180	2,353,680	2,659,800	2,732,700	2,799,773	2,801,756	3,458,710	3,596,850	3,759,976	3,601,541	3,620,190	3,702,210	3,400,000
	Production	3,799,240	2,962,627	3,313,500	2,474,530	3,399,158	3,467,446	4,360,500	4,521,450	4,600,000	4,357,032	4,230,560	4,227,520	4,284,000
	Yield	1.36	1.26	1.25	0.91	1.21	1.24	1.26	1.26	1.22	1.21	1.17	1.14	1.26
HEN EGGS IN SHELL, FRESH	Production	14,409,057	14,736,000	14,862,000	15,094,000	15,306,000	17,160,000	16,900,000	17,160,000	16,640,000	16,640,000	18,356,407	16,640,000	17,212,135
KARITE NUTS (SHEANUTS)	Area harvested	339,994	334,360	338,391	362,097	399,389	407,472	389,652	403,911	400,345	397,969	400,742	399,685	399,466
	Production	338,200	336,390	362,083	359,337	360,009	331,495	350,280	357,985	363,311	366,867	347,924	340,959	351,917
	Yield	0.99	1.01	1.07	0.99	0.90	0.81	0.90	0.89	0.91	0.92	0.87	0.85	0.88
KENAF, AND OTHER TEXTILE BAST FIBRES, RAW OR RETTED	Area harvested	1,000	1,000	1,000	1,000	1,003	1,007	1,010	1,012	1,011	1,013	1,013	1,022	1,025
	Production	1,331	1,351	1,390	1,390	1,418	1,451	1,477	1,501	1,524	1,546	1,569	1,546	1,554

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Yield	1.33	1.35	1.39	1.39	1.41	1.44	1.46	1.48	1.51	1.53	1.55	1.51	1.52
KOLA NUTS	Area harvested	270,143	230,000	225,000	220,000	253,088	269,823	247,637	258,790	249,847	243,168	219,892	228,699	280,559
	Production	144,950	138,000	135,000	132,000	167,686	177,011	158,899	167,865	167,745	169,203	170,462	173,825	183,405
	Yield	0.54	0.60	0.60	0.60	0.66	0.66	0.64	0.65	0.67	0.70	0.78	0.76	0.65
MAIZE (CORN)	Area harvested	4,149,310	5,456,540	5,751,300	5,762,700	6,346,551	5,550,360	5,904,906	6,389,296	6,541,183	6,783,924	6,048,600	6,205,280	5,800,000
	Production	7,676,850	8,878,456	8,694,900	8,422,670	10,790,600	9,540,190	10,532,340	10,632,299	10,934,149	12,598,945	12,403,300	12,744,450	12,948,920
	Yield	1.85	1.63	1.51	1.46	1.70	1.72	1.78	1.66	1.67	1.86	2.05	2.05	2.23
MANGOES, GUAVAS AND MANGOSTEENS	Area harvested	130,000	130,000	132,000	130,000	130,200	130,391	130,514	130,775	131,084	131,447	131,482	131,091	131,074
	Production	850,000	860,000	865,000	858,000	875,000	890,630	904,992	919,505	933,431	946,988	951,640	958,560	952,396
	Yield	6.54	6.62	6.55	6.60	6.72	6.83	6.93	7.03	7.12	7.20	7.24	7.31	7.27
MEAT OF CATTLE WITH THE BONE, FRESH OR CHILLED	Production	306,960	350,009	288,281	377,794	381,080	384,396	298,262	300,856	318,368	326,118	325,629	322,841	321,258
MEAT OF CHICKENS, FRESH OR CHILLED	Production	245,000	198,303	229,129	193,153	196,350	204,416	240,123	257,729	274,768	292,993	318,546	342,333	355,583
MEAT OF GOAT, FRESH OR CHILLED	Production	287,655	210,289	216,827	238,610	244,575	250,699	256,957	263,381	276,022	284,407	273,843	274,241	274,446
MEAT OF PIG WITH THE BONE, FRESH OR CHILLED	Production	234,000	243,000	248,850	254,250	252,574	266,788	280,354	293,973	305,692	319,202	336,046	352,298	363,010
MEAT OF SHEEP, FRESH OR CHILLED	Production	170,500	171,600	122,923	136,076	139,478	142,965	146,539	150,202	154,044	154,600	154,098	153,962	154,526
MELON SEED	Area harvested	469,690	436,833	789,177	880,836	987,615	844,650	904,367	954,189	901,068	875,163	910,140	895,457	893,587

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Production	507,340	518,875	526,572	534,001	550,246	566,672	550,306	567,306	585,085	567,566	573,319	575,323	572,069
	Yield	1.08	1.19	0.67	0.61	0.56	0.67	0.61	0.59	0.65	0.65	0.63	0.64	0.64
MILLET	Area harvested	4,364,140	2,827,090	1,328,200	1,485,200	1,574,400	1,742,803	1,737,830	1,800,069	1,734,330	1,747,800	1,762,280	1,767,390	2,000,000
	Production	5,170,430	1,271,370	1,280,700	909,560	1,846,200	1,807,810	1,487,220	1,528,250	1,879,340	1,925,075	1,905,430	1,926,950	1,941,220
	Yield	1.18	0.45	0.96	0.61	1.17	1.04	0.86	0.85	1.08	1.10	1.08	1.09	0.97
MOLASSES	Production	18,095	6,000	5,422	5,435	15,000	15,000	15,000	15,000	18,000	21,000	8,900	17,075	10,000
NATURAL RUBBER IN PRIMARY FORMS	Area harvested	213,295	194,897	176,924	150,915	137,531	133,701	136,454	138,668	146,608	149,555	136,776	150,627	153,701
	Production	79,839	73,172	66,624	57,000	52,100	50,800	52,000	53,000	56,200	56,300	51,300	57,200	58,400
	Yield	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
OIL OF PALM KERNEL	Production	106,000	92,900	98,000	105,800	109,500	112,700	115,000	124,200	134,300	139,800	146,300	150,900	163,300
OIL OF SESAME SEED	Production	6,124	22,148	176,342	90,139	55,602	49,810	80,804	92,368	64,165	51,565	33,382	32,000	30,548
OIL PALM FRUIT	Area harvested	3,200,000	3,200,000	3,250,000	3,000,000	3,114,347	3,229,848	3,312,313	3,545,307	3,735,292	3,809,946	3,891,929	4,087,000	4,323,296
	Production	8,000,000	8,000,000	8,100,000	8,000,000	8,200,000	8,300,000	8,500,000	9,100,000	9,600,000	9,790,903	10,000,000	10,500,000	11,100,000
	Yield	2.50	2.50	2.49	2.67	2.63	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57
OKRA	Area harvested	397,290	965,680	1,060,200	1,089,800	1,095,400	1,859,900	1,338,600	1,301,600	1,395,130	1,430,860	1,473,150	1,567,439	1,793,831
	Production	1,083,620	843,500	1,999,200	1,886,200	2,039,500	2,067,900	1,461,600	1,561,900	1,682,120	1,718,170	1,758,180	1,803,030	1,844,242
	Yield	2.73	0.87	1.89	1.73	1.86	1.11	1.09	1.20	1.21	1.20	1.19	1.15	1.03
ONIONS AND SHALLOTS, DRY (EXCLUDING DEHYDRATED)	Area harvested	695,345	373,450	386,300	386,300	499,000	486,410	446,500	502,800	549,890	568,225	589,610	595,850	614,042
	Production	1,346,218	716,285	899,700	899,700	1,178,400	1,219,880	1,249,500	1,346,100	1,416,960	1,464,280	1,517,270	1,534,430	1,599,296
	Yield	1.94	1.92	2.33	2.33	2.36	2.51	2.80	2.68	2.58	2.58	2.57	2.58	2.60

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ONIONS AND SHALLOTS, GREEN	Area harvested	13,232	14,000	15,000	14,000	14,000	13,944	13,965	14,091	14,235	14,388	14,238	14,287	14,304
	Production	231,684	236,000	240,000	235,000	235,000	234,550	234,068	233,832	233,681	233,635	243,770	243,540	244,843
	Yield	17.51	16.86	16.00	16.79	16.79	16.82	16.76	16.59	16.42	16.24	17.12	17.05	17.12
OTHER CITRUS FRUIT, N.E.C.	Area harvested	790,000	795,000	800,000	795,000	807,000	810,026	819,267	823,987	830,199	837,245	840,812	841,916	846,118
	Production	3,800,000	3,800,000	3,900,000	3,800,000	3,858,831	3,974,126	4,040,573	4,074,479	4,121,163	4,175,608	4,228,448	4,243,903	4,215,987
	Yield	4.81	4.78	4.88	4.78	4.78	4.91	4.93	4.94	4.96	4.99	5.03	5.04	4.98
OTHER FRUITS, N.E.C.	Area harvested	177,000	190,000	195,000	190,000	187,154	176,965	184,707	189,171	183,614	177,892	180,663	179,182	178,039
	Production	1,200,000	1,280,000	1,300,000	1,280,000	1,264,294	1,200,359	1,248,218	1,283,217	1,243,931	1,209,156	1,233,892	1,226,257	1,221,187
	Yield	6.78	6.74	6.67	6.74	6.76	6.78	6.76	6.78	6.77	6.80	6.83	6.84	6.86
OTHER NUTS (EXCLUDING WILD EDIBLE NUTS AND GROUNDNUTS), IN SHELL, N.E.C.	Area harvested	2,800	2,850	2,700	2,750	2,787	2,758	2,733	2,717	2,703	2,698	2,773	2,775	2,785
	Production	7,000	7,000	6,832	7,200	7,507	7,389	7,321	7,293	7,278	7,297	7,289	7,288	7,291
	Yield	2.50	2.46	2.53	2.62	2.69	2.68	2.68	2.68	2.69	2.70	2.63	2.63	2.62
OTHER OIL SEEDS, N.E.C.	Area harvested	400	200	200	200	200	300	300	300	300	200	200	200	204
	Production	814	450	460	460	500	600	700	800	781	529	547	538	556
	Yield	2.03	2.25	2.30	2.30	2.50	2.00	2.33	2.67	2.60	2.64	2.74	2.69	2.73
OTHER PULSES N.E.C.	Area harvested	130,000	130,000	130,000	140,000	149,254	143,411	145,735	147,496	149,941	151,872	149,770	150,527	150,723
	Production	56,000	56,000	60,000	64,000	67,281	65,032	65,992	66,780	68,007	69,436	68,074	68,506	68,672
	Yield	0.43	0.43	0.46	0.46	0.45	0.45	0.45	0.45	0.45	0.46	0.45	0.46	0.46
OTHER STIMULANT, SPICE AND AROMATIC CROPS, N.E.C.	Area harvested	3,600	3,700	3,850	3,900	4,026	4,089	4,181	4,292	4,648	5,230	6,418	9,597	11,006
	Production	5,500	5,500	6,000	6,200	6,260	6,360	6,552	6,390	7,046	8,060	10,000	15,000	17,284

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Yield	1.53	1.49	1.56	1.59	1.55	1.56	1.57	1.49	1.52	1.54	1.56	1.56	1.57
OTHER VEGETABLES, FRESH N.E.C.	Area harvested	724,335	726,854	732,698	740,311	743,340	746,913	752,114	747,456	760,614	784,523	785,171	776,769	782,154
	Production	5,998,811	6,136,054	6,309,068	6,499,588	6,714,350	6,923,418	6,712,452	7,042,308	6,892,726	7,188,190	7,041,074	7,040,663	7,089,976
	Yield	8.28	8.44	8.61	8.78	9.03	9.27	8.92	9.42	9.06	9.16	8.97	9.06	9.06
PALM KERNELS	Production	233,000	210,000	220,000	228,000	235,000	320,000	305,000	283,000	305,000	320,000	330,000	355,000	365,000
PALM OIL	Production	970,820	930,000	940,000	880,000	1,350,095	1,432,103	960,000	1,529,315	1,564,599	1,220,000	1,280,000	1,350,000	1,420,000
PAPAYAS	Area harvested	92,865	94,000	95,000	94,000	94,200	92,660	91,289	91,850	92,553	94,230	95,680	95,870	96,325
	Production	750,000	760,000	775,000	800,000	850,000	879,278	843,093	838,172	835,701	843,581	878,777	852,686	858,348
	Yield	8.08	8.09	8.16	8.51	9.02	9.49	9.24	9.13	9.03	8.95	9.18	8.89	8.91
PINEAPPLES	Area harvested	180,000	180,000	180,000	180,000	182,000	183,564	186,981	190,314	192,368	192,564	196,590	198,160	195,771
	Production	1,487,350	1,480,571	1,437,128	1,447,644	1,471,404	1,496,185	1,533,207	1,568,421	1,589,395	1,593,867	1,631,696	1,604,986	1,610,183
	Yield	8.26	8.23	7.98	8.04	8.08	8.15	8.20	8.24	8.26	8.28	8.30	8.10	8.22
PLANTAINS AND COOKING BANANAS	Area harvested	449,220	450,085	486,482	478,040	487,933	500,799	488,924	495,582	509,472	497,993	ND	ND	ND
	Production	2,675,530	2,679,796	2,954,790	2,957,046	3,018,843	3,065,945	3,110,863	3,158,912	3,213,229	3,278,168	ND	ND	ND
	Yield	5.96	5.95	6.07	6.19	6.19	6.12	6.36	6.37	6.31	6.58	ND	ND	ND
POTATOES	Area harvested	265,992	308,560	301,303	310,321	316,733	318,600	320,336	318,556	326,471	321,788	322,272	323,510	322,523
	Production	1,026,311	1,077,058	1,085,139	1,124,985	1,173,146	1,240,446	1,179,526	1,234,968	1,218,313	1,210,936	1,221,406	1,216,885	1,216,409
	Yield	3.86	3.49	3.60	3.63	3.70	3.89	3.68	3.88	3.73	3.76	3.79	3.76	3.77
RAW CANE OR BEET SUGAR (CENTRIFUGAL ONLY)	Production	38,000	12,000	10,843	10,870	15,000	16,000	23,000	25,000	30,000	20,900	17,800	34,150	20,000

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
RAW HIDES AND SKINS OF CATTLE	Production	36,961	42,144	34,711	45,489	45,885	46,284	35,913	36,226	38,334	39,267	39,208	38,873	38,682
RAW HIDES AND SKINS OF GOATS OR KIDS	Production	46,025	33,646	34,692	38,178	39,132	40,112	41,113	42,141	44,163	45,505	43,815	43,879	43,911
RAW HIDES AND SKINS OF SHEEP OR LAMBS	Production	31,031	31,231	22,372	24,766	25,385	26,020	26,670	27,337	28,036	28,137	28,046	28,021	28,124
RAW MILK OF CATTLE	Production	444,669	563,000	566,000	570,000	585,000	513,116	507,950	510,568	514,240	517,077	520,670	524,192	526,972
RICE	Area harvested	2,432,630	2,269,410	2,863,815	2,931,800	3,095,900	3,651,200	3,898,900	3,765,000	4,065,500	4,126,670	4,195,100	4,320,100	4,580,000
	Production	4,472,520	4,612,614	5,432,930	5,818,200	6,690,000	7,573,400	7,812,200	7,835,100	8,403,300	8,435,510	8,171,800	8,342,000	8,502,000
	Yield	1.84	2.03	1.90	1.98	2.16	2.07	2.00	2.08	2.07	2.04	1.95	1.93	1.86
SEED COTTON, UNGINNED	Area harvested	398,570	259,560	323,440	415,100	398,712	401,441	341,777	380,643	242,519	234,245	510,370	510,890	488,896
	Production	602,440	537,670	287,600	269,710	290,162	277,523	278,821	150,000	150,000	110,000	236,840	242,740	250,000
	Yield	1.51	2.07	0.89	0.65	0.73	0.69	0.82	0.39	0.62	0.47	0.46	0.48	0.51
SESAME SEED	Area harvested	324,570	325,000	499,100	526,900	559,900	470,100	928,467	1,012,730	785,800	782,590	351,413	511,817	340,000
	Production	149,410	229,167	994,800	584,980	434,990	432,900	593,604	632,317	522,730	523,430	195,427	440,000	420,000
	Yield	0.46	0.71	1.99	1.11	0.78	0.92	0.64	0.62	0.67	0.67	0.56	0.86	1.24
SHEEP FAT, UNRENDERED	Production	4,774	4,805	3,442	3,810	3,905	4,003	4,103	4,206	4,313	4,329	4,315	4,311	4,327
SKIM MILK OF COWS	Production	186,986	236,662	237,917	239,591	246,352	216,382	214,375	215,215	217,084	219,013	221,961	220,549	221,737
SORGHUM	Area harvested	4,960,130	4,661,867	5,099,975	5,449,200	5,702,160	5,899,134	5,472,010	5,820,000	5,628,899	5,397,000	5,799,600	5,930,900	5,700,000
	Production	7,140,970	5,690,145	5,837,106	5,300,270	6,883,294	7,005,025	7,556,076	6,939,000	6,800,000	6,665,000	6,590,600	6,725,500	6,806,370

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Yield	1.44	1.22	1.14	0.97	1.21	1.19	1.38	1.19	1.21	1.23	1.14	1.13	1.19
SOYA BEAN OIL	Production	47,700	40,700	62,700	77,300	71,700	92,100	87,000	75,300	84,300	124,500	113,500	132,300	133,600
SOYA BEANS	Area harvested	281,890	599,350	668,300	680,000	633,016	609,333	1,070,580	1,119,660	1,174,830	1,148,050	1,207,740	1,105,950	1,150,000
	Production	365,080	492,852	650,000	517,960	623,815	588,523	936,887	993,955	1,053,560	1,048,510	1,262,280	1,166,050	1,320,000
	Yield	1.30	0.82	0.97	0.76	0.99	0.97	0.88	0.89	0.90	0.91	1.05	1.05	1.15
SUGAR CANE	Area harvested	45,680	49,008	61,821	70,926	81,872	85,018	86,373	84,421	88,415	86,403	86,413	87,077	86,631
	Production	1,009,000	988,794	1,180,914	1,301,531	1,413,512	1,449,963	1,487,173	1,496,330	1,499,276	1,503,576	1,532,458	1,540,326	1,557,084
	Yield	22.09	20.18	19.10	18.35	17.26	17.05	17.22	17.72	16.96	17.40	17.73	17.69	17.97
SWEET POTATOES	Area harvested	1,298,486	1,326,447	1,332,406	1,386,114	1,506,706	1,552,692	1,481,837	1,513,745	1,516,091	1,503,891	1,511,243	1,510,408	1,508,514
	Production	3,467,073	3,516,653	3,592,440	3,676,709	3,734,749	3,857,242	3,933,480	3,987,389	4,062,466	4,143,207	4,064,354	4,090,009	4,099,190
	Yield	2.67	2.65	2.70	2.65	2.48	2.48	2.65	2.63	2.68	2.75	2.69	2.71	2.72
TARO	Area harvested	520,130	446,991	622,800	622,800	639,980	826,800	947,240	1,061,440	1,113,770	1,223,180	1,332,030	1,337,500	1,323,604
	Production	2,957,090	3,011,661	3,058,300	3,058,300	3,273,000	3,276,700	7,151,180	7,549,500	7,930,830	7,900,080	7,867,170	8,202,650	8,200,000
	Yield	5.69	6.74	4.91	4.91	5.11	3.96	7.55	7.11	7.12	6.46	5.91	6.13	6.20
TOMATOES	Area harvested	272,950	286,450	469,000	517,400	541,800	557,500	634,660	701,300	842,734	902,911	858,639	926,798	997,501
	Production	1,799,960	1,491,319	2,060,300	1,925,120	4,083,500	4,229,330	2,632,500	2,809,200	2,936,870	3,102,960	3,390,170	3,477,981	3,600,784
	Yield	6.59	5.21	4.39	3.72	7.54	7.59	4.15	4.01	3.48	3.44	3.95	3.75	3.61
UNMANUFACTURED TOBACCO	Area harvested	14,789	12,600	10,883	9,375	9,133	9,500	9,700	9,800	9,667	9,722	9,730	9,706	9,719
	Production	9,066	7,668	6,652	5,749	5,436	5,000	5,500	6,000	5,500	5,667	5,722	5,630	5,673
	Yield	0.61	0.61	0.61	0.61	0.60	0.53	0.57	0.61	0.57	0.58	0.59	0.58	0.58

ITEM	DATA	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
WHEAT	Area harvested	74,399	128,992	98,148	80,000	70,000	60,000	60,000	49,322	51,548	51,646	50,000	11,820	15,727
	Production	110,441	165,000	100,000	80,000	91,300	60,000	60,000	82,758	88,362	86,900	55,000	36,944	34,427
	Yield	1.48	1.28	1.02	1.00	1.30	1.00	1.00	1.68	1.71	1.68	1.10	3.13	2.19
YAMS	Area harvested	2,868,990	4,475,356	4,487,946	5,088,300	5,333,871	5,389,870	5,347,483	5,276,098	5,427,899	6,778,080	7,128,080	7,498,130	7,501,189
	Production	37,328,180	33,134,172	32,318,900	35,618,420	43,709,800	44,103,900	48,982,621	49,519,100	55,363,999	52,914,910	56,345,530	59,884,050	61,381,809
	Yield	13.01	7.40	7.20	7.00	8.19	8.18	9.16	9.39	10.20	7.81	7.90	7.99	8.18

Note: The data in the table represents the most comprehensive timeseries available for crop and derivatives in Nigeria.
Source: FOASTAT (2024)

Table A2. Livestock production and annual growth rate, 2010-2022

ITEM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ASSES	1,200,000	1,220,000	1,250,000	1,265,000	1,270,000	1,279,505	1,294,377	1,308,540	1,321,441	1,332,751	1,337,549	1,344,623	1,350,934
% Δ	12.7%	1.7%	2.5%	1.2%	0.4%	0.7%	1.2%	1.1%	1.0%	0.9%	0.4%	0.5%	0.5%
CAMELS	277,727	278,005	278,283	278,561	279,215	279,534	279,397	279,677	280,009	280,346	279,936	279,955	279,990
% Δ	6.8%	0.1%	0.1%	0.1%	0.2%	0.1%	0.0%	0.1%	0.1%	0.1%	-0.1%	0.0%	0.0%
CATTLE	16,577,962	19,041,270	19,206,928	19,374,029	19,753,249	20,184,763	19,884,104	20,057,095	20,240,605	20,402,276	20,585,153	20,764,244	20,901,100
% Δ	0.9%	14.9%	0.9%	0.9%	2.0%	2.2%	-1.5%	0.9%	0.9%	0.8%	0.9%	0.9%	0.7%
CHICKENS	192,313	148,893	159,254	134,839	137,240	142,895	167,510	180,073	192,525	205,697	223,704	240,481	249,864
% Δ	5.0%	-22.6%	7.0%	-15.3%	1.8%	4.1%	17.2%	7.5%	6.9%	6.8%	8.8%	7.5%	3.9%
GOATS	56,524,076	67,292,536	68,974,848	70,699,218	71,958,213	72,527,691	76,135,326	78,038,709	79,893,060	81,875,539	84,039,154	86,140,133	88,070,668
% Δ	2.5%	19.1%	2.5%	2.5%	1.8%	0.8%	5.0%	2.5%	2.4%	2.5%	2.6%	2.5%	2.2%
HORSES	101,509	101,611	101,713	101,715	101,862	102,147	102,120	102,222	102,200	102,319	102,529	102,631	102,699
% Δ	-1.0%	0.1%	0.1%	0.0%	0.1%	0.3%	0.0%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%
RABBITS AND HARES	3,838	3,838	3,991	4,151	4,370	4,599	4,669	4,856	5,067	5,262	5,461	5,680	5,891
% Δ	4.0%	0.0%	4.0%	4.0%	5.3%	5.2%	1.5%	4.0%	4.3%	3.8%	3.8%	4.0%	3.7%
SHEEP	35,519,760	38,376,024	39,335,424	40,318,809	41,284,022	41,632,158	43,418,947	44,504,420	45,609,634	46,767,182	47,926,393	49,124,553	50,304,116
% Δ	2.4%	8.0%	2.5%	2.5%	2.4%	0.8%	4.3%	2.5%	2.5%	2.5%	2.5%	2.5%	2.4%
SWINE / PIGS	7,471,730	6,282,453	6,533,751	6,795,101	6,991,989	7,368,216	7,643,563	7,949,306	8,259,938	8,562,529	8,941,888	9,299,563	9,506,487
% Δ	4.0%	-15.9%	4.0%	4.0%	2.9%	5.4%	3.7%	4.0%	3.9%	3.7%	4.4%	4.0%	2.2%

Note: The data in the table represents the most comprehensive timeseries available for livestock in Nigeria. / Source: FOASTAT (2024)