INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

IFPRI PROJECT PAPER JULY 2025

Digital Finance and Agri-Food Value Chains

Case Studies from Nigeria

Yeshua Russel

CONTENTS

1. INTRODUCTION

Nigeria's agri-food sector is one of the largest and most complex in sub-Saharan Africa, encompassing diverse crops, regions, actors, and markets. With agriculture contributing approximately 24% to the national GDP and employing over 70% of the rural workforce (CBN, nd), the sector plays a central role in livelihoods, food security, and inclusive growth. Within this sector, agri-food value chains constitute the connective tissue that links smallholder farmers, processors, traders, input suppliers, and consumers, both within the domestic economy and across international markets.

Nigeria's agricultural output is predominantly driven by staple food crops such as maize, rice, and cassava, while export-oriented value chains like cocoa provide significant foreign exchange and economic diversification potential. These chains vary widely in terms of modernization, capital intensity, and integration into digital financial services. Staple crop chains are typically domestic-facing and labor-intensive, offering high employment shares and deep linkages with poverty alleviation. Export-oriented chains, although narrower in farmer reach, tend to offer higher margins, foreign earnings, and exposure to quality standards and global market dynamics.

1.1. Value Chain Selection

In alignment with the International Food Policy Research Institute's (IFPRI) broader initiative on digitizing agri-food systems and enhancing financial inclusion, this study identified and analyzed seven high-potential value chains in Nigeria. The objective was to provide actionable insights on the performance, transformation dynamics, and digital finance readiness of these chains. The value chains were selected through a structured, criteria-based screening process grounded in both empirical evidence and stakeholder consultations.

The criteria used to select the value chains included: national importance, policy and donor alignment, employment and inclusiveness, digital financial readiness, stage of transformation, data availability and research feasibility, and market orientation. Potential value chains were scored on these criteria. These scores are detailed in the appendix. The selected value chains are rice, maize, cassava, tomato, cocoa, soybean and poultry.

1.2. Data and Resources

The analytical approach to this research was multidimensional, combining value chain analysis (VCA) frameworks with an inclusive lens on financial ecosystems and digital infrastructure. This included (a) value chain mapping to identify major segments, key actors, flows of goods and services, and supporting institutions; (b) transformation stage assessment to assess each chain for its degree of transformation based on criteria such as input intensity, mechanization, aggregation, value addition, and vertical coordination; (c) analysis of digital finance integration; (d) gender and youth analysis as a core factor, and (e) examination of profitability and value distribution along the chain.

This study leveraged a rich body of evidence, including both quantitative data and qualitative insights. First, IFPRI's extensive research on Nigeria's rice economy (e.g., Gyimah-Brempong et al., 2016), agri-food policy modeling, and financial inclusion frameworks provided foundational reference points. The value chain typologies and digital finance frameworks used were adapted from IFPRI's regional methodologies to suit the Nigerian context.

Additionally, external academic and development literature was extensively reviewed, including peer-reviewed journal articles, institutional reports (e.g., USDA, FAO, World Bank), and national strategy documents (e.g., FMARD's NRDS II). Sources such as the Nigerian Bureau of Statistics, UN COMTRADE, and Statista provided macroeconomic and trade data. To ground the findings in real-world practices and validate desk research, qualitative interviews were conducted with stakeholders across the seven value chains. These included smallholder farmers, processors, aggregators, financial service providers, agribusiness executives, and representatives of cooperatives and government agencies.

1.3. Key Findings

The study shows many commonalities among the seven value chains studied. These include a reliance on smallholders to drive production and a narrowing in the midstream. Seasonality and lack of appropriate finance options are hurdles for all value chain actors who must deal with price variations and swings in income. Contracting, market relationships, and payments are also largely informal, limiting enforcement and further blocking access to formal finance. Use of digital financial services remains low, especially among small size actors. Differences include market orientation, with most chains being domestically oriented, but cocoa being primarily export-driven. Modernization, including vertical integration, modern production technologies, and availability of services also varies widely across chains.

While the current study was focused on seven value chains, the findings have broader implications. Nigeria offers a unique testbed for studying the interplay between traditional agriculture and modern digital finance due to its population scale, diversity of agro-ecologies, depth of informal markets, and evolving fintech landscape. The presence of large agri-fintech players (e.g., Babban Gona, ThriveAgric, Crop2Cash), combined with a dynamic policy space and growing donor interest, provides fertile ground for piloting innovative financing models, inclusive market systems, and value chain integration mechanisms.

Moreover, the regional diversity of the value chains, spanning the northern maize and rice belts, the middle belt cassava and soybean zones, and the southern cocoa and poultry hubs, offers a microcosm of broader sub-Saharan African agricultural patterns. Lessons learned here can inform value chain transformation strategies across West Africa.

2. RICE VALUE CHAIN

2.1. Value Chain Characteristics

The Nigerian rice industry in 2024/2025 generated an estimated $5.62 billion in total revenue (Statistica, 2025), with domestic production contributing $3.92 billion and imports $0.68 billion. Rice production reportedly declined by 7 percent in the 2024/2025 season to 5.23 million metric tons (MMT) from 5.61 MMT in the 2023/2024 season (USDA, 2025). A gap in production and projected demand highlights a reliance on imports despite various government measures. Value added across the chain is approximately $1.85 billion, driven by milling and retail margins, though inefficiencies (e.g., low yields of 2.37 tons/ha vs. Asia's 4 tons/ha) (Kamai et al., 2020) limit potential. Dauda et al., 2014 estimates the number of jobs supported by the rice value chain in Nigeria at about 15 million.

A study focusing on rural households' youth participation in rice agribusiness value chain activities (Alabi et al., 2023) found that 78.5% of youth participants in the sector were male and 21.5% female. Adam and Bidoli (2018) revealed very distinct gender roles. Women primarily engage in parboiling (69.6%), drying (54.8%), winnowing (57.9%), fortification/additives (27.9%), and product development/diversification (26.4%). Men dominate in milling and polishing (27.8%), sorting and grading (21.1%), packaging and bagging (11.3%), and handling and transportation (28.9%). While both sexes participate in rice processing activities, women are more involved in value addition. Studies in Anambra, Kebbi, and Sokoto States also validate this (Onubogu, 2023) (Adam et al., 2018).

While rice is grown in most states in Nigeria (FAO, n.d.), the following states are the top 10 in rice production: Kebbi State, Jigawa State, Kano State, Ekiti State, Benue State, Ebonyi State, Kaduna State, Niger State, Cross-River State and Ogun State. Nigeria's rice systems include irrigated and rain-fed systems. Yields are generally higher in irrigated fields than rain-fed areas, rain-fed lands, when equipped with improved water control, can produce yields like irrigated fields.

In Southern Nigeria, the main rice planting season occurs between April and May, with harvesting taking place from August to October. An off-season cycle follows, with planting in November to December and harvesting from March to April. In Northern Nigeria, the main planting season begins in June to July, with harvesting from November to December. The off-season planting period runs from January to February, with harvesting occurring between May and June (FAO, n.d.).

The seasonal nature of rice production impacts farmers' financial needs. During planting seasons, they require capital for inputs like seeds, fertilizers, and herbicides, but limited credit access leads to a financial shortfall of 80% which in turn can cause suboptimal production. This was validated in a study by Ojo et al., (2020) which estimated the financing gaps in rice production in Southwestern Nigeria. Farmers sell their produce immediately after harvest to meet cash needs during periods like festivals, further exacerbating their financial constraints. This keeps farm gate prices low and underscores the need for financial mechanisms that allow farmers to store produce and sell at better market conditions (Longtau, 2003). During peak harvest months (October–December), consumption increases due to lower prices and greater availability. In contrast, lean periods (June–October) lead to reduced consumption or substitution with other staples (Ayoola et al. (2022) (Ohidah, 2024). Higher-income consumers maintain steady rice consumption, while lower-income households adjust in-take by reducing rice consumption or switching to alternative staples (Gyimah-Brempong, 2016).

The Nigerian rice value chain primarily serves local demand over export markets due to high consumption and insufficient local production. Nigeria's rice consumption is increasing and is expected to reach 8.3 MMT in 2025 (USDA, 2025), caused by population growth, rising incomes, and urbanization. Despite growth in local rice production, the projected 2025 domestic output of 7.9 million metric tons is short of meeting the total projected consumption needs (USDA, 2025). Nigeria relies on imports to bridge this gap and rice exports are negligible.

Key market destinations include major urban centers like Lagos, Abuja, and Port Harcourt that exhibit high demand due to substantial populations and urban lifestyles. Rice-producing states like Kebbi, Niger, Kogi, Ebonyi, and Kano serve as both production and market hubs (Eniola, 2024).

Farmers contribute approximately 49% of value addition, achieving a benefit-cost ratio of 2.02, translating to a return on investment (ROI) of 102% (Obinna and Chidume, 2020) (Hussaini et al., 2021). Processors contribute about 2% to value addition, with an ROI of 89% (Obinna and Chidume, 2020) (Hussaini et al.,

2021). Traders add approximately 36% to the value chain a ROI of 43%. While farmers contribute the most to value addition and enjoy high returns, processors and traders are also profitable.

In contract farming and outgrower schemes, millers and agribusinesses provide smallholder farmers with input, technical support, and guaranteed purchase agreements, ensuring a steady supply of rice for processors and assured markets for farmers (Akanbi et al., 2019). Interconnected mechanisms significantly enhance smallholder rice farmers' access to resources, improving productivity and livelihoods in Nigeria's rice value chain (Akintayo et al., 2024. Partnerships between organizations like OLAM and financial institutions facilitate input loans and mechanization support. Aggregators and cooperatives enable bulk purchasing of input at reduced costs, and improve access to credit and financial literacy, which positively impact farmers' financial performance (Onah et al., 2022). Innovative digital platforms like ThriveAgric, Crop2Cash, and Babban Gona connect farmers with investors, finance, inputs, and markets through technology driven solutions (Akinwale et al., 2023). Extension services and market linkages increase farmers' income by facilitating access to finance, inputs, and technology (Konkwo and Osabuohien, 2024).

2.2. Types of Actors

The Nigeria rice value chain encompasses various key and intermediary players across production, processing, and distribution, with large-scale investors and government agencies shaping its development.

Smallholder farmers constitute most rice paddy producers in Nigeria, typically operating on landholdings of less than 10 hectares (Anthony et al., 2021). Processors mill paddy rice into finished products and range from small-scale millers to large industrial processors. Marketers and traders include individuals and organizations involved in the distribution and sale of rice products, ensuring they reach end consumers.

Input suppliers provide seeds, fertilizers, and pesticides while Aggregators/collectors collect paddy rice from multiple farmers and supply them to processors. Financial institutions offer credit and insurance, supporting production and processing activities. Extension service providers train and assist farmers, promoting improved agricultural practices and technology adoption.

The rice value chain lacks a single dominant apex actor but is shaped by large-scale investors and government agencies that play roles in driving policies and providing support that influences other actors. Investors include Coscharis Farms, Olam, Quarra, WACOT Rice, and Stallion Group while key government agencies include the Federal Ministry of Agriculture and Rural Development (FMARD), the Central Bank of Nigeria, and individual state governments.

Agriculture in Nigeria is primarily driven by smallholder and subsistence farmers, that dominate rice production, though large-scale investors are becoming more involved. Oladipo and Oyaniran 2018 states that more than 80% of Nigeria's rice is produced by small scale farmers, while the remaining 20% is produced by commercial farmers. Smallholder rice farmers remain central alongside key and intermediary players whose involvement further influences the dynamics and development of the value chain.

Projecting that rice is cultivated on approximately 3.7 million hectares nationwide (Philip et al., 2018), and assuming an average farm size of 1.5 hectares, this suggests there are roughly 2.5 million rice farmers in the country. As of 2022, Nigeria had over 68 integrated rice mills with a combined capacity of about 3 MMT (WFP GAIN, 2022). Additionally, there are numerous small and medium-scale mills across the country. A recent Rentech Digital, (2025) publication indicates that there are approximately 268 rice mills

of varying sizes in Nigeria as of January 2025. To estimate the numbers for rice traders and marketers, it would be strategic to consider the extensive distribution networks required to meet Nigeria's rice consumption, which is expected to reach approximately 8.3 MMT in 2025 (USDA, 2025). It can be inferred that there are several thousand individuals and businesses involved in rice trading and marketing.

A study found that personal saving was the primary source of finance for women rice farmers, indicating challenges in accessing formal credit (Omiunu, 2014). Socio-cultural norms and limited mobility restrict women's access to profitable markets, which results in lower prices compared to their male counterparts. Women have less access to agricultural inputs and extension services, reducing their productivity (Fashogbon et al., 2023). Targeted interventions are essential to boosting women's contributions to the rice value chain and sector growth.

Membership in cooperatives like RIFAN and partnerships with Babban Gona enhances credit access, by improving collective credibility, making loans more accessible (Adegoke et al., 2023). Cooperatives procure agricultural inputs in bulk, enabling members to access them at reduced costs (Kehinde et al., 2024). This reduces expenses, ensures timely availability of inputs, enhances price negotiations with buyers, and boosts profits (Kehinde and Ogundeji, 2022). Cooperatives also improve market access by providing market data which enables farmers to make strategic sales decisions (Apata and Yusuf, 2022). Hundreds of these village-based organizations, often established with donor support, operate nationwide. Babban Gona, a notable social enterprise forms "Trust Groups" of 3 to 5 members, offering training in agronomy, financial literacy, business skills, and leadership. It provides credit, inputs, and marketing support, achieving a 99% loan repayment rate, boosting productivity and income (IFAD, 2020). The Rice Farmers Association of Nigeria (RIFAN) advocates for favorable policies, facilitates credit access, and ensures the availability of quality inputs. By organizing farmers into cooperatives, it strengthens bargaining power for better pricing and market access (Nta et al., 2024).

Interactions among actors are predominantly governed by informal transactions with significant implications for the efficiency and stability of the value chain. A study found that contract farming arrangements between small-scale farmers and agribusiness firms are often informal, with limited formal contractual agreements (Olomola, 2010). Without formal contracts, access to credit, quality inputs, and stable markets remain uncertain, leading to price fluctuations and market instability. Research on the economic implications of contract farming on small-scale rice farmers in Kwara State, Nigeria, indicated that formal contracts could provide assured markets and better pricing structures (Akanbi et al., 2019).

Cash-based transactions are predominant, especially in rural areas where banking infrastructure is limited. Bank transfers and mobile money are utilized in regions with better financial infrastructure, facilitating quicker and more secure payments. Some input suppliers and buyers offer credit services, with post-harvest repayment conditions. Commercial banks offer agricultural loans with stringent collateral, making access difficult. Microfinance banks (MFBs) are more accessible to smallholders, providing smaller loans with less stringent requirements and very high interest rates. Cooperatives pool resources to provide credit and inputs to members. RIFAN for example has facilitated access to credit for its members on a collective basis, exploring government support in some cases. Government programs and initiatives aim to link smallholder farmers with financial institutions and anchor companies to improve access to credit. However, recent low repayment levels have deterred the Nigerian government from projects like the Anchor Borrowers Scheme (Ikenga et al., 2024).

High interest rates discourage farmers from seeking loans due to the burden of repayment (Ojo and Baiyegunhi, 2020). Smallholder farmers lack the assets to meet collateral demands of formal lenders. Many farmers remain unbanked and financially excluded, limiting their access to formal credit facilities and other useful financial products (Steemers et al., 2022). These challenges cause farmers to rely on informal sources like moneylenders and family, with less favorable terms.

3. MAIZE VALUE CHAIN

3.1. Value Chain Characteristics

Nigeria is a leading African maize producer, with annual output between 10 to 13 million metric tons (MMT) (Ndoye et al, 2023, USDA, 2023), almost all of which is consumed domestically (USDA, 2023). Approximately 20% of production becomes animal feed, mostly for poultry, and the remainder going into household food and industrial uses (Wossen et al., 2023) (USDA, 2023) (PWC, 2021).

Nigeria is technically self-sufficient in maize and imports are minimal due to government restrictions (USDA, 2023). Nigeria maize import forecast for 2023/24 is between 0.1 to 0.15 MMT (100 to 150 thousand MT). Exports are negligible as the Nigerian Customes Service bans all corn exports, with only about 50 KMT informal outflow. Domestic output largely drives the market. However, it is impirtant to note that Nigeria allowed the import of maize in Q4 2024, with a temporary waiver of import duties and levies. This was part of a broader initiative to reduce food prices and curb inflation. The policy, in effect until December 31, 2024, also included waivers for rice, sorghum, millet, wheat, and beans (USDA ii, 2024). Maize prices have been quite volatile, adding additional complexity to the sector.

Maize in Nigeria is overwhelmingly produced by smallholder farmers with the following typical flow is farmer → village collector/aggregator → trader → miller/processor → end user. Nigeria's maize area spans roughly 6.5 million ha of small farms (Wossen et al., 2023), with most farmers cultivating less than two hectares of land (Chiaka et al., 2022). Accounting for family labor and seasonal hires, this implies that several million farm households depend directly on maize production. Indirectly, many more engage as transporters, traders and small-scale millers in local markets. Large commercial farms and registered agro-processors exist (e.g. major feed mills, flour mills, and agribusinesses), but they remain a minor share and are concentrated in a few states. Women provide most of the field labor and estimates suggest that between 60 to 80% of agricultural work in Nigeria is done by women (Badmus et al., 2015). Age-wise, maize farming is dominated by middle-aged adults as rural youth participation is low. Surveys in southern Nigeria found that most maize farmers were in their 30s to 50s, with fewer than 5 to 10% under the age of 30 (Badmus et al., 2015).

Maize production is heavily concentrated in the North and Middle Belt. The top-producing states are in North-West, North-Central and North-East zones and include Taraba, Plateau, Kaduna, Gombe, Niger and Borno States (PwC, 2021). By contrast, very little maize is produced in southern and coastal states. Maize is typically planted with the onset of the rainy season (around May to July) and harvested by October to November (FAO, 2025).

Limited irrigation can support extra cropping, but most maize remains rainfed. These seasonal patterns create pronounced market cycles. Harvest-time surpluses (roughly October to December) depress farmgate prices, while stocks thin out in the pre-planting "lean" months of April to August, driving prices up. Consequently, farmers face acute financing needs. Credit for inputs is needed pre-planting, and liquidity pressures after harvest often force prompt sales.

There is no guaranteed farmgate price as prices are market-driven and vary by season. Analyses show Nigeria's domestic maize price exceeds world-market parity with a Nominal Protection Coefficient of about 1.09 (VCA4D, 2022), reflecting import restrictions and strong local demand. Profit margins concentrate downstream, and one value-chain study found feed millers capture 52% of chain profits, dwarfing the earnings of small farmers (VCA4D, 2022). By contrast, farmers generated about 51% of total value added (VA) (VCA4D, 2022), but this mostly reflects input costs meaning that the absolute profits accruing to farmers are relatively small. In practice, smallholders sell at harvest to local collectors or cooperatives at modest prices, while processors and industrial users add most of the value (and profit) during milling and packaging.

Formal outgrower and aggregation schemes are relatively new but growing. For example, Babban Gona (a franchise network in Kaduna State) organizes smallholder cooperatives that receive bundled services (training, inputs, credit) from a central provider thereby boosting yields and market access (Sahel Consulting, 2017). Similarly, some livestock companies source maize directly. For instance, Dayntee Farms, a large poultry integrator in Kwara State, mills its own feed and buys about 170 tonnes of maize per month directly from Northern Nigerian farmers/traders (Sahel Consulting, 2017). These arrangements improve linkages with farmers in the network to ensure guaranteed buyers (and often input support), while off-takers secure reliable supplies.

Historically, access to formal credit has been very limited for maize farmers. Government programs aim to bridge this with the Central Bank's NIRSAL scheme guaranteeing up to 75% of the loan principal for maize-sector lending and a ₦200 billion Agriculture Credit Fund lends at 9% interest for farming/processing including maize (Sahel Consulting, 2017). Despite this, most smallholders cannot easily obtain loans. Traders rarely advance input credit unless farmers are in formal schemes (Liverpool-Tasie et al., 2017), meaning that most producers finance their own planting or rely on costly informal loans. One study reports that only 36% of maize farmers ever accessed credit which often entails bureaucratic hurdles (Makama et al., 2022)

Linkages also affect inputs. Outgrower programs and partnerships can channel subsidized seeds/fertilizers to farmers. Aggregator programs often include input distribution (e.g. Babban Gona provides inputs as part of its service package (Sahel Consulting, 2017). Despite this, many remote smallholders struggle to reach suppliers. Limited supply chains mean improved maize seeds and fertilizers often fail to reach the villages where they are needed, forcing farmers to reuse poor-quality seed and under-apply inputs.

Research describes an "hourglass" chain with tens of millions of farms at the top, a relatively small number of urban traders (around10,000) in the middle, and about 100 million consumers at the bottom (Liverpool-Tasie et al., 2017). Southern consumption centers (Lagos, Abuja, Port Harcourt) drive demand, so maize flows north-to-south via traders. Market linkages reflect this: Lagos markets feed southern industries/retail, while Kano feeds the north and manages trans-Sahel trade. Interventions (like aggregation hubs and input centers) increasingly target both regions to balance supply (VCA4D, 2022).

The maize value chain has pockets of mechanization and digital tech, but uptake is uneven. Large farmers and millers use tractors and hammer mills, while most subsistence farmers still hand-hoe and use

small grinders. The government has tractor-hire programs via state agricultural agencies, but service coverage is sparse. In the digital realm, schemes like Nigeria's e-wallet (for fertilizer subsidies) and various mobile apps/extension platforms are emerging. However, many smallholders lack smartphones or connectivity, so digital penetration is still low in rural maize belts. Overall, farmers with closer links to buyers and cooperatives tend to gain more from new tech like mechanized planting or mobile payment for inputs, whereas marginal producers lag behind (Onomu and Aliber, 2024).

3.2. Types of Actors

Value-chain actors include input suppliers, farmers (small and large), traders/aggregators, transporters, processors and millers, wholesalers and retailers (Onyibe et al., 2014). Both formal companies and vast informal networks are active.

The base of the maize value chain is dominated by smallholder farmers, accounting for about 69% of total production (VCA4D, 2022). and experiencing lower profitability with net margins of about 30%. Over 2.7 million farms cultivate less than 5 ha each (SHF1 and SHF2), accounting for roughly 58% of marketed maize (VCA4D, 2022). They typically use minimal inputs and sell in local markets at harvest. Medium (between 5 to 10 ha) and a few large commercial farms (above 10 ha) in the northern savannah contribute the rest of output (VCA4D, 2022). Large farms and outgrower schemes often access improved seeds, fertilizer and mechanization like tractors, boosting yields by about 15% above subsistence plots (VCA4D, 2022).

After harvest, maize flows through a network of traders. At the village level, micro- and small-scale collectors buy grain from farmers, often in local villages or open markets. They provide immediate cash (or credit) and bear primary quality risks. Above them are medium and large aggregators, sometimes called "coaches" or "wholesale traders". Medium aggregators collect from many small traders and carry bulk grain to city markets or storage, while large commercial buyers contract farmers or villages directly (VCA4D, 2022). For example, Olam Nigeria, a subsidiary of the global agribusiness, operates large-scale aggregation and outgrower schemes. Olam has built feed plants in Kaduna and Kwara and reports "sourcing much of its feed raw materials locally, making it the largest procurer of corn and soybean in the country" (Olam, nd).

These aggregators often provide inputs on credit via "outgrower" schemes. Under these schemes, the company supplies seed or fertilizer and guarantees the purchase of the harvest. This has enabled supported farmers working on farms of 2 to 5 ha size to raise yields by about 15% (VCA4D, 2022). As a result, supported smallholders earn a higher farmgate share of about 84% of market price, compared to 68% for unsubsidized farmers (VCA4D, 2022). Informal local traders compete vigorously even as many tons of maize move each season by small trucks to state or regional markets. Traders and warehousers are often loosely organized. Formally, commodity exchanges like AFEX and NCX began purchasing and warehousing maize, but these cover only a fraction of trade. Overall, aggregators dominate the midstream with micro and medium traders constituting the informal bulk, while formal processors and exporters comprise the upper level.

Maize transport in Nigeria is largely by road. Small grain dealers use pickups or light trucks to carry maize from farms to village collection points. Long-distance transport to major markets or ports uses heavy trucks often owned by haulage companies or cooperatives (Liverpool-Tasie et al., 2017). Despite large volume, there are few specialized grain carriers and most maize moves in general-purpose trailers or

sacks on tractors. Logistics are hampered by poor rural roads, multiple checkpoints and high costs, contributing to post-harvest loss.

The supply chain is not fully integrated: grain often changes hands several times, and formal cold-chain or storage infrastructure is limited (VCA4D, 2022). Some aggregators mitigate this by building village silos or using AgriHub storage. Some lead firms and the government have installed hermetic bags or warehouses in major producing zones to reduce losses (HarvestPlus, 2023).

Nigeria's maize is processed into several products. The largest share of 45% goes into animal feed (poultry and livestock) (PWC, 2021). Maize is the principal energy source in compound feed, so the poultry/livestock industry drives much of maize demand. Leading feed millers include Premier Feed Mills (Topfeeds) and LaFame Feeds (both Flour Mills of Nigeria subsidiaries), TopBrass Feeds, and Lacrete. These companies operate large plants and Premier Feed alone produces 260,000 t/yr at their Ibadan facility and 240,000 t/yr at their Calabar facility (Food and Beverage Outlook, 2025). These millers purchase maize in bulk and crush/grind it into meal, then mix with soy and other ingredients. These industrial buyers largely operate formally and set the market price benchmark for maize.

Beyond feed, maize is milled for food and industrial products. Flour Mills of Nigeria (via its subsidiaries) produces maize meal/flour and corn oil on an industrial scale. Breweries and confectioners use small quantities of about 6.5% for brewing (PWC, 2021). Nigeria has some large maize flour mills and many small hammer mills. Additionally, agro-processors (often women's micro-firms) produce ogi (fermented maize dough) and pap for household use.

Processed and bulk maize moves into wholesale markets before reaching consumers. Major wholesale hubs include regional grain markets in Kano, Kaduna, Jos, Abuja, Lagos (Mile 12 Farmers Market) and Onitsha, where bulk grain, flour and feed are traded. Wholesalers which are often large traders or farmer associations buy in 5 to 50 ton lots and sell to retailers or large livestock/poultry integrators (PWC, 2021). Commodity exchanges like AFEX and the Nigerian Commodities Exchange now operate warehouses in major cities for branded sales of maize under warehouse receipts, though uptake by smallholders is still emerging.

In the final leg, retailers sell maize products to consumers. This includes rural grain sellers, urban markets that sell loose corn or bagged flour), and supermarkets (VCA4D, 2022). Packaged maize meal and animal feed are found in agro-shops and farm supply stores. Open-air markets still dominate staple trade as women and "kaya-boys" sell pap (maize porridge) on the streets, while local millers grind maize for customers on demand, and small grocery shops sell 25 to 50 kg bags of maize flour. Formal retail is small, and few shoppers buy raw maize, prefering to buy processed corn flour or poultry feed.

Across these layers, both formal and informal actors coexist. Much of Nigeria's maize market remains informal: transactions are cash-based, unregulated, and rely on personal networks (VCA4D, 2022). Formal chains in the form of contract farming, agribusiness buyers, and government cooperatives are growing but still account for a minority. The success of programs like ABP/commodity exchanges hinged on strengthening formal groups.

Farmers' organizations play an increasingly important role in Nigeria's maize chain. Key groups include commodity associations, producer cooperatives, and federations that link farmers to markets and support services. The Maize Association of Nigeria (MAAN) is a national body that focuses specifically on maize. It has rapidly grown its membership reportedly from 120,000 in 2018 to 5 million in 2023 (The Junction,

2023), MAAN engages in public–private partnership (PPP) initiatives with government. It acts as a collective bargaining and advocacy platform, securing policy attention to maize, negotiating for subsidized inputs, and planning to exploit agricultural commodity exchanges and warehousing for its members. Under the CBN's Anchor Borrower Programme, MAAN often serves as the registered "farming union" that farmers must belong to in order qualify for loans/inputs

All Farmers Association of Nigeria (AFAN) is the umbrella federation of state farmers' associations with each commodity having branches under it. Many maize farmers join their state's AFAN chapter like AFAN–Kaduna or AFAN–Plateau. AFAN chapters coordinate extension meetings and liaise with government (Blueprint, 2024). Crucially, AFAN and MAAN membership is required by ABP as credit outlets like Unity Bank work through these unions to vet and distribute loans. At the community level, thousands of primary coops exist as village savings groups and farm supply cooperatives. Some states have specific maize grower unions like the Maize Growers, Processors and Marketers Association of Nigeria (MAGPAMAN) which exists in Niger State and others. Such local bodies (often under MAAN) help members source inputs, share processing equipment and negotiate farm-gate prices.

These organizations impact the value chain in several ways. By aggregating farmers, they improve access to finance and inputs. Cooperatives can buy inputs in bulk at lower cost or receive group loans under the ABP. Extension services are often delivered through cooperatives. On the output side, joint marketing raises bargaining power, and a cooperative can withhold stock to negotiate better prices or sell via an exchange, unlike isolated farmers. NIRSAL's coops can sell harvested maize through secure warehousing, whereas solo farmers must sell immediately. In government schemes, cooperatives enable targeting and the CBN and NIRSAL have made loans only to organized groups, effectively channeling credit through these associations.

4. SOYBEAN VALUE CHAIN

4.1. Value Chain Characteristics

Nigeria is West Africa's largest soybean producer and among the top producers in Africa. USDA analysts forecast Nigeria's 2023/24 soy harvest at 1.15 MMT, and 2024/25 at 1.33 MMT (ADVFN, 2023) (USDA, 2024). Domestic consumption is roughly on par with production at around 1.1 to 1.2 MMT, driven largely by the poultry and animal-feed sectors (ADVFN, 2023) (USDA, 2024). Poultry feed alone absorbs about one-third of output as soybean meals typically make up 20 to 25% of poultry rations (USDA, 2024). The remainder is processed into oil, livestock feed especially as cake or pellets, or value-added foods like soymilk, soy flour, etc. Over recent years soybean imports have been minimal while exports were negligible until recent currency shifts encouraged exports of non-GMO beans. Forecasts suggest exports may rise to 212,000 MT in 2024/25 (USDA, 2024).

Soybeans are not only important in volume but also in value. At mid-2024 prices of between $480 to $490 per tonne (CEIC Data, 2024), Nigeria's annual output translates to farm-gate revenues of about half a billion USD per year. Nigeria's growing soybean sector contributes significantly to domestic GDP and rural incomes. The crop grows roughly 1.1 to 1.3 million hectares (ha) annually with yields of about 0.9 to 1.1 t/ha (USDA/IPAD, 2025). Key producing states are principally in the Middle Belt and Northern Guinea Savanna and account for most production. USDA data indicate that Benue, Kaduna, Kano, Niger, and Taraba states alone contribute about 80% of the nation's soybean output (USDA/IPAD, 2025).

Nigeria's soybean value chain is predominantly smallholder-driven. These smallholders rely heavily on family labor and create seasonal employment for rural households. In soybean cultivation, men tend to handle field labor and land decisions, while women often do processing and post-harvest tasks. Women play critical roles in processing soy-products for local markets but face barriers such as limited land access, credit, and training. Smallholders overwhelmingly cultivate soy often as a cash crop to supplement incomes, with both men and women involved, though men dominate larger-scale production (Kamara et al., 2025) (Rural 21, 2024). In the downstream chain, thousands of jobs are created in aggregation, transport, and processing. Major processors and feed mills such as Grand Cereals, AACE Foods, Seraph Oil, Dufil Prima, among others, employ workers in crushing, refining, and packaging.

Soybean in Nigeria is a rainfed, seasonal crop. Planting generally coincides with the start of the rainy season, around May - June (Medium, 2018). The crop matures in roughly 100–120 days, with harvest typically in late summer or early fall, which is between August and September in the south, stretching into October in the north. Nigeria's climate with a mean annual rainfall of over 700 mm in main zones (Medium, 2018) is favorable for soybeans, which require sufficient moisture during flowering and pod fill. Soybeans are often grown in rotation with cereals like maize or millet or legumes like groundnut, depending on the specific agro-ecological zone. Some farmers in wetter southern areas may plant a second, smaller off-season crop, but most of the output comes from the main rainy-season planting. Crop calendars and extension guides confirm that soybeans should be planted as soon as the rains are well established, usually between May and June to maximize yield. Pests and diseases like aphids and rosette virus influence planting time and variety choice, but cropping is largely annual. Yields have improved and have started approaching 1 t/ha in recent data (USDA/IPAD, 2025) due to better varieties and inputs but remain below the global potential. Most soy produced is crushed within Nigeria evenly between oil and meal use, and virtually all oil meal is used locally as feed. Traditional food products such as soya-pap, soyabean cakes and family sauces as well as industrial oils also form smaller segments (USDA, 2024).

The market is relatively liberalized. Pricing is market-driven, with minimal tariffs or quotas on soybeans. Government intervention is modest, mainly through input subsidies or credit programs rather than price controls. Recent policy from the Central Bank of Nigeria and ministry programs encourages value-adding industries (CBN, nd), but soybean cultivation is driven by private sector incentives linked to high poultry demand and occasional price spikes. As a result, the value chain is characterized by many smallholder producers selling to a few large processors. Aggregation is informal and fragmented, creating inefficiencies. Small producers may receive only a fraction of the final value in crush oil products, reflecting costs and margins accumulated downstream.

Because most soybean farms are small, farmers rarely sell directly to end-processors. Instead, a network of intermediaries connects producers to markets. At harvest, individual farmers typically sell their grain to local collectors sometimes called "middlemen" or "rural assemblers" or cooperative groups. These collectors buy at farm-gate, provide storage, and transport aggregated loads to larger buyers. In many areas, cooperatives or farmer associations play this role, pooling members' production to achieve scale. For example, a recent private-sector partnership (2SCALE project) organized soybean cooperatives to link 15,000 farmers, including 3,200 women, with processors and input suppliers (2SCALE, n.d.).

Larger intermediaries and traders then negotiate sales with processors or feed mills. In some cases, processors or their agents run outgrower or contract schemes, supplying inputs/loans and guaranteeing purchase, effectively acting as intermediaries (NNF/DA/Propcom, 2008). Grain markets in major cities like Kano's Sabon Gari market, Oyo and Lagos also serve as aggregation hubs where wholesalers buy

soy from transporters or brokers. Finally, processors such as industrial crushers handle large volumes and sell refined products through distributors and wholesalers to retailers.

4.2. Types of Actors

The foundation of the soybean chain consists of smallholder growers. A typical soybean farmer cultivates 0.5–2 ha, often alongside other crops like maize, sorghum and groundnuts. Farmers may operate individually or as members of local cooperatives or associations (Oyenpemi et al., 2023). They decide on variety and farming practices, procure inputs sometimes from agro-dealers or suppliers bundled with credit, and market their harvest after drying. Some large commercial farms exist, but they are a small fraction of the market.

The soybean value chain involves a series of intermediaries that consolidate and move the crop from farm to end-use. At the primary collection stage, intermediaries are typically informal or semi-formal. Local grain buyers which are often men operating on supply trucks visit villages during harvest and buy soybeans on the spot, usually paying cash (PrOpCom, 2007). These buyers then bulk the grain by combining purchases from many farms. Often, these middlemen advance inputs like fertilizer or seed on credit to farmers in exchange for a pledge of harvest. A significant share of farmers experience such in-kind credit arrangements, which effectively tie them to specific buyers.

Producer cooperatives and unions can also aggregate output. Development programs have strengthened such groups. For example, the 2SCALE program worked with four soybean farmers' organizations (New Face, New Generation, Real Image, Harmony Farmers' Cooperative) to improve post-harvest handling and establish outgrower management systems (2SCALE, n.d.). These cooperatives have set up warehousing and helped members access financing, giving them greater market power. However, many farmers still rely on informal networks of village collectors, who may offer in-kind credit in exchange for guaranteed sales.

At the wholesale level, larger traders and commodities brokers handle multiple tonnes of soy. They facilitate sales between village aggregators and processing plants. In major farm states, these traders may own or lease storage facilities where beans are held until sale (NNF/DA/Propcom, 2008). In Benue or Kaduna, traders at local hub markets consolidate farmers' grain and sell to buyers from cities like Kano or Lagos. Trade is largely spot based; contractual obligations are informal.

Once soy reaches processors, it may be sold as whole bean (for small-scale home processing) or immediately crushed. The processing industry is relatively concentrated, so many intermediaries actively solicit business from farmers or villages. Some processors set up collection centers in farming regions to reduce farmers' transport burden. The chain of intermediaries, from village to national markets, thus spans local collectors, rural assemblers, urban wholesalers, and finally the processing mills (NNF/DA/Propcom, 2008). Each layer takes a margin or processing fee, which can erode farmers' share of the end-value if the chain is long and fragmented. This has led stakeholders to advocate for better coordination or infrastructure like roads and storage facilities to shorten the chain.

Based on insights gathered from expert interviews, it was observed that a relatively small number of industrial operators process the bulk of Nigeria's soy. Key players include domestic firms as well as foreign investors like Olam International. These mills crush soybeans to extract oil for edible and industrial use and produce soy meal/cake for animal feed. Many processors operate under private brand names, and some are feed millers themselves, using the cake for poultry feed production. Processors typically

contract with large buyers or feed integrators or sell through traders. Because capital-intensive equipment is required, entry is limited to significant firms. The limited number of processors means that the farmer-to-mill channel often depends on reliable relationships. Some processors engage directly with farmer groups, while others purchase from trading companies.

After processing, soybean products enter distribution chains. Wholesalers buy oil in bulk often in drums or tanker trucks, and distribute to retail grocers, fast-food chains, and industrial users like margarine factories (Food & Beverage Outlook, 2025) (USDA, 2024). Soy cake and pellet wholesalers supply large poultry integrators and feed millers (Food & Beverage Outlook, 2025). At the commodity level, traders may also buy soybeans in bulk, though this is less common now, for export or re-distribution. In the front end, commodity exchanges like the Nigerian Commodities Exchange have begun listing soybean futures or spot trades, but liquidity remains low.

At the retail end, edible soy products reach consumers through supermarkets and local markets as soybean oil, soya pap/flour, tofu, soy chunks, etc (GlobalData, 2022). Poultry and livestock farmers buy soy cake to feed animals. Thus, the value chain serves two parallel retail markets: (1) food/end-user market for household consumption of soy foods and edible oil; and (2) feed market for poultry and livestock production.

In addition to these primary actors, various support actors are critical. Input suppliers like Premier Seed, Yargus, and fertilizer dealers provide improved seeds and fertilizers occasionally with credit to farmers. NGOs and research institutions like IITA and NCRI work on variety development and extension. Financial intermediaries are beginning to serve the sector. For instance, in the 2SCALE partnership, institutions like Union Bank, Bank of Agriculture, and microfinance firms like LAPO, AL-Greiff, and Lumca provided loans to farmers and cooperatives (2SCALE, nd). Agricultural development projects also facilitate loans and subsidies.

Cooperatives, associations, and partnerships have emerged to address market weaknesses. The Soya Beans Farmers Association of Nigeria (SOFAN) and various local cooperatives organize growers for training and advocacy (Daily Trust Newspapers, 2019). Cooperatives have been known to train members in post-harvest drying and storage, secured warehouse space, and negotiated bulk sales. They have also collaborated with financial institutions to obtain loans for inputs, illustrating how collective action can leverage credit.

Well-organized co-ops can help farmers get better prices and inputs; weaker ones may exist only on paper. Many smallholders instead rely on informal “farmers groups” led by a local trader or influential farmer. These groups may serve as focal points for extension services but do not always function as true cooperatives. Overall, cooperatives in the soybean chain play roles in bulk purchasing of inputs, marketing through aggregating and selling output, and occasionally in input credit provision (AgroNigeria, 2024). Their effectiveness is growing but is still limited by governance, capital, and trust issues.

Gender dynamics in the soybean chain reflect broader rural Nigeria trends. Women’s participation in soybean farming is substantial in tasks but lower in decision-making and ownership. In the soybean sector, women often contribute labor at planting, weeding, and especially in post-harvest activities such as sorting, drying and cooking soy products. Traditional processing of soy-based foods is frequently done by women or women-led enterprises. Closing the gender gap requires addressing women’s unequal access to inputs, information, and markets. Microfinance institutions have begun targeting female farmers with specialized loan products for women’s groups, but uptake remains low (Kamara et al., 2025).

Despite challenges, there are positive trends. Female-headed households are increasingly adopting improved soybean varieties and agronomic practices when given training and support as in the N2Africa projects in northern Nigeria (Kamara et al., 2018). Associations aimed at women like Nigerian Women in Agriculture are emerging to give voice to female farmers' needs. While women are vital contributors to soybean production and processing, their role is under-recognized and under-served.

Access to credit and financial services is a critical issue in the soybean chain. Most smallholders finance their farming through personal savings, family loans, or input-traders' informal credit. Formal bank loans to soybean growers are rare, largely due to lack of collateral and high interest rates (IFPRI, 2023). Some cooperatives and NGOs have helped establish credit lines: The Bank of Agriculture and microfinance banks have extended loans to farmers in project areas. These loans may be tied to inputs and repaid after harvest. However, such credit schemes are limited in scale and often require group guarantees.

Payment transactions in the chain remain overwhelmingly cash based. Farmers typically receive cash at harvest. Similarly, buyers and processors generally pay and transact in cash or bank transfers. There are few formal mechanisms for crop finance or insurance (VerivAfrica, 2025). Some processors may offer delayed payment, but this is essentially informal credit. On the receivable side, poultry and livestock firms pay for soy meal largely by bank transfer. The introduction of warehouse receipt systems or commodity exchanges has been attempted but remains minimal.

The lack of efficient transaction channels is recognized as a bottleneck. Digital platforms have begun to enter this space: fintech firms and mobile wallets (see next section) offer farmer payments, but uptake is still nascent. Traditional moneylenders and input suppliers often charge high interest sometimes between 10% to 100% per season, for credit (VerivAfrica, 2025). Recent interventions have occasionally provided subsidized financing, but these are not soybean-specific and have mixed results. The chain's financial flows rely on low-tech, trust-based methods, which adds risk of theft and payment delays which in turn limits the ability of farmers to scale up. Strengthening formal credit linkages and transaction mechanisms remains an unmet need in the soybean sector.

5. CASSAVA VALUE CHAIN

5.1. Value Chain Characteristics

Nigeria's production of 63 million tonnes of cassava in 2021 represented about 20% of the world's total, securing its position as the leading producer (Otekurin, 2024). Nearly all of Nigeria's output serves domestic demand as cassava is a staple food in forms like garri, fufu, and flour. According to a market analysis by Data Bridge Market Research, the Nigeria cassava starch market was valued at USD $126.65 million in 2022 (Data Bridge, 2022). As a result of such massive local production levels, Nigeria remains largely self-sufficient in cassava with imports of roots being negligible and exports minimal.

Most cassava farmers are smallholders (typically less than 2 ha) using family labor (IFAD/FAO, 2005). One analysis notes cassava processors and traders number in the millions, especially since local processing is often done by women-led microenterprises (Udemezue et al., 2025). For example, the IFAD‐supported Value Chain Development Programme (2012‐26) explicitly targets 15,000 smallholder cassava and rice households, 1,680 processors and 800 traders, reflecting the cassava chain's broad

reach (IFAD, n.d.). Virtually every cassava‐growing community has farmers, day laborers, small millers, transporters, and market traders involved.

Nigeria's cassava is grown across diverse zones. In the South and Middle Belt, major producers include Ebonyi State (Ejechi et al, 2024) and the Niger Delta (e.g. Delta, Rivers, Akwa Ibom), as well as Southwest states (Ogun, Ondo, Oyo) and Southeast states (Enugu, Imo) (FAO, 2004). In the North Central, Benue and Kogi are historically top producers (FAO, 2004). Typically, planting begins with the onset of rains. In the Southwest planting occurs between April and May (Ologunde et al., 2023) whereas Northern Nigeria's single rainy season (between May and September) constrains planting to roughly May to June. Cassava is a long-duration crop: roots are usually harvested 12–18 months after planting May (Ologunde et al., 2023). As such peak harvests flood the market and depress raw root prices, while off-peak shortages drive prices upward sometime in May (Ologunde et al., 2023). Farmers report that limited access to credit is a key constraint in the cassava chain (Ejechi et al, 2024), implying that extended growing cycles heighten financing needs for labor, inputs and storage, especially between planting and sale.

Industrial uses (ethanol, starch, animal feed) are growing but are still minor relative to food uses (BusinessDay, 2025). Key urban markets for cassava products include Lagos, Abuja, and Port Harcourt, where demand for foods like garri and cassava flour is highest. Large processors (e.g. cassava flour mills, ethanol plants) exist but are few; most processing is done by small mills or even artisanal methods in villages. Pricing varies along the chain. Farmgate prices are low and negotiated locally, while wholesale and retail prices increase with processing and transportation costs. There is no dominant "apex" buyer; instead, farmers sell to local collectors and intermediaries, often on open market prices, who then supply larger traders or processors. As a result, the cassava chain remains mostly informal. Any formal contract‐farming or organized off-take arrangements are limited and fragmented, so market forces and spot pricing largely determine producer revenues (Wossen et al., 2024). This decentralized structure means that the value chain's growth depends heavily on improving efficiency and linking smallholders to markets.

Despite huge domestic demand, high-value processing lags behind full potential. For example, the demand for high-quality cassava flour for bakery and other uses is 500,000 MT/yr but local supply is less than 15,000 MT (Onyediako and Adiele, 2022). Similarly, Nigeria imports most of its starch and has almost zero ethanol production from cassava. These gaps underscore that most cassava stays in low-value form as staple food.

Relationships between farmers and intermediaries vary by region. In some areas, farmer cooperatives or aggregator networks form the interface. For example, cooperatives may supply bulk cassava to a local mill for processing. However, many producers still sell independently, outside any structured association. Access to finance, inputs and technology depends on these linkages and farmers in cooperatives or contract schemes may get improved cuttings or fertilizer on credit from processors, whereas isolated farmers rely on cash from local traders. Overall, the cassava chain in Nigeria shows growing, but incomplete, integration and we find that smallholders can benefit from closer ties to processors and buyers, though most still operate in cash markets with minimal formal support (IFAD/VCDP, nd) (IFAD/FAO, 2005).

5.2. Types of Actors

The cassava value chain comprises smallholder farmers, local aggregators/traders, processors (millers and manufacturers), and retailers/consumers. By far most cassava is grown by smallholders (many in southern states like Benue, Anambra, Ogun, Rivers) on farms under 2 ha) (IFAD/FAO, 2005). A few large

farms and estates exist, sometimes planted for industrial projects or government anchor schemes, but they represent a tiny share.

Local collectors and middlemen perform much of the intermediation: a village trader might buy roots from many farmers and deliver them to a town mill or trader. Formal contracting is uncommon (IFAD, 2004). The chain is dominated by thousands of micro/small operators, with no single firm controlling flows. Aggregators and wholesalers play a crucial role in linking producers to markets, often facilitating the movement of cassava products from rural areas to urban centers (Donkor et al, 2022).

On the processing side, the spectrum ranges from hand grinding and mortar‑pestle cassava flour in villages to mechanized flat‑batteries (hammer mills) in towns. Large industrial processors, for starch, flour, or ethanol, are very limited. Most processing is by village or town‑level small mills owned by private entrepreneurs. Some processors may offer credit or loans (in inputs or cash) in return for secured supply, but enforcement is weak.

Several farmer groups and associations are active, aiming to improve input access and bargaining power. The Industrial Cassava Stakeholders Association of Nigeria (ICSAN) brings together processors and some larger farmers to advocate for the industry (ICSAN, nd). At the grassroots, state-level cassava growers' cooperatives exist (often supported by research institutes like the National Root Crops Research Institute (NRCRI) or development projects), though their impact is mixed. Cooperatives can help members access credit or subsidized inputs. However, many farmers are not organized, and credit largely flows through group‑based microfinance or informal lenders. In marketing, groups can aggregate volumes, but formal price contracts remain rare. Overall, associations play an emerging role but are not yet universal; smallholders often rely on traditional networks or personal deals.

Across major cassava-producing regions, gendered labor divides are consistent with men and women contributing at different nodes. In Nigeria, men often handle land preparation, pest management and transportation to distant markets, while women do a large share of the planting, weeding, harvesting and especially processing and marketing (Donkor et al., 2022). Studies consistently find that women dominate cassava processing and marketing tasks, while men are more engaged in the cultivation side. For example, women are heavily involved in peeling, fermenting, grinding and selling cassava products (Udemezue et al, 2021) (Olaomo and Molnar, 2022). In one study, rural women participated in nearly all processing activities (grinding, drying, packaging) at much higher rates than men (Udemezue et al, 2021). A survey by IITA noted that "more women were involved in the marketing phase" while "more men were in the processing node" (Olaomo and Molnar, 2022), indicating women tend to be traders and marketers. Women typically occupy the less profitable segments of the cassava value chain, like small‑scale milling and local sales, whereas men, often with more capital, might run larger mills. This gender division means women are crucial actors handling laborious processing.

Despite their central roles, women face significant constraints. A survey in Makurdi (Benue) found that women's cassava plots were smaller on average, limiting scale economies (Agada et al, 2018). Female cassava processors often have lower educational levels and fewer assets than men. Importantly, women lack equal access to inputs and finance. One study notes that cassava is especially important to women, but they face severe barriers to credit and inputs (Akaniyene et al., 2023). Similarly, in an Oyo/Benue study, women cited lack of hired labor, poor infrastructure and high equipment costs as key constraints (Olaosebikan et al., 2019), reflecting limited ability to mechanize or transport produce. In Delta State only 6.7% of female cassava farmers had accessed any credit versus 16.0% of men (Nwandu, 2022), and 80% of farmers both men and women alike, identified inadequate agricultural credit as a major constraint

Cassava stakeholders draw on a mix of financial sources, each with limitations. Formal banks lead formal lending. Interest rates offered by formal banks are high, often between 10 to 15%+ (Okoruwa et al., 2020) and they favor larger firms or aggregate farmers with collateral especially men-led enterprises. Rural smallholders seldom meet banks' requirements. Public lenders usually target agriculture chains. The CBN's Cassava Bread Development Fund which was launched in 2008 disbursed ₦3.44 billion to the cassava chain (50% loan/50% grant) at a subsidized 5% interest (CBN, 2020). These programs expand access but often target program-registered farmers, leaving out unsubsidized smallholders.

Many rural producers rely on cooperatives and thrift societies. Microfinance institutions also extend small loans to agribusinesses, though amounts are limited, averaging a few hundred naira. Formal MFIs hold a small share of rural credit, and credit union membership among cassava farmers is low.

Some fintech startups have products aimed at smallholders, but the uptake in cassava farming is still marginal. One emerging model is digitized input distribution like Cellulant's e-wallet, rather than direct farm credit (Alabi et al, 2016). Agricultural insurance exists to protect yields, but penetration in cassava is very low due to high premiums and awareness gaps.

6. COCOA POTATO VALUE CHAIN

6.1. Value Chain Characteristics

Nigeria is one of the world's leading cocoa producers and exporters. Production reached roughly 300,000 metric tons in 2022 (ICCO, 2023), making Nigeria the fourth-largest cocoa exporter globally and cocoa the nation's top non-oil exportable commodity (NEPC, n.d.). Export earnings have surged recently, with Nigeria exporting about US$489 million in cocoa beans in 2022 (Adeleye, 2024). Official data show cocoa exports (premium and standard beans) totaled ₦356.1 billion (about US$0.76 billion) in 2023 (The Junction, 2024) (Adeleye, 2024). This export boom comes as world cocoa prices hit record highs, peaking at around $8.52/kg in mid-2024. As a result, the sector's contribution to the Nigerian economy is large

Domestic processing and consumption remain limited. An estimated 90% of Nigerian cocoa output is exported as unprocessed beans (Manufacturing Africa, n.d.), with most domestic manufacturing concentrated in small cocoa-beverage or confectionery units. Thus, the sector relies heavily on foreign markets for value addition. Top importers of Nigerian cocoa include the Netherlands (38.7% of 2022 exports), Indonesia (21.4%), Malaysia (18.0%), and Canada (6.0%) (Adeleye, 2024). Global demand trends such as rising chocolate consumption and pricing cycles directly affect Nigerian farmgate prices and revenues.

Cocoa farming is a major rural livelihood. Approximately 300,000–350,000 smallholder farmers cultivate cocoa across Nigeria (NEPC, n.d.). and a Nigerian agricultural news analysis notes that cocoa provides "millions of jobs" in the predominantly rural southwest (Medium, 2025). Most of these are small farms of between 1 to 3 ha each (Faloni et al., 2022) in southern states. Beyond farming, employment arises in various other segments of the value chain.

Demographically, cocoa farmers tend to be older adults. Surveys indicate average farmer ages to be between 50 and 60 years (ICCO, 2023), reflecting an aging workforce with limited youth involvement. Women constitute a significant share of the labor force, especially in post-harvest activities. Gender-disaggregated studies show women often perform fermentation, drying and bean-sorting, while men handle tasks like pod-opening, transport and cash transactions (Maduka et al., 2023). However, women are under-represented among farm owners. Data on youth participation is sparse, but analysts warn that

farm populations are aging rapidly. Overall, cocoa farming remains a labor-intensive activity relying on family labor and hirings in remote areas.

Cocoa is grown mainly in Nigeria's humid tropical zone. Key grower states include Ondo, Osun, Cross River, Oyo, Ekiti, Ogun, Edo, Abia and several others (Faloni et al., 2022). These states span south-western and south-central Nigeria, which receive ample rainfall. Nigeria's climate allows a relatively long cocoa season with trees flowering with the start of rains and producing pods through most of the year. Farmers typically harvest in staggered cycles. Production generally runs October through June (NEPC, nd), leveraging the rainy season which peaks between May to July and the following dry season. The main crop harvest usually peaks in the late dry season, which is roughly between November and January, while a smaller mid-season crop may be obtained around May–June. Outside these specific windows, yields drop. Because production is almost entirely rainfed, supply is highly seasonal. In high season there is often a glut of beans, which can depress local prices and strain buyers' cash flow, whereas in lean months farmers' liquidity is tight. Credit needs typically peak during the off-season. Agricultural research agencies have noted the need to replace ageing farms. In 2022 Nigeria's Cocoa Research Institute (CRIN) distributed 300,000 hybrid seedlings to farmers in 13 states (Adeleye, 2024) to boost replanting.

The export flows are dominated by large buyers: most beans are shipped to Europe and Asia via major trading houses. Pricing in the chain is largely spot-market based. Farmgate prices are negotiated at harvest and typically paid by Local Buying Agents (LBAs) or cooperative unions. When world prices rise, exporters can offer higher farmgate rates. Conversely, farmers face volatility during price downturns (Ajetomobi, 2015). Historically, Nigerian farmers earned a small share of final value, often receiving prices well below origin prices in Europe. Recent years have seen substantial farmgate increases, but detailed pricing data are scarce. Generally, since the market is very informal, there are few fixed "prices" set by regulation; farmers usually accept cash offers from LBAs or local traders.

Intermediary relationships are hierarchical. and Local Buying Agents (LBAs) play a crucial role. They purchase 80% of farmers' output (Adeleye, 2024) and link them to exporters. Farmers often prefer LBAs because they pay promptly and sometimes offer slightly higher prices than cooperatives (Adeleye, 2024). LBAs frequently provide inputs or credit to farmers on loan to be repaid in beans. On the next tier, exporters and processors purchase cocoa from LBAs. Exporters such as Olam, Starlink, Tulip and WACOT account for about 70–80% of LBA purchases (Adeleye, 2024), sending the bulk to international markets. Domestic processors compete for the remaining 20–30%, but their off-take is limited by lower prices and capacity. Thus, the chain has a few dominant players: large exporters and allied LBAs form an oligopoly controlling most flows, while farmer cooperatives and small traders have much smaller shares.

6.2. Types of Actors

Nigerian cocoa is produced almost entirely by small-scale farms. An estimated 95% of output comes from smallholders, typically farms of 1–3 ha each (Faloni et al., 2022). These farmers cultivate cocoa as either a sole crop or alongside food crops. They bear most production risks such as weather, pests, price and supply the raw beans at village level. The average smallholder has modest capital and labor, so productivity can be low without external support. The ecosystem includes input suppliers, extension services, and regulatory bodies such as the Cocoa Research Institute of Nigeria (CRIN) for research and the Governments marketing committees.

Licensed Buying Agents (aggregators) are private traders licensed by the government who buy cocoa at farm-gate. LBAs have relationships with many farmers in an area, providing inputs or loans in advance and then purchasing the harvest (Oluyole, 2017). Each LBA may aggregate from hundreds of farmers. They serve as critical intermediaries, passing beans to processors or exporters. 80% of cocoa beans flow through LBAs.

Few exist processors exist in Nigeria. In 2022, about 60,000 MT of cocoa were processed by this limited set of mills (ICCO, 2023), well under capacity. These companies produce cocoa butter, powder and paste for export or local confectionery. Most are private or joint-venture firms with some linked to international cocoa companies. Because processing capacity is small, most cocoa bypasses this step and is exported raw.

Exporters are larger trading firms that ship beans abroad. Major names include Olam Nigeria, Starlink Global, Tulip Cocoa, Ideal Limited, Olatunde International, WACOT, Johnvents Nigeria and others (Associated Press, 2023). Many have multinational ties and are affiliates of Europe/Asian trading houses. They buy through LBAs or cooperatives and handle quality certification and logistics. Olam Nigeria and Starlink together exported 150,000 MT of beans in 2022 (ICCO, 2023). Contracts in this structure are largely informal. There are some formal arrangements in the case of supply contracts for certified or Fairtrade cocoa, but these serve only a minority of farmers.

There is a very minimal formal wholesale/retail stage. Most beans are exported or processed immediately. While some small traders may re-sell cocoa to local processors or informal markets, local retail chocolate/chocolate drink manufacturers are virtually non-existent as domestic consumers mainly import chocolate products.

The main farmer organizations are CFAN and CAN. CFAN is an umbrella for smallholder communities in all cocoa regions. It was created to unify scattered cooperatives and advocate for farmers' needs towards achieving better credit and 100% sustainable premium cocoa. CFAN's membership spans Ondo, Osun, Ekiti, Oyo, Abia, Kogi, Ogun, Akwa Ibom, Edo and other cocoa states (CFAN, n.d.). CAN, which was originally a government Cocoa Marketing Board offshoot, now functions as an industry association divided into six zones covering all cocoa areas (CAN, n.d.). These bodies provide coordination and representation by liaising with government and sometimes organizing trade events. CAN's membership even includes exporters, processors and financial institutions.

Many farmers belong to small village co-ops or "cooperative societies" that can aggregate beans (Kehinde and Ogundeji, 2022). When harvest comes, cooperatives might sell to LBAs or larger cooperatives but cannot generally pay farmers quickly without outside financing. One study notes that cooperatives settle only 20% of produce and struggle to match LBAs' buying power (Adeleye, 2024). On credit and inputs, some cooperatives bulk-buy seed or fertilizer for members, improving access slightly. Others run joint processing ventures as very few can operate presses. Overall, associations like CFAN and CAN play a crucial coordinating and lobbying role, but farmers still rely heavily on informal networks and LBAs for finance and market access.

Both men and women work on cocoa farms, but duties are sharply gendered. Men typically handle land preparation, spraying, land-clearing, and labor contracting, while women perform harvesting, pod opening, fermentation, drying and to some extent) local marketing (Maduka et al., 2023) (Future Agricultures, 2020). Women are often unpaid family laborers whose significant contributions are under-recognized (Fasakin et al., 2023). Studies have found women's involvement in key post-harvest tasks was high, but men as the "recognised face" of the business almost exclusively deliver beans to buyers and collect cash

(Maduka et al., 2023) (Future Agricultures, 2020). In patrilineal custom, women rarely inherit cocoa land and typically can only farm via marriage or purchase. Lack of land ownership denies many women collateral and bargaining power, reinforcing a “male crop” stereotype and limiting women’s control over income.

Empirical surveys in Southwest Nigeria show men score significantly higher on credit access and extension outreach; in one study the mean credit‑access score was 0.05 for men vs. 0.01 for women (Fasakin et al., 2023). Correspondingly, cooperative membership and formal financing are skewed toward men. For instance, 64.6% of male cocoa farmers belonged to cooperatives versus 57.8% of females (Maduka et al., 2023), and men reported more channels for finance.

Cash remains king in Nigerian cocoa trade. At the farmgate, sales are overwhelmingly paid for on a cash on delivery basis (ICCO, 2023). Standard Purchasing Season prices are fixed (“ruling price”) and paid in cash as farmers deliver wet beans to buying points (ICCO, 2023). Digital payments are nascent with some licensed buying agents now piloting mobile or electronic transfers for graded lots, but these remain the exception (ICCO, 2023) (CBI, 2024). Mobile-money initiatives exist such as MTN MoMo trials for cocoa in Nigeria, but uptake in remote villages is very low: and only about 2% of cocoa farmers globally report ever receiving payment via digital channels (CBI, 2024).

At higher levels of the chain, transactions shift to formal instruments. Licensed exporters and grinders often use letters of credit (L/C) or cash-against-documents for international trade. Within the domestic chain, in-country buyers may pay via bank transfers to large suppliers, but only after collecting and processing the beans.

In Nigeria’s cocoa belt, most farm credit comes from private and community channels rather than banks. An analysis found LBAs supply roughly 47% of farmers’ credit needs through informal advances, often interest-free or in-kind (ICCO, 2023). Cooperatives and farmer associations account for another 20% of credit. Other smallholders may borrow from richer neighbors or informal moneylenders amounting to 10% for each source (ICCO, 2023). Formal financial institutions play a tiny role as banks deem cocoa farming to be “high risk” and generally avoid lending at farmgate. When available, commercial banks will lend only at high interest (around 25% annually) and require strong collateral (ICCO, 2023). Microfinance banks also lend to cocoa groups, but at steep rates (roughly 5% per month, or 60% per year. Development banks and DFIs. often channeling aid funds, may offer single-digit rates, but their reach is limited (ICCO, 2023).

Moneylenders charge exorbitant rates as high as 180 to 240% annual (ICCO, 2023), but LBAs/coop loans usually carry no cash interest, relying instead on farmer loyalty and crop collateral (ICCO, 2023). Credit is mostly used for inputs and about 78% of loans go to buy fertilizers and pesticides, with the balance funding wages and household needs (ICCO, 2023).

The cocoa value chain faces severe credit gaps and inefficiencies. Key bottlenecks include lack of collateral and complex loan procedures that exclude many smallholders (Future Agricultures, 2023) (Oladoyin et al., 2025). High interest and short repayment periods also deter farmers. Oladoyin et al., 2025 found that farmers cited “complexity and high cost of formal loans” as reasons they prefer local savings and peer lending. Local community savings groups remain the predominant source of cash credit at the village level (Oladoyin et al., 2025). Other constraints include irregular supply (farmers need cash after harvest), poor storage (forcing quick sales), and weak rural infrastructure (limiting banking outreach). Limited market information further disadvantages farmers during transactions.

Development studies consistently find that easing credit barriers boosts cocoa yields and incomes. For example, one analysis showed farmers with both cooperative membership and loan access had significantly higher productivity than those with no access (Kehinde and Ogundeji, 2022). Côte d'Ivoire and Ghana have moved toward formalizing farmer payments (e.g. cocoa exchanges), but Nigeria's chain remains largely informal. Experts recommend strengthening cocoa cooperatives, expanding mobile-money services, and simplifying loan requirements to bridge the $200+ billion agricultural finance gaps in Nigeria (Oladoyin et al., 2025) (Kehinde and Ogundeji, 2022). Policy measures under discussion include warehouse-receipt financing, e-wallet subsidies, and rural agent banking networks.

7. TOMATO VALUE CHAIN

7.1. Value Chain Characteristics

Nigeria is one of the world's top tomato producers, but demand often outstrips supply. Estimates vary, but fresh tomato output is projected to be between 1.8 to 3.6 MMT per year. A major food-security study reports roughly 3.4 million tonnes produced in 2020 (JICA, 2024), whereas earlier accounts cited between 1.8 to 2.3 MMT local production and a significant consumption gap (Tobe and Vuillaume, 2017) (Sahel Consulting, 2024).

Domestic demand is driven by tomato's ubiquity in Nigerian cuisine as it is central in the preparing of dishes like jollof rice, stews, sauces, soups, and many more. It is estimated that domestic demand for tomato is somewhere between 2.3 to 3.3 MMT annually (Tobe and Vuillaume, 2017) (Sahel Consulting, 2024). As a result, Nigeria is simultaneously Africa's second-largest producer of tomatoes and one of the largest importers of tomato products (FAO, 2025), especially tomato paste.

In 2020, Nigeria imported about 168,000 MT of tomato products (mainly paste) which represented roughly 4% of local tomato supply (JICA, 2024), which would be valued in millions of dollars. The Nigeria tomato paste retail market alone is estimated at approximately $500 million (UNDP, n.d.). Local tomato processing is limited with only 20% of Nigeria's harvest being industrially processed (FAO, 2024). Most tomatoes are sold fresh and post-harvest losses in the tomato value chain in Nigeria can reach up to 50% (FAO, 2024). In monetary terms, the overall tomato sector is a multi-hundred-million-dollar industry; the combined value of farmgate output, wholesale trade, and processed products runs into the low hundreds of millions of USD annually, though precise totals are hard to pin down. Import substitution policies (such as the 2017 ban on fresh/paste imports) have aimed to increase domestic revenue capture.

The tomato value chain is labor-intensive and largely rural. Smallholder farmers are the backbone of this system, with roughly 200,000 households mostly located in 12 states, growing more than 1.8 MMT of tomatoes every year (Tobe and Vuillaume, 2017). A typical farmer's holdings are small and may be in fractions of a hectare. Counting farm workers, transporters, traders, and processors, the sector employs well into the hundreds of thousands. For instance, Nigeria's Hand-in-Hand investment platform notes roughly 282,000 beneficiaries in proposed tomato projects in the country (FAO, 2024). This implies that between 200,000 and 300,000 people are directly involved as beneficiaries in the tomato value chain. Many of these are seasonal farm laborers (often hired men) during peak periods. Large processors such as Tomato Jos in Kaduna each employ a significant number of workers (Olodo, 2024).

In regions like Kano State, the average age of producers is approximately 44 years, with a significant proportion being male and married. Processors, including those in hotels, restaurants, and industries,

have an average age of 41 years. They play a vital role in adding value to tomato products. Marketers, comprising rural assemblers, wholesalers, and retailers, have an average age of 44 years. They are crucial in ensuring the distribution of tomatoes from producers to consumers. Transporters, with an average age of 43 years, facilitate the movement of tomatoes across different regions, ensuring timely delivery and reducing post-harvest losses (Suleiman et al., 2024) (Sani et al., 2023)

On the trading side, thousands of small-scale middlemen, market traders, and vendors are engaged in distribution. While fieldwork is male dominated (RSM2SNF, 2022), women are heavily involved in post-harvest handling, local selling and retail. An agribusinesses report that 60% of their partner farmers are female (UNDP, n.d.).

Studies indicate a male dominance in production activities. For instance, in Abuja's Municipal Area Council, 69.2% of tomato farmers were male, with men primarily handling tasks like land clearing (51.8%) and staking (31.3%) (Ajibade et al., 2021). Women are more involved in processing and marketing activities. In Abeokuta North, 76.7% of tomato marketers were female, highlighting women's significant role in the distribution segment (Osunmakinde, et al., 2023)

There is a disparity in educational levels among actors. Only 38.5% of input dealers had formal education, while most other actors attended informal education systems (Suleiman et al., 2024). A significant proportion of actors are married, which may influence labor availability and decision-making processes within households. Engagement in cooperatives varies. In Sokoto, 72% of marketers were members of cooperative associations, while none of the farmers were members (Mohammed et al., 2021) (Kabir and Abbas, 2024)

Nigeria's tomato production is predominantly concentrated in the northern regions, where climatic conditions are favorable for cultivation. The top tomato-producing states include Kano State particularly in the Danja Local Government Area, which is recognized as the largest producer of tomatoes in Nigeria, with a potential output of 776,025 metric tons annually, Jigawa State, Kaduna State, Katsina State, Nasarawa State, Benue State, Lagos State, Plateau State, Oyo State, and Ogun State (ESSFeed, 2025) (especially the Northern ones) benefit from suitable agro-climatic conditions, including hot and dry weather with sandy loam soils, which are ideal for tomato cultivation (RSM2SNF ii, 2023).

In regions relying on rainfall, tomato planting typically occurs at the onset of the rainy season (April to June), with harvesting between July and September. This cycle is limited to one season per year due to the dependence on natural rainfall. Areas with access to irrigation can support two planting seasons annually. The dry season planting occurs from November to January, with harvesting between February and April. This system allows for increased production and can help stabilize supply during off-peak periods (Usman and Bakari, 2013). The duration from planting to harvest varies depending on the tomato variety, climate, and care, typically ranging from 60 to 90 days (AgricBusiness, 2024)

During peak harvest periods, especially in the dry season, there is an abundance of tomatoes in the market. Conversely, during the rainy season, supply diminishes due to challenges like increased pest infestations and diseases, leading to scarcity. The seasonal nature of tomato production leads to notable price volatility. For instance, in May 2024, the price of a basket of fresh tomatoes in Lagos surged by over 100% due to seasonal fluctuations and reduced supply. Such price hikes are common during the rainy season when production is low (NairaMetrics, 2024).

7.2. Types of Actors

In Nigeria, tomato production is predominantly undertaken by smallholder farmers, who cultivate less than 2 hectares of land. These farmers are responsible for most of the country's tomato output. They often rely on traditional farming methods, face challenges such as limited access to quality inputs, and are vulnerable to post-harvest losses due to inadequate storage facilities (Ugonna et al., 2015). Aggregators play a crucial role in the tomato value chain by purchasing tomatoes from multiple smallholder farmers, consolidating the produce, and supplying it to wholesalers, retailers, or processors. They often provide immediate cash payments to farmers, which is essential for farmers' liquidity, but this system can also lead to price exploitation due to the farmers' limited bargaining power.

Initiatives like Tomato Jos have emerged to bridge Nigeria’s tomato supply and demand gap. Tomato Jos operates an integrated model, working with smallholder farmers to improve yields and quality, and processes tomatoes into paste locally (World Vegetable Centre, 2021). This approach not only adds value but also reduces post-harvest losses and import dependency. Wholesalers purchase large quantities of tomatoes from aggregators or directly from farmers and distribute them to retailers or processors. They are pivotal in determining market prices and ensuring the steady flow of tomatoes from production areas to consumption centers.

Retailers, often operating in open markets or roadside stalls, sell tomatoes directly to consumers. In regions like Oyo State, studies have shown that tomato marketing is dominated by female retailers, highlighting the significant role women play in the retail segment of the value chain (Sodeeq et al., 2021). Large-scale commercial tomato farming is limited, primarily due to challenges such as inadequate infrastructure, limited access to finance, and high post-harvest losses.

Membership in agricultural cooperatives has been shown to significantly enhance farmers' access to credit. A study on the impact of cooperative membership on tomato yield in Nigeria found that "access to credit service" had a positive and significant impact on farmers joining agricultural cooperatives. This suggests that farmers perceive or experience better access to credit through cooperatives (Akinola et al., 2023). Research indicates that cooperative members produce yields approximately 9.4 times higher than non-members, attributed to better access to resources, training, and market information (Akinola et al., 2023). Cooperatives often facilitate bulk purchasing of inputs like seeds, fertilizers, and pesticides, reducing costs for individual farmers and ensuring timely availability. While specific national-level tomato cooperatives are limited, regional and local cooperatives play a significant role in supporting tomato farmers (Farming Farmers Farm, 2024)

The Nigerian tomato value chain is predominantly characterized by a decentralized structure, with no singular apex actor exerting overarching control. While large-scale processors exist, their influence is limited due to the fragmented nature of the supply chain and the dominance of informal market players. Notably, wholesale traders and aggregators play a pivotal role in connecting farmers to markets, often dictating terms of trade and influencing pricing mechanisms. This decentralized structure, while offering flexibility, often leads to inefficiencies and challenges in standardizing quality and ensuring consistent supply (Egyir et al., 2022).

The tomato value chain in Nigeria is heavily skewed towards informal transactions. Approximately 95% of food distribution occurs through informal markets, with verbal agreements and spot transactions being the norm (CBI, 2021). Formal contract-based relationships are rare.

Women play a significant role in Nigeria's tomato value chain, particularly in post-harvest activities. Their involvement spans processing, trading, and transportation. Despite their substantial involvement, women often operate in informal settings, limiting their access to resources and formal recognition. They also often struggle to secure loans from formal financial institutions (Sahel Consulting, 2023). Market Access Issues caused by cultural norms and mobility restrictions can hinder women's ability to access broader markets, limiting their customer base and profitability. Training and extension services are usually unavailable to women, affecting their productivity and ability to adopt improved practices.

Farmers typically receive cash from collectors or truckers at harvest (often bundled in bundles of naira) (RSM2SNF ii, 2023). Wholesalers may pay farmers in person, or farmers transit to the city to sell and get paid at the market. Bank transfers are rare as most actors have no formal account. Mobile money adoption is minimal, so digital transfers have not yet taken hold. When possible, some processors pre-finance inputs (seeds, fertilizers) through credit schemes, recovering costs by deducting from future crop payments. Microfinance institutions and agri-focused programs such as the Central Bank’s Anchor Borrowers Programme have targeted some tomato growers, but coverage has been patchy. In practice, traders often extend short-term credit advances in cash or in kind to trusted farmers. Payment modalities reflect trust networks as long-term buyers might be allowed “pay later” arrangements, whereas unknown parties demand full cash up front. Mobile point-of-sale (POS) or e-wallet use in markets is negligible. Financial flows are simple and informal and cash changes hands directly, with only emerging examples of digital transfers (via mobile money) or cheque payments at the top tier.

Informal credit systems, including loans from relatives, friends, traders, and money lenders, are prevalent among tomato farmers. These sources are often more accessible than formal financial institutions but can come with high-interest rates, sometimes exceeding 100% annually. Such informal arrangements, while filling a critical gap, may not provide the necessary capital for significant investments in farming operations (Onuk et al, 2018)

Formal financial institutions, such as commercial banks and microfinance banks, provide limited financing to tomato farmers. Challenges include stringent collateral requirements, high-interest rates, and a lack of tailored financial products for smallholder farmers. Government programs, like the Central Bank of Nigeria's intervention through the National Association of Tomato Producers, offer loans in cash and kind to smallholder farmers. These loans often come with favorable terms, such as single-digit interest rates, and aim to boost local tomato production (CBN, nd).

Value chain financing, where buyers provide inputs or credit to farmers with repayment through produce, is emerging as a financing model. However, its adoption is limited, with only about 6.5% of farmers accessing this form of credit. This model can offer more flexible financing options aligned with the production cycle (Steemers et al, 2022).

High-interest rates and stringent collateral requirements by formal financial institutions deter many tomato farmers from seeking loans. These conditions are often unattainable for smallholder farmers, limiting their ability to invest in productivity-enhancing inputs and technologies.

8. POULTRY VALUE CHAIN

8.1. Value Chain Characteristics

Nigeria's poultry sector is a major agrifood industry. Domestic production has expanded rapidly, but it still falls far short of demand. In 2022 Nigeria produced roughly 355,000 metric tons of chicken meat (Helgilibrary-i, n.d.) and 664,000 metric tons of eggs (Helgilibrary ii, nd). By some estimates local output covers only about 30% of domestic demand (CSIRO, 2020). The Nigerian poultry sector is estimated to be worth approximately $4.2 billion in total value, making it one of Nigeria's biggest industries after the services sector (Oyedijo and Akenroye, 2023) (Netherlands Ministry of Foreign Affairs, 2020).

Per-capita consumption remains very low (around 1–2 kg of poultry meat per person per year and roughly 78 eggs per person per year (Akpan and Nkanta, 2022), reflecting high unmet needs. Poultry farming (including eggs) contributes substantially to Nigeria's agricultural economy, on the order of 20–25% of agricultural GDP (Orji and Iheonu, 2023), and the sector is estimated at over ₦12 trillion in annual output (PAN, 2023). For context, one analysis found that raising Nigeria's egg industry to full domestic capacity could generate N800 billion (about$1.9 billion) per year (Akpan and Nkanta, 2022),

Much poultry meat still reaches Nigerian consumers via imports (often unofficially). After a 2003 ban on chicken imports and frozen products, domestic flocks expanded, yet surveillance data show that between 2009–2011 over 3 million tonnes of poultry products were imported into the Republic of Benin and largely smuggled into Nigeria (Sahel Capital, 2015). This effectively made domestic consumption roughly 1.2 million tonnes per year despite the ban (Sahel Capital, 2015). This import dependence has constrained value-chain growth by exposing local farms to global competition while investment and modernization lag. Despite abundant arable land and rising demand, repeated shocks (currency devaluations, feed shortages, disease outbreaks) have kept domestic supply below national need.

Poultry farming is a significant source of employment in Nigeria with one authoritative fact sheet reporting that approximately 85 million people participate in poultry production (CSIRO, 2020). The Poultry Association of Nigeria claims a total of 20 million jobs (combined direct farm and related jobs) exist in the value chain (PAN, 2023). Egg production alone is said to support the livelihoods of over 10 million households across Nigeria (Akpan and Nkanta, 2022). Beyond the farm, processors, feed producers, transporters, wholesalers, retailers and market traders also rely on poultry trade, so the indirect workforce is substantial. Young broiler birds are hatched, raised, slaughtered, distributed, and sold through a chain of hatcheries, feed mills, abattoirs, and markets. Overall, poultry is one of the largest livestock sub-sectors in Nigeria (CBN, n.d.), creating livelihoods for rural and peri-urban communities on a vast scale.

Poultry farming in Nigeria is widely practiced across gender and age groups, though detailed statistics are sparse. Qualitative and programmatic evidence suggest women play a key role, especially in small-scale production and marketing. Women frequently serve as farm laborers, traders and caregivers of backyard flocks, while youth drive many small- and medium-scale poultry ventures. Poultry production is more developed in the south-western part on the nation, but with rapidly increasing investments in the North West and North Central geo-political zones (Masaki et al. 2020)

Nigeria's poultry industry is predominantly active in states such as Oyo, Ogun, Lagos, Plateau, Kaduna, and Delta. These regions benefit from favorable agro-climatic conditions, established infrastructure, and proximity to major markets. Urban centers such as Lagos, Abuja, and Port Harcourt serve as major markets due to their substantial populations and demand for poultry products (Liverpool-Tasie, et al., 2017).

The production cycles in these areas are largely influenced by climatic seasons. During the rainy season, higher humidity and moderate temperatures contribute to increased egg production and hatchability rates (Ingweye and Meinderts, 2021). For instance, a study in Delta State (Guobadia, 2021) reported average egg production and hatchability rates of 74% and 80.6%, respectively, during the wet season, compared to 53.7% and 55.9% in the dry season.

The rainy season often leads to a surplus of poultry products, resulting in lower market prices. Conversely, the dry season, particularly during festive periods like December, sees heightened demand and reduced supply, causing price surges. These seasonal patterns necessitate adaptive financial strategies for poultry farmers (Pullus Africa, nd). During periods of surplus, farmers may require financial support to manage inventory and mitigate losses due to lower prices. In contrast, the high-demand dry season may require increased capital to scale up production and meet market needs. Access to flexible financing options is thus crucial for sustaining operations throughout the year.

The domestic market is characterized by a diverse range of products, including fresh, frozen, and processed chicken, distributed through various channels such as retail outlets, foodservice establishments, and industrial applications (Renub Research, nd). Pricing structures across the value chain are influenced by factors like production costs, supply-demand dynamics, and seasonal variations. For instance, prices tend to surge during festive periods due to increased demand. However, comprehensive, peer-reviewed studies detailing specific pricing structures across the entire value chain are limited.

The poultry sector faces several challenges that hinder its ability to meet domestic demand. In 2023, over 50% of poultry farms in Nigeria ceased operations due to escalating production costs, particularly the rising prices of maize, a primary component of poultry feed. This downturn resulted in losses exceeding ₦3 trillion across the value chain (Nairametrics, 2024). The scarcity of essential inputs and inadequate infrastructure further exacerbate production shortfalls. The lack of ISO-certified enterprises and inadequate national-level regulation hinder the competitiveness of Nigerian poultry products in global markets (Oyedijo and Akenroye, 2023).

A study conducted in Kaduna State provides the following insights into the distribution of value addition among actors in the broiler chicken value chain (Sani et al., 2023). Producers contribute approximately ₦24,081.30 per 100 birds per production cycle, accounting for about 47% of the total value added. Input suppliers add around ₦4,094.30 per 100 birds, representing 8% of the value addition. Traders contribute approximately ₦15,593.20 per 100 birds, making up 31% of the value added. Processors add about ₦7,428.40 per 100 birds, which is 15% of the total value addition.

The same study reports the following ROI for each actor: Producers get an ROI of 1.16. Input suppliers receive a ROI of 1.06. Traders get a ROI of 1.14. (Sani et al., 2023). Processors achieve an ROI of 1.11. These ROI figures suggest that all actors in the broiler chicken value chain are operating profitably, with producers and traders achieving the highest returns on investment.

Contract farming and outgrower schemes have been instrumental in integrating smallholder poultry farmers into the broader value chain. For instance, Akwa Prime Hatchery and Poultry Limited operated an outgrower scheme in Akwa Ibom State, providing farmers with day-old chicks, feed, and technical support, along with guaranteed buy-back arrangements. This model ensured a steady supply for processors and assured markets for farmers, enhancing productivity and income stability (Unoh et al., 2019). Agricultural extension services play a crucial role in enhancing smallholder participation in the poultry value chain. These services offer training in best practices, business management, and technical production, which are essential for improving productivity and product quality.

8.2. Types of Actors

Smallholder farmers dominate Nigeria's poultry sector, accounting for a significant portion of the national production (FAO FGN USAID, 2020). These producers typically operate with limited resources and face challenges such as access to finance, quality inputs, and markets (Abanigbe et al., 2024). In contrast, large-scale producers, though fewer in number, have better access to capital, technology, and organized markets, enabling them to operate more efficiently and at a larger scale. Efforts to integrate smallholder farmers into the broader value chain, such as through cooperative societies and value chain development programs, aim to enhance their productivity and market access.

Wholesalers purchase large quantities of poultry products from aggregators or directly from producers and sell them to retailers. Retailers, including market vendors and shop owners, sell poultry products to end consumers. Processors transform live birds into processed products, such as frozen chicken, for distribution to various markets. Processing facilities range from small-scale operations to large industrial plants (Killebrew et al. 2010). Input suppliers include providers of day-old chicks, feed, veterinary services, and equipment. They are essential for the sustainability and productivity of poultry farming (Killebrew et al. 2010).

There is no single apex player dominating Nigeria's poultry value chain. The sector is characterized by a fragmented structure with numerous smallholder farmers and a few emerging large-scale enterprises. A study analyzing the broiler value chain in Kebbi State identified key actors as input suppliers, farmers, processors, and traders, all operating independently without a central coordinating entity (Adeyonu et al., 2020). While companies like Agricorp International are making significant investments to scale operations, such as a ₦4 billion investment across Kwara, Kogi, and Nasarawa states aiming to produce 40 million birds by 2025 (Vanguard, 2021), these efforts represent approximately 4% of the projected annual demand and do not equate to market dominance. Nigeria’s poultry industry features several large integrated farms operating alongside thousands of smallholder producers.

Farmer cooperatives and trade unions play a pivotal role in Nigeria's poultry sector. Notable among these are the Poultry Association of Nigeria (PAN) and various regional cooperatives. These organizations facilitate access to credit, inputs, and market information for poultry farmers. A study (Adewuyi et al., 2024) indicates that 37% of poultry farmers accessed credit through cooperatives, 19.8% from commercial banks, 18% from microfinance banks, 2.5% from the Bank of Agriculture, 6.2% from government sources, and 12.3% from private organizations. This underscores the significant role cooperatives play in providing financial support to poultry farmers in the region. Informal transactions dominate the sector; however, there has been a gradual increase in formal contractual relationships, with reports indicating an 11% rise in formal contracts with suppliers and a 13% increase with customers (Liverpool-Tasie et al., 2021)

Women play a significant role in Nigeria's poultry industry, particularly in small-scale production and marketing. Despite their contributions, they face challenges such as limited access to finance, land, and training. Studies reveal that women contribute 60% of the labor force in agriculture but own only 1% of farm assets (Adinya et al., 2013).

A study in Akwa Ibom State (Okorie et al., 2024) revealed that the main sources of credit among the poultry farmers were family and friends (40%), cooperative (25.3%), commercial banks (22%), bank of agriculture (8%), microfinance bank (2.7%), online borrowing (1.3%) and religious group (0.7%). The result of the regression showed that age was positively related to poultry farmers’ access to credit while household size, farming experience and educational level were negatively related to poultry farmers’

access to credit in the study area. A separate study in Rivers State found that 60% of smallholder poultry farmers accessed institutional credit, with cooperatives being the most common source (40.74%), followed by microfinance banks (28.4%), government agencies (17.28%), and commercial banks (13.58%) (Elum and Obiajunwa, 2022).

Nationally, the situation is more constrained. According to the National Agricultural Sample Census (NBS, 2022), only 7% of farming communities reported receiving micro-credit from banks. However, about 24% of communities reported the availability of credit facilities from cooperative organizations, indicating a preference for cooperatives over conventional banks due to less stringent collateral requirements.

Several factors hinder poultry farmers' access to credit. Approximately 30.3% of farmers cited the absence of collateral as a significant barrier (Okorie et al., 2024). About 27.2% of farmers were deterred by unreasonably high interest rates (Adewuyi et al., 2024), 12.1% faced loan denials, and another 12.1% struggled with inadequate documentation (Adewuyi et al., 2024). 8.1% encountered rigorous application processes that discouraged them from pursuing loans (Okorie et al., 2024). These constraints often lead farmers to rely on informal credit sources, which may not provide sufficient capital for scaling operations.

Financial transactions within the poultry sector are predominantly cash-based. However, there is a gradual shift towards digital payment systems, including bank transfers and mobile money platforms. This transition is influenced by the broader adoption of fintech solutions in Nigeria, such as OPay, Moniepoint and PalmPay, which offer rapid and convenient transaction services. Despite their advantages, these platforms have faced scrutiny over regulatory compliance and data privacy concerns. The adoption of digital transactions is more prevalent among larger-scale poultry operations, while smallholder farmers continue to rely heavily on cash due to limited access to digital infrastructure and financial literacy.

9. CONDITIONS FOR DIGITALIZATION

Nigeria's agricultural sector is undergoing rapid digital transformation. Digital financial services (DFS) are increasingly being adopted to bridge access gaps in finance, markets, and technology. Across the country, DFS platforms offer farmers new opportunities to receive payments, access credit, and reduce transactional inefficiencies. However, these gains are unevenly distributed across the rice, maize, cassava, soybean, tomato, cocoa, and poultry value chains. Each value chain faces distinct challenges and enablers for digitalization and financial inclusion, shaped by infrastructure, digital literacy, trust in platforms, and value chain organization. This section explores current DFS adoption, the drivers enabling uptake, barriers hindering growth, and emerging opportunities by examining both shared and value-chain-specific dynamics across the seven focal commodities.

9.1. Current Use of Digital Payments

Digital payment systems are expanding across Nigeria. The volume of mobile money transactions rose by over 50% between 2023 and 2024, and POS terminal usage surged, especially in urban centers (Fintech Magazine Africa, 2025). Despite these national trends, adoption within agricultural value chains is still patchy.

In the rice value chain, digital usage remains limited. POS systems are more common among urban-based processors, while rural areas still largely depend on cash transactions. In Kwara State, 80% of maize farmers own smartphones, yet only 6.7% use e-wallets, with 60% using phones for agricultural purposes. DFS usage remains low due to high data costs, poor internet, and expensive smartphones

(Olatinwo et al., 2024). For cassava, transactions are overwhelmingly cash-based. A CGAP/CTA study found 96% of cassava farmers had never used mobile money despite 95.6% owning mobile phones (CTA, 2019). Traders and processors are beginning to adopt digital payments, but smallholder participation remains minimal. Tomato farmers similarly rely on cash, especially in rural northern Nigeria. In Jalingo, 90% of tomato actors lack bank accounts, with 96% using cash and only 36% using POS for transactions (Adikwu et al., 2024) The cocoa sector is among the least digitized. Only 2% of farmers reported receiving payments digitally (CBI, 2024), with 78% never using the internet for business (Agbongiarhuoyi, 2020). Traders and cooperatives still deal largely in cash, with digital finance adoption trailing behind. In the poultry value chain, DFS usage is growing faster than in crops due to urban-based operations. Formal processors and input suppliers increasingly use bank transfers and digital loans. However, in rural poultry systems, cash remains dominant. A study in Abuja found only 30% of poultry farmers accessed credit from formal institutions, with the majority relying on cooperatives (Adeyonu et al., 2017).

9.2. Drivers of Digital Financial Service Adoption

Several systemic drivers have boosted DFS in Nigerian agriculture. National policies like the National Financial Inclusion Strategy (NFIS), Cashless Nigeria (CBN, n.d.), and the Digital Economy Policy (2020–2030) have provided enabling frameworks. Programs such as the Anchor Borrowers Programme require digital account linkage, nudging farmers toward DFS platforms. Poultry actors benefit from schemes like Heifer International's PoS-DerP (NAN, 2024) and NIRSAL-backed funding mechanisms like the N1 Billion facility extended by Polaris Bank to an integrated poultry in Rivers State (NairaMetrics, 2023).

Development interventions continue to facilitate DFS adoption through various channels. The Cocoa value chain receives limited DFS support but pilot traceability and biometric payment projects like the Zowasel traceability pilot with Barry Callebaut, which registered over 600 smallholder cocoa farmers across Ondo, Cross-River, and Akwa Ibom, are emerging (Medium, 2023). With help from USAID, AyosifamHub connected cassava farmers in Kwara to mechanized tools, finance, digital training, and buyers, improving processing and sales (Ayosifam, nd).

Fintech firms like OPay, PalmPay, and Crop2Cash provide mobile wallets, credit scoring, and embedded payments, offering value-added services beyond simple transfers (GSMA, 2024). These innovations lower costs and extend services to underserved farmers. In the rice value chain, agritech platforms linking farmers to processors have improved transparency and fostered DFS use (Sanusi et al., 2025). iSDA’s Virtual Agronomist, an AI-powered agronomic advisory supports 2,000+ maize farmers in Niger State to increase yields and income via real-time digital insights (ISDA, 2025).

Widespread mobile phone ownership, 93% of adults (EFInA, 2023) and growing 3G/4G penetration improve access to DFS. Smartphone use, while still limited among rural farmers, is increasing steadily. The rise of BVN and NIN systems enhances KYC processes and account opening, facilitating easier onboarding of farmers into formal finance systems (Biometric Update,2023). Agent banking networks are also growing. Over 2.7 million POS terminals have been deployed (The Guardian, 2024), helping to bridge access gaps. Agent banking has expanded into semi-urban and some rural areas, supporting mobile transactions.

9.3. Barriers to Digital Financial Service Adoption

Despite these advances, barriers remain. These barriers include poor rural electricity and network coverage limit digital engagement. This can affect all value chains, depending on the regions in which activity

is concentrated (The Cable, 2025). Many farmers also lack the skills to use digital tools. For cassava and tomato farmers, studies report only ~30% have adequate digital finance knowledge (Kolapo & Didunyemi, 2024). Moreover, DFS adoption is often siloed. For example, rice farmers may receive loans digitally but sell output for cash. Without full value-chain integration, DFS impact is limited.

Transaction fees and device affordability are also significant. High USSD charges and POS fees deter smallholders, particularly in low-margin sectors like cassava and tomato (EFInA, 2025). Women, especially in rice and poultry chains, face compounded exclusion due to limited phone access, low financial autonomy, and identity documentation gaps (Chinelo and Ayodeji, 2023). At the same time, frequent shifts in fintech regulation (e.g., temporary bans on onboarding by the CBN in 2024) create uncertainty and slow innovation. Incomplete enforcement of consumer protection rules also undermines trust (Techeconomy, 2024). Cumbersome KYC, poor interface design, and lack of vernacular options reduce usability. For cocoa and cassava farmers with low literacy, IVR/USSD solutions are still underutilized. Additionally, currency volatility and inflation disincentivize digital savings. Farmers in volatile sectors like maize and tomato prefer cash to avoid devaluation.

Fraud and platform failures also deter adoption. In 2024, banks reported a 65% surge in fraud cases (Secondstax, 2024). Across all sectors and regions, users cite fears of scams and overcharging by agents (Leadership, 2024). SIM swap scams, phishing, and agent fraud create fear. Rural agents often lack oversight. In EFInA's 2023 survey, 2.3 million adults reported fraud by agents.

Digital finance holds transformative potential for Nigeria's agriculture sector. While national infrastructure and fintech ecosystems are maturing, uptake remains uneven across value chains. Addressing the barriers specific to each commodity, from poor connectivity in cocoa zones, low digital literacy in cassava regions, to price volatility in tomato markets, will be critical to scaling DFS adoption. A targeted, value-chain-sensitive strategy, combining public investment, fintech innovation, and farmer training, can close these gaps and ensure inclusive digital transformation of Nigeria's agricultural economy.

10. CONCLUSION

This study presented a comprehensive analysis of seven strategic agri-food value chains in Nigeria: rice, maize, cassava, tomato, cocoa, soybean, and poultry. Collectively, they represent the diverse orientations, levels of modernization, and structural configurations that define Nigeria's agri-food system today. The research has surfaced both cross-cutting themes and value-chain-specific dynamics, offering an evidence base for policy, investment, and future research.

Despite their differences, several structural and operational characteristics were consistent across the value chains studied. This includes the fact that across all chains, production is predominantly led by smallholder farmers cultivating less than five hectares. In rice, maize, cassava, and tomato, smallholders account for over 70% of total output. Even in export chains like cocoa, small-scale producers remain central, underscoring the importance of targeting this group for productivity and inclusion interventions. The studied value chains also reveal an "hourglass" structure, a wide base of dispersed producers, a narrow midstream dominated by a few aggregators or processors, and a broad downstream of urban consumers or export markets. This bottleneck in the midstream limits producer margins and creates market power asymmetries that often disadvantage smallholders.

Across the board, seasonality in production cycles leads to predictable periods of financial stress. Farmers frequently need liquidity for input procurement during planting and face cash flow pressures immediately after harvest. Access to timely, affordable credit is limited, leading to suboptimal input use, post-harvest losses, and forced sales at disadvantageous prices. Additionally, contract farming, aggregation schemes, and market relationships are largely informal. In all value chains, from cassava and maize to cocoa, verbal agreements and trust-based arrangements dominate. This limits enforceability, reduces investment incentives, and constrains access to formal financing.

Women play substantial roles in post-harvest handling, processing, and retail across most chains, particularly in rice, tomato, and cassava. Yet, they face systemic barriers to land, finance, extension services, and market access. Female-headed households consistently manage smaller plots and access fewer resources than male counterparts. Youth engagement is variable but generally limited in upstream production. While younger actors are more visible in entrepreneurial nodes like logistics, processing, and digital services, constraints in land access, capital, and perception of agriculture as “low-prestige” inhibit broader youth participation.

While mobile phone penetration is relatively high, actual usage of digital financial services (DFS), such as mobile money, digital credit, and e-wallets, remains low across chains, especially among producers. DFS adoption is higher in downstream segments where processors and traders operate and in export-oriented or urban-adjacent chains. Infrastructural constraints, digital literacy gaps, and trust issues remain pervasive.

While commonalities exist, key divergences in value chain structure, modernization, and inclusion potential emerged. Market Orientation is one of these factors. Cocoa is primarily export-driven, shaped by international standards and external demand. Conversely, rice, maize, cassava, and tomato cater mostly to domestic markets. This orientation influences investment patterns, regulatory focus, and the structure of incentives across actors.

The level of modernization also varies. Cocoa and Poultry show relatively higher levels of vertical integration and the adoption of modern production techniques. Rice and maize exhibit transitional characteristics, while cassava and tomato remain largely traditional, with low levels of mechanization, value addition, and coordinated processing. Chains such as rice have more advanced fintech and agri-tech engagements, with platforms like Babban Gona, Crop2Cash, and ThriveAgric providing bundled services. In contrast, cassava and maize show minimal DFS penetration beyond basic mobile communication.

Value distribution is uneven across chains. For instance, rice farmers capture high returns (102% ROI), while maize value disproportionately accrues to downstream actors like feed processors. Cocoa offers higher per-unit margins, but access to these markets is restricted by entry barriers such as certification requirements and aggregation costs.

Value chains also cluster differently across Nigeria’s regions. The rice and maize belts are concentrated in the North and Middle Belt, while cassava, tomato, and poultry are prevalent in the South and Middle Belt. Cocoa is a niche crop in select ecological zones. This spatial distribution has implications for infrastructure development, logistics planning, and regional policy targeting.

Finally, chains like tomato and cassava have high female participation across stages, while others like cocoa exhibit male dominance, especially in production and trade. Even in chains with strong female presence (e.g., rice parboiling), access to credit, extension, and decision-making remains skewed.

This joint value chain assessment reinforces Nigeria's strategic role as a high-impact country for future investment and research. The diversity of chains, maturity of agri-fintech ecosystems, regional contrasts, and policy activity provide fertile ground for pilot models in value chain upgrading, digital finance, and inclusive growth. Nigeria's agri-food value chains are at a pivotal moment. With the right mix of policy alignment, investment, and innovation, they can transition from fragmented, informal networks to dynamic engines of food security, rural employment, and digital inclusion, not only for Nigeria, but for the broader region.

A. APPENDIX

Value Chain Selection Matrix											
Criteria	**Sub-Criteria**	RICE	COCOA	MAIZE	CASSAVA	PALM OIL	AQUACULTURE	SOYBEANS	COWPEA	TOMATO	PINEAPPLE
Value Chain Structure	**Vertical Integration:**	8	7	6	5	7	6	5	4	5	4
	Horizontal Integration:	7	6	7	6	6	5	6	5	6	5
	Level of Formality:	6	7	5	4	6	5	5	4	5	4
	Infrastructure & Market:	8	6	7	5	6	5	6	5	6	5
	Value Addition:	7	8	6	5	7	6	5	4	6	5
	Innovation & Technology Adoption:	6	7	5	4	6	6	5	4	5	4
Subtotal		***27***	***28***	***23***	***18***	***25***	***22***	***21***	***17***	***22***	***18***
Scale and Market Potential	**Production Value**:	**9**	**8**	**8**	**9**	**7**	**6**	**7**	**6**	**6**	**5**
	Market Demand	9	7	8	8	7	6	7	6	7	5
	Export Potential:	6	9	5	4	8	5	6	4	5	6
	Growth Potential:	8	7	7	8	7	6	7	6	6	5
	Cost Competitiveness:	7	6	8	9	6	5	7	6	6	5
	Market Expansion Potential:	8	7	7	8	7	6	7	5	6	5
Subtotal		***38***	***36***	***35***	***37***	***35***	***28***	***34***	***27***	***30***	***26***
Socio-Economic Impact	**Employment Generation**:	9	8	8	9	7	6	7	6	7	5
	Households Benefitting:	9	7	8	9	7	6	7	6	7	5
	Inclusivity & Equity:	8	6	7	8	6	6	7	6	7	5
	Accessibility for the Poor:	8	5	7	8	6	5	7	6	7	5
Subtotal		***34***	***26***	***30***	***34***	***26***	***23***	***28***	***24***	***28***	***20***
Food Security Contribution	**Food Availability & Access**:	9	3	8	9	5	6	7	6	7	4
	Price Stability & Affordability:	8	4	7	8	5	6	7	6	6	4
	Nutrition & Health Impact:	8	3	7	8	5	6	7	6	7	5
Subtotal		***25***	***10***	***22***	***25***	***15***	***18***	***21***	***18***	***20***	***13***
Other Considerations	**Policy & Institutional Support:**	8	7	7	8	6	6	7	6	7	5
	Environmental Sustainability:	6	7	6	7	5	6	6	6	6	5
	Cultural Importance:	9	6	8	8	6	5	7	6	7	5
Subtotal		***23***	***20***	***21***	***23***	***17***	***17***	***20***	***18***	***20***	***15***
TOTAL SCORE		**147**	**120**	**131**	**137**	**118**	**108**	**124**	**104**	**120**	**92**
RANK		**2**	**6**	**4**	**3**	**8**	**9**	**5**	**10**	**6**	**11**

ABOUT THE AUTHOR

Yeshua Russel is an independent consultant based in Nigeria. He holds a MS in Business Administration from Ambrose Alli University.

REFERENCES

2SCALE, nd. Soybean PO Nigeria. Retrieved on May 3rd 2025. https://www.2scale.org/en/past-partnerships/soybeans-po-nigeria-en

Abanigbe, S. A., Ngidi, M. S., Ojo, T. O., Orowole, P., Yusuf-Oshoala, M. A., Adebayo, B., and Olutola, A., 2024. Challenges and Coping Strategies of Smallholder Poultry Farmers in South-West, Nigeria. The African Science Frontiers Initiatives (ASFI) Research Journal. 2025;2(1): e14447. https://asfirj.org/useruploads/manuscripts/1736761993_Abanigbe%20et%20al%20(ASFIRJ-2024-000012T)%20-%20FINAL.pdf

Adam, A. and Bidoli, T., 2018. Assessment of Gender Involvement in Rice Processing under Staple Crop Processing of Agricultural Transformation Agenda Support Program -1 (ATASP-1) In Kebbi State. National Agricultural Extension and Research Liaison Services/ Ahmadu Bello University (NAERLS/ABU), Zaria. Journal of Agriculture and Environment Vol. 14 No. 2, 2018: 55-62. ISSN 1595-465. https://www.ajol.info/index.php/jagrenv/article/download/235730/222705

Adam, A. G., Bidoli, T. D., Ammani, A. A. & Oduehie, T. C., 2018. Gender Participation in Rice Processing Value Chain in Kebbi and Sokoto States, Nigeria. Global Journal of Science Frontier Research: D, Agriculture and Veterinary, Volume 18 Issue 2 Version 1.0 Year 2018. Global Journals. Online ISSN: 2249-4626 & Print ISSN: 0975-5896. https://tinyurl.com/5cs4hxpc

Adebayo, A., Ayodeji, K., Akeem, T., Adeolu, A., Oluwafunmilola, A., Victoria, T., Ayodeji, O. and Temitope, O., 2023. Impact of membership in agricultural cooperatives on yield of smallholder tomato farmers in Nigeria. Published by Elsevier Inc. Environmental and Sustainability Indicators 20 (2023) 100313. https://doi.org/10.1016/j.indic.2023.100313

Adegoke, T. D., Ojiagu, C. N. & Ariyo, C. O., 2023. Influence of Agricultural Cooperative in Promoting Food Security in Ekiti State, Nigeria. International Journal of Research and Innovation in Social Science (IJRISS). ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue VIII August 2023. https://dx.doi.org/10.47772/IJRISS.2023.7903

Adeleye, Y., 2024. NIGERIA-EU support to strengthening private sector adaptation to EU deforestation regulation and Corporate sustainability Due diligence directive (CS3D). Volume 1: Mapping of actors in cattle, cocoa, rubber, and timber value chains. TPSDE Facility. https://www.eeas.europa.eu/sites/default/files/documents/2024/Volume%201%20Nigeria.%20Mapping%20of%20value%20chains%20%20v02%20rev16.09.24%20%281%29_0.pdf

Adesiyan, T. F., Yesufu, O. A. and Kehinde, A. D., 2023. Impact of certification on market performance of cocoa industry in Osun State, Nigeria. Social Sciences & Humanities Open. 8 (2023) 100692. Elsevier Ltd. https://www.researchgate.net/profile/Taiwo-Adesiyan-2/publication/388615545_Impact_of_certification_on_market_performance_of_cocoa_industry_in_OSUN_State_Nigeria/links/

Adexen. Nd. Shonga Farms Nigeria Limited Report. Retrieved on April 17th 2025. https://www.adexen.com/company/253105?utm

Adewuyi, S. A., Tolorunju, E. T., Olusanya, I. O., and Akinbode, S. O., 2024. Determinants and Constraints of Access to Credit by Poultry Egg Farmers in Ogun State Nigeria. Asian Journal of Agricultural Extension, Economics & Sociology. : 2024 - Volume 42 [Issue 11]. https://journalajaees.com/index.php/AJAEES/article

Adeyonu, A. G., Okunola, A., Alao, M. O., Oyawoye, E. O. and Okonkwo, C. O. 2020. An assessment of broiler value chain in Nigeria. De Gruyter Bill. Open Agriculture 2021; 6: 296–307. https://www.degruyterbrill.com/document/doi/10.1515/opag-2020-0168/pdf?licenseType=open-access

Adeyonu, A., Ajiboye, B,. Isitor, S. and Faseyi, S. 2017. An analysis of the factors influencing access to credit by poultry farmers in Abuja, Nigeria. Agriculturae Conspectus Scientificus . Vol. 82 (2017) No. 1 (55-62). https://eprints.lmu.edu.ng/1079/1/acs82_09-1.pdf

Adinya I. B., Ogbonna K. I., Umoh E. E. and Idio A. D. 2013. Effect of awareness creation on gender access, utilization and repayment of loans by broiler farmers in Cross River State, Nigeria. Net Journal of Agricultural Science. Vol. 1(3), pp. 93-99, September 2013. ISSN: 2315-9766. https://www.netjournals.org/pdf/NJAS/2013/3/13-034.pdf

Adikwu, O., Musa, A. U. and Hosea, E. F., 2024. Factors Influencing Marketing of Tomatoes in Jalingo Local Government Area of Taraba State, a Case Study of CBN Redesign of Naira Notes. Nigerian Journal of Agriculture and Agricultural Technology (NJAAT) Volume 4, Number 1, March, 2024

ISSN (Print): 2811-1885; ISSN (Online): 2811-1893. https://www.researchgate.net/profile/Okoh-Adikwu/publication/379925066

Advanced Financial Network (ADVFN), 2023. Nigeria Soybean Production Forecast to Fall 8% in 2023-24. Dow Jones News. Retrieved on May 3rd 2025. https://www.advfn.com/stock-market/stock-news/90897453/nigeria-soybean-production-forecast-to-fall-8-in

African Agricultural Technology Foundation (AATF), 2024. New Study Reveals Gender Dynamics in Maize Production in Northern Nigeria. Retrieved April 29th 2025. https://www.aatf-africa.org/new-study-reveals-gender-dynamics-in-maize-production-in-northern-nigeria

African Development Bank (AfDB), 2025. Nigeria's Agro-Revolution: Construction of Special Agro-industrial Processing Zones (SAPZ) begins. Retrieved June 6th 2025. https://www.afdb.org/en/news-and-events/press-releases/nigerias-agro-revolution-construction-special-agro-industrial-processing-zones-sapz-begins-82556

African Health Report, 2024. Nigeria’s Maize Imports Decline to $1.1m in 2023 Amid Push for Self-Sufficiency. Retrieved April 23rd 2024. https://africanhealthreport.com/2024/12/13/nigerias-maize-imports-decline-to-1-1m-in-2023-amid-push-for-self-sufficiency/

Agada, M. O., Onuche, F. I. and & Mbah, E. N., 2018. Gender Participation and Constraints in Cassava Production, Processing and Marketing in Makurdi, Benue State, Nigeria. International Journal of Gender and Women’s Studies, Vol. 6, No. 1, pp. 79-87. ISSN: 2333-6021 (Print), 2333-603X (Online). https://ijgws.thebrpi.org/journals/ijgws/Vol_6_No_1_June_2018/7.pdf

Agbongiarhuoyi, A. E., Thomas, K. A., Uwagboe, E. O., and Famuyiwa, B. S., 2020. Utilization of ICTs In Accessing Cocoa Beans Market Information by Cross River State Farmers. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 20, Issue 3, 2020

PRINT ISSN 2284-7995, E-ISSN 2285-3952. https://d1wqtxts1xzle7.cloudfront.net/79806453/Art4-libre.pdf

Agricultural Business, 2024. How Long Does It Take Tomatoes to Mature In Nigeria? Retrieved on April 25th 2025. https://agricbusiness.com.ng/how-long-does-it-take-tomatoes-to-mature-in-nigeria/

AgroNigeria, 2024. The Role of Farmers' Cooperatives in Supporting Food Security Efforts. Retrieved on may 26th 2025. https://agronigeria.ng/the-role-of-farmers-cooperatives-in-supporting-food-security-efforts/

Agwu, A.E., Suvedi, M., Chanza, C., Davis, K., Oywaya- Nkurumwa, A., Najjingo Mangheni, M., and Sasidhar, P.V.K. (2023). Agricultural Extension and Advisory Services in Nigeria, Malawi, South Africa, Uganda, and Kenya. Partnerships for Innovative Research in Africa (PIRA) Research Report. East Lansing, Michigan, USA: Alliance for African Partnership, Michigan State University. https://aap.isp.msu.edu/files/2116/8383/7679/2._Agricultural_Extension_and_Advisory_Services_in_Sub-Saharan_Africa.pdf

Ajetomobi, J. O., 2015. Market Power in Nigerian Domestic Cocoa Supply Chain. AERC Research Paper 294 African Economic Research Consortium, Nairobi. March 2015. ISBN 978-9966-023-82-7. https://publication.aercafricalibrary.org/server/api/core/bitstreams/51a1b152-d4e0-471a-9ada-cc298624d58d/content

Ajibade, Y. E., Oyibo, F. O., Ameh, O. E. and Enimola, M. O., 2021. Analysis of gender roles in tomato production in Municipal Area Council, Abuja, Nigeria. Journal of Agricultural Science and Practice. Volume 6(1), pages 1-12, February 2021. Article Number: CD9179F61 ISSN: 2536-7072. https://www.researchgate.net/profile/Yetunde-Ajibade/publication/349771346

Akanbi, S. O, Alarape, W. I, and Olatunji, O. S., 2019. Economic Implication of Contract Farming on Small-Scale Rice Farmers in Kwara State, Nigeria. Agrosearch, 19(2): 26-40 (2019). https://www.ajol.info/index.php/agrosh/article/download/197778/186535

Akaninyene, P. O., Obiekwe, N., Anunobi, C., Obot, E. and Udoh, M., 2023. Constraints to Rural Women Involvement in Cassava Value Chain in Nigeria. American Journal of Economics and Business Administration. https://thescipub.com/pdf/ajebasp.2023.13.17.pdf

Akinola, A., Kehinde, A., Tijani, A., Ayanwale, A., Adesiyan, F., Victoria Tanimonure, V., Ogunleye, A. and Ojo, T., 2023. Impact of membership in agricultural cooperatives on yield of smallholder tomato farmers in Nigeria. Environmental and Sustainability Indicators 20 (2023) 100313. https://www.researchgate.net/profile/Ayodeji-Kehinde/publication/375756500

Akinola, G. O. 2005. Gender factor in the structure and conduct of the cocoa industry in Nigeria. South African Journal of Business Management. 2005, 36 (1). https://www.researchgate.net/publication/334369615_Gender_factor_in_the_structure_and_conduct_of_the_cocoa_industry_in_Nigeria/

Akintayo, A. A, Omoyele, O. S., and Babatunde, B. O., 2024. Value Chain Development Programs and

Small Scale Rice Producers in Nigeria. BERJAYA Journal of Services & Management. e-ISSN 2716-5949

Vol.22, July 2024, 92 -104. https://www.researchgate.net/profile/Akintunde-Akintayo-2/publication/383126357_VALUE_CHAIN_DEVELOPMENT_PROGRAMS_AND_SMALL_SCALE_RICE_PRODUCERS_IN_NIGERIA/

Akinwale, J. A., Oluwole, B. O. & Wole-Alo, F. I., 2023. Digital Platforms for Linking Agriculture Investors with Smallholder Farmers in Nigeria. Journal of Agricultural Extension. Vol. 27 (2) 65-72. ISSN(e): 24086851; ISSN(Print): 1119944X. https://dx.doi.org/10.4314/jae.v27i2.6

Akpan, S. B., & Nkanta, V. S., 2022. Trend analysis and macroeconomic variable determinants of egg production in Nigeria. Journal of Agricultural Production, 3(2), 100-109. https://doi.org/10.56430/japro.1174674

Alabi, D., Alao, O., and Olagunju, I., 2023. Rural Households' Youth Participation in Rice Agribusiness Value Chain Activities: Implications for Employment Opportunities. The Journal of Agricultural Sciences - Sri Lanka. https://www.researchgate.net/publication/377487271_Rural_Households'_Youth_Participation_in_Rice_Agribusiness_Value_Chain_Activities_Implications_for_Employment_Opportunities

Alabi, O. O., Lawal, A. F., and Oladele, A. O, 2016. Assessment of an Electronic Wallet System and

Determinants of Cassava Farmers' Participation in Off-farm Activities in Abuja, Nigeria. Journal of Agricultural Sciences Vol. 61, No. 4, 2016, Pages 399-410.1450-8109 (Print). 2406-0968 (Online). https://doiserbia.nb.rs/img/doi/1450-8109/2016/1450-81091604399A.pdf

Alabi, R. A. and Adams, O. O., 2020. The Impact of E-Wallet Fertilizer Subsidy Scheme and its Implication on Food Security in Nigeria. AERC Research Paper 390. African Economic Research Consortium, Nairobi. ISBN 978-9966-61-083-6. https://aercafrica.org/wp-content/uploads/2020/01/Research-Paper-390.pdf

Ameh, M. and Lee, S. H., 2022. Determinants of Loan Acquisition and Utilization among Smallholder Rice Producers in Lagos State, Nigeria. MDPI. Sustainability 2022, 14, 3900. https://doi.org/10.3390/su14073900

Anthony, L., Alabi, O. O., Ebukiba, E. S. and V. Gamba. 2021. Factors influencing output of rice produced and choice of marketing outlets among smallholder farming households, Abuja, Nigeria. Sarhad Journal of Agriculture, 37(1): 262-277. http://dx.doi.org/10.17582/journal.sja/2021/37.1.262.277

Apata, D. F and Yusuf, O, J., 2022. Roles Of Cooperatives in Enhancing Agricultural Production, Productivity and Livelihood of Farmers in Nigeria: A Review. Nigerian Journal of Agricultural Extension, Vol. 21, Number 2, June 2020. https://www.researchgate.net/publication/361910368

Associated Press, 2023. Takeaways on AP's investigation into cocoa coming from a protected Nigerian rainforest. Retrieved on May 28th 2025. https://apnews.com/article/chocolate-deforestation-cocoa-farming-nigeria-08b396be56cc65d08c950f61308539d3

Ayoola, J., La'ah, D. and Weye, E., 2022. Assessment of the Price Fluctuation on Production of Selected Food Grains in Nigeria (1981-2020) Journal of Agripreneurship and Sustainable Development (JASD) Volume 5, Number 2, 2022. ISSN (Print): 2651-6144; ISSN (Online): 2651-6365. https://www.researchgate.net/publication/370119498_assessment_of_the_price_fluctuation_on_production_of_selected_food_grains_in_nigeria_1981-2020

Ayosifam, nd. Who we are. Retrieved on May 28th 2025. https://ayosifamhub.com.ng/about-us/

Badmus, A. I., Oyelere, G. O., Aremu, A. O., Orija, S. J. and Atigbi, T. O., 2015. Women Farmers' Contributions to Maize Production in Afijio Local Government of Oyo State. International Journal of Applied Agricultural and Apicultural Research (IJAAAR), 11(1&2): 77–85. https://www.ajol.info/index.php/ijaaar/article/download/141578/131321

Biometric Update, 2023. Nigerian banks, Agric program to require digital ID from customers, beneficiaries. Retrieved on June 4th 2025. https://www.biometricupdate.com/202312/nigerian-banks-agric-program-to-require-digital-id-from-customers-beneficiaries

Bello, A. A., 2024. Boko Haram Insurgency and Maize Production in Northeastern Nigeria, 2008-2023. Iconic Research and Engineering Journals. Volume 8 Issue 5. ISSN: 2456-8880. https://www.irejournals.com/formatedpaper/1706584.pdf

Bello, T. O., Oguntade, A. E. and Afolayan, T. T., 2025. Profitability and Efficiency of Cassava Production in Ekiti State, Nigeria. Agriculture Archives. ISSN: 3041-5322. https://agriculture.researchfloor.org/wp-content/uploads/2025/01/Profitability-and-Efficiency-of-Cassava-Production-in-Ekiti-State-Nigeria.pdf

Blueprint Newspaper, 2024. Commodity associations and food crisis in Nigeria. Retrieved on May 25th 2025. https://blueprint.ng/commodity-associations-and-food-crisis-in-nigeria/

BusinessDay, 2020. Banking agents' commissions make up 55% of customer charges. Retrieved April 25th 2025. https://businessday.ng/exclusives/article/banking-agents-commissions-make-up-55-of-customer-charges/

BusinessDay, 2025. Local cassava production falls short of industries' demand. Retrieved on June 2nd 2025. https://businessday.ng/agriculture/article/local-cassava-production-falls-short-of-industries-demand/

CEIC Data, 2024. Nigeria Commodity Price: Soyabeans. Retrieved on May 1st 2025. https://www.ceicdata.com/en/nigeria/commodity-prices/commodity-price-soyabeans

Central Bank of Nigeria (CBN), 2020. Analysis of the Impact of Central Bank of Nigeria's Agricultural Intervention Funds on the Economy. Economic and Financial Review Document. https://www.cbn.gov.ng/Out/2020/RSD/EFR%20Volume%2058%20Number%201%20Analysis%20of%20the%20Impact%20of%20Central%20Bank%20of%20Nigeria's%20Agricultural%20Intervention%20Funds%20on%20the%20Economy.pdf

Central Bank of Nigeria (CBN), 2022. Digital Financial Services and Financial Inclusion in Nigeria: Milestones and New Directions. Economic and Financial Review. Volume 60/4 December 2022. https://www.cbn.gov.ng/Out/2024/RSD/Digital%20Financial%20Services%20and%20Financial%20Inclusion%20in%20Nigeia,%20Milestones%20and%20New%20Direction.pdf

Central Bank of Nigeria (CBN), 2024. Letter to all Financial Consumer Protection Stakeholders: CBN Licensed/Supervised Institutions, Consumers of Financial Products and Services. https://www.cbn.gov.ng/Out/2024/CCD/EXPOSURE%20DRAFT%20REVISED%20CONSUMER%20PROTECTION%20REGULATIONS%202.0.pdf

Central Bank of Nigeria (CBN), nd. Agriculture, retrieved on May 29th 2025. https://www.cbn.gov.ng/DFD/agriculture.html

Central Bank of Nigeria (CBN), nd. Financial Inclusion. Retrieved on May 28th 2025. https://www.cbn.gov.ng/fininc/

Central Bank of Nigeria (CBN), nd. CDI: Poultry. Retrieved on April 27th 2025. https://www.cbn.gov.ng/dfd/agriculture/CDI/poultry

Centre for the Promotion of Imports from Developing Countries (CBI), 2024. 9 tips on how to go digital in the cocoa sector. Netherlands Ministry of Foreign Affairs. Retrieved on May 1st 2025. https://www.cbi.eu/market-information/cocoa-cocoa-products/tips-go-digital

Centre for the Promotion of Imports from developing countries (CBI), 2021. Food Loss in Nigeria Value Chain Analysis (VCA) of Tomato, Onion, Chilli Value Chains. Ministry of Foreign Affairs, Netherlands. https://www.cbi.eu/sites/default/files/market_information/researches/VCA%20Food%20Loss%20in%20Nigeria%202020.pdf

Chiaka, J. C., Zhen, L., Yunfeng, H., Xiao, Y., Muhirwa, F., and Lang, T., 2022. Smallholder Farmers Contribution to Food Production in Nigeria. Frontiers in Nutrition, Volume 9 | Article 916678. https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2022.916678/pdf

Chinelo, U. V., and Ayodeji, E. P., 2023. Leveraging on digital technology for financial inclusion of women agripreneurs in Southern Nigeria. F1000Research 2023, 11:704. https://www.researchgate.net/publication/376426404

Chukwulobelu, S. A., Enwelu, A. I. and Obianefo, C. A. 2024. Effect of Financial Inclusion on Market Participation of Rice Farmer's Cooperative Members in Anambra State. International Journal of Life Science Research Archive, 2024, 06(01), 096–107. ISSN: 0799-6640 (Online). https://doi.org/10.53771/ijlsra.2024.6.1.003

Cicada, 2024. Nigeria's Digital Economy: The Rise of PoS and Lessons for Crypto. Retrieved on April 20th, 2025. https://www.cicada-mm.com/post/pos-transactions-transforming-nigerias-digital-economy

Cocoa Farmers Association of Nigeria (CFAN), nd. About us. Retrieved on June 1st 2025. https://www.cfancocoa.org/aboutacademy.php

Cocoa Association of Nigeria (CAN), nd. About us. Retrieved on May 29th 2025. https://cocoaassociationofnigeria.com/about/

Commonwealth Scientific and Industrial Research Organisation (CSIRO), 2020. Poultry Production in Nigeria. Supporting Evidence-Based Interventions to Achieve Agricultural Development Goals [SEBI] LiveGAPS 2). https://research.csiro.au/livegaps/wp-content/uploads/sites/37/2021/03/1.-LiveGAPS-factsheet-Poultry-production-in-Nigeria-22-April-2020.pdf

Coulibaly, O., Arinloye A. D., Faye M. D. and Abdoulaye, T., 2014. Regional Cassava Value Chains

Analysis in West Africa: Case study of Nigeria. Working Paper. September 2014. International Institute of Tropical Agriculture (IITA). West and Central African Council for Agricultural Research and Development (CORAF/WECARD), Dakar, Senegal. https://www.researchgate.net/profile/Djalalou-Dine-Aa-Arinloye/publication/269988234_REGIONAL_CASSAVA_VALUE_CHAINS_ANALYSIS_IN_WEST_AFRICA_CASE_STUDY_OF_NIGERIA/

Daily Trust Newspapers, 2019. 200,000 Soybeans farmers for 2019 anchor borrowers' scheme. Retrieved on June 3rd 2025. https://dailytrust.com/200000-soybeans-farmers-for-2019-anchor-borrowers-scheme/#google_vignette

Darben Africa, 2024. The Agricultural Value Chain, Challenges and Digital Opportunities in Nigeria. Retrieved on May 5th 2025. https://dardenafrica.com/blog/agricultural-value-chain-challenges-and-digital-opportunities-in-nigeria

Data Bridge Market Research, 2022. Nigeria Cassava Starch Market – Industry Trends and Forecast to 2030. Retrieved on April 30th 2025. https://www.databridgemarketresearch.com/reports/nigeria-cassava-starch-market

Dauda, C., Yakubu. A., Sambo, I., Okworie, E., Adeosun, J., and Onyibe, J., 2014. Rice Production, Processing, Utilization and Marketing in Nigeria WAAPP / National Agricultural Extension and Research Liaison Services (NAERLS). https://naerls.gov.ng/wp-content/uploads/2022/11/Rice-Production-Processing-Utilization-and-Marketing-in-Nigeria.pdf

Deji, O. F., 2017. Nigeria smallholder women poultry farmers reaping the benefits of ACGG project: Evidence from CIPs. ACGG Gender Validation Strategy Workshop, ILRI, Addis Ababa, 21-22 September 2017. https://gatesopenresearch.org/documents/3-1412/pdf#:~:text=76.50,23.50

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), nd. Soybeans Value Chain. Sustainable and Inclusive Economic Development for Decent Employment in Nigeria (SEDIN). https://sedin-nigeria.net/wp-content/uploads/Soy-Processing-Value-Chain.pdf

Donkor, E., Onakuse, S. and Bogue, J., 2022. Income inequality and distribution patterns in the cassava value chain in the Oyo State, Nigeria: a gender perspective. British Food Journal, Vol. 124 No. 13, 2022. pp. 254-273. Emerald Publishing Limited. 0007-070X. https://www.emerald.com/insight/content/doi/10.1108/bfj-06-2021-0663/full/pdf

Dosumu, O., 2024. Overcoming infrastructural barriers to digital literacy in rural Nigeria. Social Science Research Network (SSRN). https://download.ssrn.com/2024/10/18/4992050.pdf

EFInA/A2F, 2024. Digital service adoption lifts Nigeria's financial inclusion to 64% - Survey. Retrieved on May 2nd 2025. https://a2f.ng/digital-service-adoption-lifts-nigerias-financial-inclusion-to-64-survey/

Egyir, I. S., Lartey, A., Amissah, N. And Asem, F. E., 2022. Report on the Horticulture Sector in West Africa. USAID, University of Ghana. Horticulture Innovation Lab. University of California. https://horticulture.ucdavis.edu/sites/g/files/dgvnsk1816/files/extension_material_files/THE%20HORTICULTURE%20SECTOR%20IN%20WEST%20AFRICA%20final%20report%20updated.pdf?

Ejechi, M. E., Eluagu, C. J., Oji, L. C., Okoye, B. C. and Madu, T. U., 2024. Contributions and Challenges of Rural Youth within the Cassava Value Chain in Ebonyi State, Nigeria. Nigerian Agricultural Journal, Volume 55 Number 2, August 2024, Pg.649-658. ISSN: 0300-368X. https://www.ajol.info/index.php/naj/article/download/294743/277358

Elum, Z. A. and Obiajunwa, U. 2022. Analysis of institutional credit accessibility among small-holder poultry farmers in Rivers State, Nigeria. Journal of Development and Agricultural Economics. Vol. 14(2), pp. 30-40, April-June 2022. DOI: 10.5897/JDAE2022.1329. Article Number: DCBEF3E68946. ISSN 2006-9774. https://www.researchgate.net/publication/360286534

Enhancing Financial Innovation & Access (EFInA), 2018. Key Findings: EFInA Access to Financial Services in Nigeria 2018 Survey. https://www.efina.org.ng/wp-content/uploads/2019/01/A2F-2018-Key-Findings-11_01_19.pdf

Enhancing Financial Innovation & Access (EFInA), 2023. A2F 2023 Survey - Key Highlights. Unlocking insights to accelerate financial and economic inclusion. https://efina.org.ng/wp-content/uploads/2024/03/A2F-2023-Event-Day-Presentation-Version4-1.pdf

Enhancing Financial Innovation & Access (EFInA), 2025. High Cost of Financial Services: A barrier to formal financial inclusion in Nigeria. https://www.efina.org.ng/wp-content/uploads/2024/05/High-Cost-of-Financial-services.pdf

Eniola, S., 2024. Nigerian Rice Industry: The Journey So Far. Vestance. Retrieved March 24th 2025 from. https://vestanceng.com/blog/analysing-the-nigerian-rice-industry

ESSFeed, 2025. The top 10 tomato producing states in Nigeria. Retrieved on April 29th 2025. https://essfeed.com/the-top-10-tomato-producing-states-in-nigeria-the-top-10-tomato-producing-states-in-nigeria/

Faloni, K. B., Tijani, A. A. and Kehinde, A. D., 2022. Economic Impact of Cocoa Farmers' Compliance to EU Pesticide Regulations in Osun State, Nigeria. Agriculturae Conspectus Scientificus. Vol. 87 (2022) No. 2 (165-180). https://www.researchgate.net/profile/Ayodeji-Kehinde/publication/361425989_Economic_Impact_of_Cocoa_Farmers%27_Compliance_to_EU_Pesticide_Regulations_in_Osun_State_Nigeria/links/62b0d553d49f803365ab9a0b/Economic-Impact-of-Cocoa-Farmers-Compliance-to-EU-Pesticide-Regulations-in-Osun-State-Nigeria.pdf

Farming Farmers Farm, 2024. Empowering tomato farmers through cooperatives. Retrieved April 27th 2025. https://farmingfarmers-farms.com/2024/02/empowering-tomato-farmers-through-cooperatives/

Fasakin, O. A., Ajayi, O. E. and Olajide, O. A., 2023. Gender disparity in cocoa production resource access and food security in Ogun state, Nigeria. African Journal of Food Agriculture Nutrition and Development. Afr. J. Food Agric. Nutr. Dev. 2023; 23(9): 24560-24583. https://www.ajfand.net/Volume23/No9/Fasakin22350.pdf

Fashogbon, A., Morrison, L., Sahay, A., Vaillant, J. and Johansen, Z., 2023. Gender Gaps in Agriculture Productivity and Public Spending in Nigeria. World Bank. Gender Innovation Lab 2023. https://documents1.worldbank.org/curated/en/099091823113036874/pdf/P175095086510b001080e30d147463456d6.pdf?utm_source=chatgpt.com

Federal Ministry of Agriculture and Rural Development (FMARD), 2020. National Rice Development Strategy II, 2020 – 2030. https://riceforafrica.net/wp-content/uploads/2022/02/nigeria_nrds2.pdf

Feed the Future. https://www.iita.org/wp-content/uploads/2020/07/Guide-to-Rice-Production-in-Northern-Nigeria.pdf?utm_source=chatgpt.com

Fintech Magazine Africa, 2024. USSD Transactions in Nigeria Hit N2.19tn in First Half of 2024 Amidst Debt Challenges. Retrieved on May 2nd 2025. https://fintechmagazine.africa/2024/12/09/ussd-transactions-in-nigeria-hit-n2-19tn-in-first-half-of-2024-amidst-debt-challenges/

Fintech Magazine Africa, 2025. Nigeria's Mobile Money Transactions Surge to N71.5 Trillion in 2024 Despite Regulatory Hurdles. Retrieved April 30th 2025. https://fintechmagazine.africa/2025/02/03/nigerias-mobile-money-transactions-surge-to-n71-5-trillion-in-2024-despite-regulatory-hurdles/

Food and Agriculture Organization of the United Nations (FAO), 2025. GIEWS - Global Information and Early Warning System. Nigeria Country Brief – Maize. Retrieved April 30th 2025. https://www.fao.org/giews/countrybrief/country.jsp?code=NGA

Food and Agriculture Organization of the United Nations (FAO), 2024, Hand in Hand Investment Forum 2024, Nigeria Investment Proposal. https://storage.googleapis.com/hih-resources/Nigeria/Nigeria1.pdf

Food and Agriculture Organization of the United Nations (FAO), 2025. FAO and Kaduna State Government Partner to Transform Tomato Value Chain. News Report. Retrieved on April 28th 2025. https://www.fao.org/nigeria/news/detail-events/en/c/1733325/

Food and Agriculture Organization of the United Nations. (n.d.). Rice production in Nigeria. Retrieved March 24, 2025, from https://www.fao.org/4/Y4347E/y4347e1c.htm

Food and Agriculture Organization of the United Nations. 2020. USAID. Africa Sustainable Livestock. Nigeria cattle and poultry sectors. CA2149EN/1/10.18. https://openknowledge.fao.org/server/api/core/bitstreams/4911d95b-6154-42e6-aa74-e6119d55f26e/content

Food and Beverage Outlook, 2025. Premier Feed Mills: Overcoming Agricultural Adversity. Retrieved April 30th 2025. https://www.foodbeverage-outlook.com/agriculture-farming/premier-feed-mills-overcoming-agricultural-adversity

Food and Beverage Outlook, 2025. Premium Edible Oil Products Ltd : Feeding the Nation, Every Day. Retrieved on May 26th 2025. https://www.foodbeverage-outlook.com/food-manufacturing/premium-edible-oil-products-ltd-feeding-the-nation-every-day

Francis, O. O., Daniel, A. and Oladapo, O. I., 2022. Access to Credit and Rice Production Efficiency of Rural Households in Benue State, Nigeria. Nigerian Journal of Agriculture and Agricultural Technology (NJAAT). Volume 2, Number 1, June, 2022. ISSN (Print): 2811-1885; ISSN (Online): 2811-1893. https://www.researchgate.net/publication/361585406

Future Agricultures, 2020. Gender inequalities in Nigerian cocoa production. Retrieved on May 1st 2025. https://www.future-agricultures.org/blog/gender-inequalities-in-nigerian-cocoa-production/

Future Agricultures, 2023. Do women cocoa farmers in Nigeria face gender disparities in resource access, decision-making and food security? Retrieved on May 3rd 2025. https://www.future-agricultures.org/apra/do-women-cocoa-farmers-in-nigeria-face-gender-disparities-in-resource-access-decision-making-and-food-security/

Global Agricultural Information Network. Nigeria: Grain and Agricultural Report Report No: NI2025-0003. March 19, 2025.https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain%20and%20Feed%20Annual_Lagos_Nigeria_NI2025-0003.pdf

GlobalData, 2022. Nigeria Dairy and Soy Food Market Size and Trend Analysis by Categories and Segment, Distribution Channel, Packaging Formats, Market Share, Demographics and Forecast, 2021-2026. Retrieved on June 4th 2025. https://www.globaldata.com/store/report/nigeria-dairy-and-soy-food-market-analysis/

GSMA, 2020. Analysis - Digitising payments in agricultural value chains: The revenue opportunity to 2025. GSMA AgriTech Programme. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/wp-content/uploads/2020/01/Digitising-payments-in-agricultural-value-chains-the-revenue-opportunity-to-2025.pdf

GSMA, 2024. The role of mobile technology in driving the digital economy in Nigeria. A partnership between mobile service providers and government to support Nigeria's future growth and prosperity. https://www.gsma.com/about-us/regions/sub-saharan-africa/wp-content/uploads/2024/05/NigeriaDigitalEconomy_R3_Web.pdf

GSMA, 2024. The State of the Industry Report on Mobile Money 2024. Bill and Melinda Gates Foundation. https://www.gsma.com/sotir/wp-content/uploads/2024/03/GSMA-SOTIR-2024_Report.pdf

GSMA, 2025. The State of the Industry Report on Mobile Money 2025. based on data collected from the Global Adoption Survey 2024 and the 2024 GSMA Consumer Survey. https://www.gsma.com/sotir/wp-content/uploads/2025/04/The-State-of-the-Industry-Report-2025_English.pdf

Guobadia, E. E. (2021). The effect of seasonal variation on performance of egg type poultry: A case study of Mitchell Farms, Mosogar, Delta State, Nigeria. Nigerian Journal of Animal Production, 24(2), 101–105. https://doi.org/10.51791/njap.v24i2.2306

Gyimah-Brempong, K., Johnson, M. and Takeshima, H., 2016. The Nigerian Rice Economy: Policy Options for Transforming Production, Marketing, and Trade. In The Nigerian rice economy: Policy options for transforming production, marketing, and trade. Chapter 2. Pp. 21-50. Washington, D.C.: International Food Policy Research Institute (IFPRI). https://cgspace.cgiar.org/server/api/core/bitstreams/be54c6ee-58a8-48e2-be1d-a23a7daadbc7/content

HarvestPlus, 2023. Championing Sustainable Storage Practices for Healthier Crops in Northern Nigeria. Retrieved on June 3rd 2023. https://www.harvestplus.org/championing-sustainable-storage-practices-for-healthier-crops-in-northern-nigeria/

Headlines, 2025. Fintechs outpace telcos in mobile money race. Retrieved on April 2nd 2025. https://headlines.ng/fintechs-outpace-telcos-in-mobile-money-race/

Helgilibrary i, nd. Chicken Meat Production in Nigeria. Source FAOstat. Retrieved on April 25th 2025. https://www.helgilibrary.com/indicators/chicken-meat-production/nigeria/

Helgilibrary ii, nd. Total Egg Production in Nigeria. Retrieved on April 25th 2025. https://www.helgilibrary.com/indicators/total-egg-production/nigeria/

Hussaini, A. S., Oladimeji, Y. U., Hassan, A. A. and Sani, A. A., 2021. Empirical Review of Rice Farmers' Investment in Value Addition In Kebbi State, Nigeria. Journal of Agripreneurship and Sustainable Development (JASD). Volume 4, Number 2, June, 2021. ISSN (Print): 2651-6144; ISSN (Online): 2651-6365. https://www.researchgate.net/publication/352994580_empirical_review_of_rice_farmers'_investment_in_value_addition_inkebbi_state_nigeria

Idu, E. E., Sennuga, S. O. and Owoicho, A., 2025. Assessment of the Socioeconomic Factors Affecting Smallholder Rice Farmers' use of ICTS to access Market information in Nasarawa State, Nigeria Research Journal of Agriculture and Food Science. Vol. 13(1), Pp. 64-71. ISSN: 2354-4147. https://journals.directresearchpublisher.org/index.php/drjafs/article/download/RiceFarmers/Socioeconomic/524

Ikenga, V. U., Oyita, G. E., & Gbigbi, T. M. (2024). Prospects and challenges of agricultural financing in Nigeria: A review. GSC Advanced Research and Reviews, 18(03), 388–399. https://gsconlinepress.com/journals/gscarr/sites/default/files/GSCARR-2024-0116.pdf

Industrial Cassava Stakeholder Association of Nigeria (ICSAN), nd. About us. Retrieved on June 3rd 2025. https://www.icsan.com.ng/about/

Ingweye, J. N. and Meinderts, J. 2021. Seasonality of egg demand, production, and supply in Greater Port Harcourt City, Nigeria. Black Sea Journal of Agriculture. Research Article Volume 4 - Issue 1: 1-7 / January 2021. e-ISSN: 2618 – 6578. https://www.researchgate.net/publication/348277180_Seasonality_of_Egg_Demand_Production_and_Supply_in_Greater_Port_Harcourt_City_Nigeria

International Cocoa Organization (ICCO), 2023. Feasibility study on Africa Cocoa Exchange (AFCX). Appendix iii. Value chain and sectoral regulatory analysis country reports Nigeria country report Darhei Noam Ltd. https://www.icco.org/wp-content/uploads/4-FEASIBILITY-STUDY-ON-AFRICA-COCOA-EXCHANGE__Annex_NIGERIA.pdf

International Food Policy Research Institute (IFPRI), 2023. Bundling cash loans with agricultural input

loans for farmers in Nigeria: A Pilot Study. A Project Note. CGIAR. https://cgspace.cgiar.org/server/api/core/bitstreams/d642ec68-a3ec-46d8-812a-958366a84110/content

International Fund for Agricultural Development (IFAD), 2020. Summary of Investment: Great Farm - Babban Gona – Nigeria. https://www.ifad.org/documents/38711624/40206666/SII_Babban+Gona+%28002%29+-+KM.pdf/cbdd3f6a-b647-927d-9992-dd858c6b79a6

International Fund for Agricultural Development (IFAD), 2025. Digital Agriculture in Nigeria: opportunities, challenges and policy recommendations. Digital Advisory Support Services for Accelerated Rural Transformation (DAS). Development Gateway, TechChange, and JengaLab. https://www.digitalagricresources.org/wp-content/uploads/Digital-Agriculture-in-Nigeria.pdf

International Fund for Agricultural Development (IFAD), n.d. Value Chain Development Programme (VCDP) Nigeria. Programme Sheet. Retrieved on April 30th 2025. https://www.ifad.org/en/w/projects/1100001594

International Fund for Agricultural Development (IFAD)/Food and Agriculture Organization Of The United Nations (FAO), 2004. A cassava industrial revolution in Nigeria: The potential for a new industrial crop. https://www.fao.org/4/y5548e/y5548e00.htm#Contents

International Fund for Agricultural Development (IFAD)/Food and Agriculture Organization Of The United Nations (FAO), 2005. A review of cassava in Africa with country case studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin. Proceedings of the validation forum on the global cassava development strategy. Volume 2. https://www.fao.org/4/a0154e/A0154E00.HTM#TOC

ISDA, 2025. Progress Update: Our Growing Partnership with Niger Foods. Retrieved on June 3rd 2025. https://www.isda-africa.com/posts/niger-foods-update/

Japan International Cooperation Agency (JICA), 2024, Federal Republic of Nigeria Data Collection Survey on Agriculture Sector in Nigeria (QCBS) Final Report. NTC International Co., Ltd. Nippon Koei Co., Ltd. https://openjicareport.jica.go.jp/pdf/12376091.pdf

Kabir, A. M, & Abbas, B. (2024). Agribusiness strategies for mitigating risks in the tomato value-chain: from Sokoto fields to markets. Journal of Agricultural Economics, Environment and Social Sciences, 10(2), 57-67. https://www.jaeess.com.ng/index.php/jaeess/article/view/243

Kamai, N., Omoigui, L., Kamara, A., and Ekeleme, F., 2020. Guide to Rice Production in Northern Nigeria. Feed the Future. IITA. USAID. https://www.iita.org/wp-content/uploads/2020/07/Guide-to-Rice-Production-in-Northern-Nigeria.pdf

Kamara, A. Y., Kamai, N., Kanampiu, F., Kamsang, L. and Kamara, A. Y. 2018. Gender analysis of soybean adoption and impact. International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 57pp. https://www.n2africa.org/sites/default/files/Gender%20Analysis%20of%20Soybean%20Adoption%20Impact_.pdf

Kamara, A. Y., Kamsang, L. S., Mustapha, A., Kamara. A. Y., Kolapo, A. and Kamai, N., 2025. Gender disparities in the adoption of improved management practices for soybean cultivation in North East Nigeria. Journal of Agriculture and Food Research, 22 (2025) 102032. Published by Elsevier B.V. https://cgspace.cgiar.org/server/api/core/bitstreams/3f43f22e-8369-4cac-9658-a13d5b7d1b76/content

Kehinde, A. D. and Ogundeji, A. A., 2022. The Simultaneous Impact of Access to Credit and Cooperative Services on Cocoa Productivity in South-Western Nigeria. Published by Springer Nature. BioMed Central. Agriculture and Food Security. https://agricultureandfoodsecurity.biomedcentral.com/counter/pdf/10.1186/s40066-021-00351-4.pdf

Kehinde, A. D. and Ogundeji, A. A., 2022. The simultaneous impact of access to credit and cooperative services on cocoa productivity in South-western Nigeria. Agriculture & Food Security Journal. Article Number 11, 2022. https://agricultureandfoodsecurity.biomedcentral.com/articles/10.1186/s40066-021-00351-4

Kehinde, A. D., Adesiyan, T. F., Hassan, S. O. and Familusi, I. G., 2024. Leveraging on Membership in Agricultural Cooperatives to Alleviate Abject Poverty among Smallholder Farming Households in Nigeria. Sustainable Futures. Science Direct. Published by Elsevier Ltd.. https://www.sciencedirect.com/science/article/pii/S2666188824002478/pdfft?md5=6ad5ca5372f1ec97c6eb177099f4d307&pid=1-s2.0-S2666188824002478-main.pdf

Killebrew, K., Gugerty, M. K., and Plotnick, R. 2010. Poultry Market in West Africa: Nigeria. Evans School Policy Analysis and Research (EPAR). University of Washington. EPAR Brief No. 87. https://epar.evans.uw.edu/wp-content/uploads/2024/08/Evans-UW_Request-87_Poultry-Market-Analysis-Nigeria_June-14-2010_0.pdf

Kolapo, A. and Didunyemi, A. J., 2024. Effects of exposure on adoption of agricultural smartphone apps among smallholder farmers in Southwest, Nigeria: implications on farm-level-efficiency. Agriculture and Food Security. https://agricultureandfoodsecurity.biomedcentral.com/counter/pdf/10.1186/s40066-024-00485-1.pdf

Konkwo, S. O. and Osabuohien, J. I., 2024. Extension Workers' Linkage Mechanisms of Smallholder Rice Farmers to Market in Edo State, Nigeria. Journal of Agriculture and Environment Vol. 20 No. 2, 2024: 79-91. ISSN: 1595-465X (Print) 2695-236X (Online). https://www.ajol.info/index.php/jagrenv/article/download/291033/273961

Lagos Business School (LBS), 2025. Building an Effective Payment System in Nigeria: Challenges, and Opportunities for Seamless Transactions. Sustainable Inclusive Publication. https://sustainabledfs.lbs.edu.ng/2025/01/31/building-an-effective-payment-system-in-nigeria-key-features-challenges-and-opportunities-for-seamless-transactions/

Leadership Newspaper, 2024. Why Digital Payments Is Low Among Traders In Northern Nigeria. Retrieved on May 30th 2025. https://leadership.ng/why-digital-payments-is-low-among-traders-in-northern-nigeria/

Liverpool-Tasie, L. S. O., Belton, B., Tasie, O., Osawe, W., Parkhi, C., Reardon, T., Abagyeh-Igbudu, I., Muhammed, A., Sule, B., Hudu, M. I., Ibrahim, A. L., Onu-Odey, G. E., Emmanuel, A., and James, E. Y. 2021. Pivoting in Nigeria's fish and poultry value chains in response to covid-19 policies and impacts. Nigeria Agricultural Policy Activity. Feed the Future. NAPA Research Paper #1. https://www.google.com/search?q=https://ageconsearch.umn.edu/nanna/record/329233/files/RP01-Pivoting-Nigeria-fishpoultry.pdf

Liverpool-Tasie, S,, Omonona, B., Sanou, A., Ogunleye, W. and Padilla, S., 2017. Growth and transformation of food systems in Africa: evidence from the poultry value chain in Nigeria. Feed the Future Innovation Lab for Food Security Policy. Nigeria Agricultural Policy Project. Policy Research Brief 25. https://www.canr.msu.edu/fsp/publications/policy-research-briefs/policy_brief_25.pdf

Liverpool-Tasie, S., Reardon, T., Sanou, A., Ogunleye, W., Ogunbayo, I., and Omonona, B. T., 2017. The transformation of value chains in Africa: Evidence from the first large survey of maize traders in Nigeria. Feed the Future Innovation Lab for Food Security Policy, Research Paper 91. https://www.canr.msu.edu/fsp/publications/research-papers/fsp%20research%20paper%2091.pdf

Longtau, S. R., 2003. Nigeria Case Study Report on Rice Production. Overseas Development Institute. Working Paper. https://odi.org/documents/2428/3986.pdf

Maduka, O. A. Obinna, L. O. and Maduka, A. G., 2023. Assessment of Gender Roles in Cocoa Production Activities in Abia State, Nigeria. Nigeria Agricultural Journal. Volume 54 Number 1 April 2023 Pg. 214-219. ISSN: 0300-368X. https://www.ajol.info/index.php/naj/article/download/251400/238722#

Makama, S. A., Umar, S. M., Isah, M. A., Sadiq, M. S., and Magaji, B. D., 2022. Socioeconomic factors influencing Maize production in Giwa Local Government Area of Kaduna State, Nigeria. Journal of Agriculture and Environment, 18(2): 135–139. https://www.ajol.info/index.php/jagrenv/article/download/241829/228648

Manufacturing Africa, nd. Developing Africa's Chocolate Industry. Retrieved on May 1st 2025. https://manufacturingafrica.org/developing-africas-chocolate-industry/

Masaki, M. N., Van der Lee, I,. Duns, H., Toromade, F., and Ayo, O. 2020. Poultry Sector Study in Nigeria. Netherlands-African Business Council (NABC). Netherlands Enterprise Agency. https://dutchafricapoultry.com/wp-content/uploads/2021/10/NABC-Nigeria-Poultry-Report-2020-27.06.2020.pdf?utm_source=chatgpt.com

Medium, 2018. Harvest Spotlight: Soybean. Retrieved on May 3rd 2025. https://medium.com/@femiroyale/harvest-spotlight-soybean-bd7f1e1df76d

Medium, 2023. Zowasel's Traceability Pilot Rewards First Cocoa Farmers with Sustainability Premium in Nigeria Retrieved on June 4th 2025. https://medium.com/zowasel/zowasel-pays-traceability-premium-to-cocoa-famers-in-nigeria-c136f83d7927

Medium, 2025. An analysis of Nigeria's cocoa value chain. Retrieved on May 4th 2025. https://medium.com/@debiyi/an-analysis-of-nigerias-cocoa-value-chain-44ca782559a5

MercyCorp, 2021. Ecosystem study of the digital agriculture landscape in Nigeria. Agrifin. Dalberg. Bill and Melinda gates Foundation. https://www.mercycorpsagrifin.org/wp-content/uploads/2022/03/Ecoystem-Study-of-the-digital-agricultural-landscape-in-Nigeria.pdf

Milling Middle and East Africa, 2024. AFEX predicts higher prices for maize, rice in Nigeria 2024. Retrieved April 25th 2025. https://milling-mea.com/afex-predicts-higher-prices-for-maize-rice-in-nigeria-2024/

Muhammed, A. A., Ibrahim, S. and Bako, H., 2021. Level of gender participation in tomato production in the agricultural zone 1 of Niger state, Nigeria. Journal of Agripreneurship and Sustainable Development (JASD). Volume 4, Number 2, June, 2021. ISSN (Print): 2651-6144; ISSN (Online): 2651-6365. https://www.researchgate.net/profile/Hauwa-Bako/publication/

Mukhtar, U., Muktar, B. G., Kabeer M. Y., Idris, A. and Aliyu, A., 2021. Maize value chain review in the Northern Nigeria. Dutse Journal of Agriculture and Food Security (DUJAFS), 8(1). https://www.researchgate.net/profile/Umar-Mukhtar-5/publication/377396205_MAIZE_VALUE_CHAIN_REVIEW_IN_THE_NORTHERN_NIGERA/links/65a40904af617b0d87438c9b/MAIZE-VALUE_CHAIN_REVIEW_IN_THE_NORTHERN_NIGERA.pdf

NairaMetrics, 2023. NIRSAL, Polaris Bank provide N1 billion loan for integrated poultry farm in Oyigbo, Rivers. Retrieved on June 2nd 2025. https://nairametrics.com/2023/12/01/nirsal-polaris-bank-provide-n1-billion-loan-for-integrated-poultry-farm-in-oyigbo-rivers/

NairaMetrics, 2024. Poultry farmers lost N3 trillion in 2023 – PAN. Retrieved on April 24th 2025. https://nairametrics.com/2024/02/05/poultry-farmers-lost-n3-trillion-in-2023-pan/

NairaMetrics, 2024. Seasonal fluctuations push price of fresh tomato basket to N150,000 in Lagos. Retrieved on April 24th 2025. https://nairametrics.com/2024/05/26/seasonal-fluctuations-push-price-of-fresh-tomato-basket-to-n150000-in-lagos/

National Bureau of Statistics (NBS), 2022. National Agricultural Sample Census (NASC) Report 2022.

https://www.nigerianstat.gov.ng/download/1241525

Ndoye, A., Dia, M., and Khadim Dia, K., 2023. Forecasts Brief Series – Nigeria Maize. Africa Agriculture Watch. AKADEMIYA2063. AAgWa Crop Production. https://akademiya2063.org/publications/AAgWa%20Crop%20Production%20Forecasts/AAgWa%20Crop%20Production%20Forecasts%20Series%20No.%2031_Nigeria-Maize.pdf

Netherlands Ministry of Foreign Affairs (2020). Agroberichten Buitenland - Nigeria Sector: Agriculture – Poultry. https://www.agroberichtenbuitenland.nl/binaries/agroberichtenbuitenland/documenten/brieven/2020/10/20/kansenkaarten-nigeria-pluimvee/Kansenkaart+Nigeria-Poultry.pdf

New Nigeria Foundation (NNF), 2008. Soya Value Chain Baseline Survey. Development Associates. PrOpCom. https://nnfng.org/wp-content/uploads/2020/07/soya-value-chain-baseline-survey.pdf

News Agency of Nigeria (NAN), 2024. Heifer International empowers 7,000 poultry farmers on innovative solutions. Retrieved on May 29th 2025. https://nannews.ng/2024/09/25/heifer-international-empowers-7000-poultry-farmers-on-innovative-solutions/

Niger State Special Agro-Industrial Processing Zone (SAPZ), 2025. Maize Processing and Value Addition. Retrieved on June 5th 2025. https://nigersapz.com/maize-processing-and-value-addition/

Nigeria Export Promotion Council (NEPC), nd. Cocoa Information Page. Retrieved on May 3rd 2025. https://nepc.gov.ng/importer/nigeria-product/cocoa/

Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), 2020. Farmers, IDPs in Borno receive the CBN's strategic support for 2020 wet season farming. Retrieved April 30th 2025. https://nirsal.com/2020/10/01/farmers-idps-in-borno-receive-the-cbns-strategic-support-for-2020-wet-season-farming/

Novatia Consulting, 2024. Digital Payments Market Research in Nigeria – A sector on the Rise. Retrieved April 28th 2025. https://novatiaconsulting.com/digital-payments-market-research-in-nigeria/

Nta, S. I., Echono, O. S., Ingoroko, T. S., and Obiomah, K. O., 2024. A comparative profitability analysis of rice production under the anchor borrowers' programme for rice farmers association of Nigeria (RIFAN) in Kaduna, State, Nigeria. Agriculture, Food and Natural Resources Journal. Agr. Foo. Nat. Res. J. Volume 3, Issue 2, Page 247 – 254. e-ISSN: 1597-7153 | p-ISSN: 3043-5420. https://journals.unizik.edu.ng/afnrj/article/download/4720/3859/10755

Nwandu, P. I., 2022. Gender Analysis of Rural Small-Scale Arable Crop Farming in Delta State, Nigeria. Nigerian Journal of Agriculture and Agricultural Technology (NJAAT). Volume 2, Number 2, December, 2022

ISSN (Print): 2811-1885; ISSN (Online): 2811-1893. https://www.researchgate.net/publication/371478533

Obinna, E., Uzoma, I., and Chidume, A., 2020. Profitability Of Actors In Rice Value Chain In Nigeria: A Comparative Analysis, International Journal of Innovative Research and Advanced Studies (IJIRAS). Volume 7 Issue 7, July 2020 ISSN: 2394-4404. https://www.researchgate.net/publication/343361174_Profitability_Of_Actors_In_Rice_Value_Chain_In_Nigeria_A_Comparative_Analysis

Ohidah, D., 2024. Understanding Seasonality in Nigeria; A Case Study of Food Prices. Vestance. Retrieved March 24th 2025 from: https://vestanceng.com/blog/understanding-food-seasonality-in-nigeria

Ojo, T. O. and Baiyegunhi, J. S., 2020. Determinants of Credit Constraints and its Impact on the Adoption of Climate Change Adaptation Strategies among Rice Farmers in South-West Nigeria. Journal of Economic Structures, Springer Open. https://journalofeconomicstructures.springeropen.com/counter/pdf/10.1186/s40008-020-00204-6.pdf

Ojo, T. O.; Ogundeji, A. A.; Babu, Suresh Chandra; Alimi, T. (2020) Estimating financing gaps in rice production in Southwestern Nigeria Journal of Economic Structures, ISSN 2193-2409, Springer, Heidelberg, Vol. 9, Iss. 12, pp. 1-18. https://hdl.handle.net/10419/261559

Okanta, S. U., Ejem, C. A. and Effe-Nnamdi, A. C., 2024. Value Chain Financing: A Survey of Micro/Small Holder Rice Farmers in Southeast, Nigeria. World Journal of Finance and Investment Research. Vol 8. No. 1 2024. E-ISSN 2550-7125 P-ISSN 2682-5902. https://www.researchgate.net/publication/380401571_Value_Chain_Financing_A_Survey_of_MicroSmall_Holder_Rice_Farmers_in_Southeast_Nigeria

Okorie, N. U., Nkeme, K. K. and Umoh, I. U. 2024. Determinants of access to credit among poultry farmers in Abak agricultural zone, Nigeria. Journal of Agricultural Economics, Extension and Science. ISSN (Print) 2545-5179, ISSN (Online) 2714-5018. https://www.researchgate.net/publication/382254976_DETERMINANTS_OF_ACCESS_TO_CREDIT_AMONG_POULTRY_FARMERS_IN_ABAK_AGRICULTURAL_ZONE_NIGERIA/

Okoruwa, V. O., Abass, A. B., Akin-Olagunju, O. A., and Akinola, N. A., 2020. Does institution type affect access to finance for cassava actors in Nigeria? Journal of Agriculture and Food Research. https://pdf.sciencedirectassets.com/776464/1-s2.0-S2666154319X00034/1-s2.0-S2666154320300041/main.pdf

Oladipo, O. and Oyaniran, T., 2018. Boosting Rice Production Through Mechanisation. PWC Advisory Outlook. © 2018 Price Waterhouse Coopers Limited. https://www.pwc.com/ng/en/publications/boosting-riceproduction-through-increased-mechanisation.html

Oladoyin, O. P., Ajayi, O. O., Ibrahim, A. T., and Borokini, E. A., 2025. Determinants and Impact of Credit Utilization among Rural Cocoa Farmers: Evidence from Ondo State, Nigeria. International Journal of Research and Innovation in Social Science (IJRISS) ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue IV April 2025. https://rsisinternational.org/journals/ijriss/Digital-Library/volume-9-issue-4/2651-2663.pdf

Olam Agri Holdings, n.d. Integrated Feed and Protein – Nigeria. Retrieved April 30th 2025. https://www.olamagri.com/locations/nigeria.html

Olaomo, O. K. and Molnar, J. J., 2022. Building an Inclusive Value Chain: Gender Participation in Cassava Marketing and Processing in Nigeria. Environmental Sciences and Ecology: Current Research (ESECR). Volume 3 Issue 8. ISSN: 2833-0811. https://www.corpuspublishers.com/assets/articles/esecr-v3-22-1078.pdf

Olaosebikan, O., Abdulrazaq, B., Owoade, D., Ogunade, A., Aina, O., Ilona, P., Muheebwa, A., Teeken, B., Iluebbeya, P., Kulakow, P., Bakare, M., and Parkes, E., 2019. Gender-based constraints affecting biofortified cassava production, processing and marketing among men and women adopters in Oyo and Benue States, Nigeria. Journal of Physiological and Molecular Plant Pathology. https://tapipedia.org/sites/default/files/1-s2.0-s0885576518300456-main.pdf

Olatinwo, L. K., Yusuf, O. J. and Wahab, M. J., 2024. Farmers' use of phone applications in accessing information for maize production in Kwara state, Nigeria. Journal of Kerbala for Agricultural Sciences Issue (4), Volume (11), (2024). https://www.researchgate.net/publication/387072757

Olodo, E., 2024. The processing tomato market in Africa. The tomato news conference. Information sourced from African Development Bank (AfDB), FAO & TDM. Retrieved on April 29th 2025. https://www.tomatonews.com/en/the-processing-tomato-market-in-africa_2_2256.html

Ologunde, O. H., Busari, M. A., Adebayo, O. E., Olowokere, F. A., Kreye, C., Salako, F. K. and Hauser, S., 2024. Effects of planting date and crop age at harvest on cassava root and starch yield in the derived savanna of southwestern Nigeria. International Institute of Tropical Agriculture (IITA). Kosmos Publishers. https://kosmospublishers.com/effects-of-planting-date-and-crop-age-at-harvest-on-cassava-root-and-starch-yield-in-the-derived-savanna-of-southwestern-nigeria/

Olomola, A. S., 2010. Formal-Informal Institutional Linkages in the Nigerian Agribusiness sector and implications for pro-poor growth. DFID. Consortium for Improving Institutions for Pro-Poor Growth (IPPG). Discussion Paper Series 37. https://assets.publishing.service.gov.uk/media/57a08b0740f0b652dd000a5a/dp37.pdf?utm_source=chatgpt.com

Oluyole, K. A., 2017. The role of Cocoa Buying Agents in cocoa value chain in Southwestern Nigeria. Journal of Agriculture and Rural Research. Volume I Issue I Page 39-43; 2017. https://aiipub.com/wp-content/uploads/2018/08/Volume-I-Issue-I-Page-39-43-2017.pdf

Omiunu, O. G., 2014. Investigating the Challenges Faced by Women Rice Farmers in Nigeria. Africa Regional Centre for Information Science, https://www.scirp.org/pdf/OALibJ_2016031111094716.pdf

Onah, O. G., Enete, A. A., Okoye, C. U., Ume, C. O. and Onyia, C. C., 2022. Impact of Credit Access of Farmers in Cooperative Societies on Financial Performance: the Predictive Effect of Financial Literacy. International Journal of Social Economics. © Emerald Publishing Limited 0306-8293 DOI 10.1108/IJSE-10-2023-0837 https://www.emerald.com/insight/0306-8293.htm

Onomu, A. R. and Aliber, M., 2024. Nigeria's Agriculture and Technology Use: Current Structure and Challenges. Path of Science. 2024. Vol. 10. No 11 ISSN 2413-9009. https://pathofscience.org/index.php/ps/article/download/3385/1600

Onubogu, O. H., 2023. Gender Differences in Agricultural Productivity among Rice Farmers in Anambra State, Nigeria: Drivers and Strategies for A Gender Responsive Agriculture. International Journal of Food Science and Agriculture, 2023, 7(1), 21-28 ISSN Online: 2578-3475 ISSN Print: 2578-3467 https://www.hillpublisher.com/journals/jsfa/

Onuegbu, O. C., Agbamu, B. O., Anyakoha, B. U., and Anunike, O. W., 2025. Communication, awareness and acceptance of digital banking amidst cash crunch in Southeast and South-south Nigeria. Alvan Journal of Social Sciences (AJSS), 2(1). https://arxiv.org/pdf/2504.10546

Onuk, E. G., Girei, A. A. and Amfani-Joe, C.E., 2018. Determinants of Micro Finance Accessibility among Tomato Farmers in Kokona Local Government area of Nasarawa State, Nigeria. International journal of Horticulture, Agriculture and Food science (IJHAF) [Vol-2, Issue-3. ISSN: 2456-8635. https://aipublications.com/uploads/issue_files/4-IJHAF-MAY-2018-5-DeterminantsOf.pdf

Onyediako, P. O. and Adiele, J. G., 2022. Enhanced Cassava Production for Food Security and Economic Development in Nigeria: A review. Nigerian Agricultural Journal. Volume 53 Number 3 December 2022 Pg. 204-211. ISSN: 0300-368X. https://www.ajol.info/index.php/naj/article/download/243491/230282

Onyibe, J. E., Sani, B. M., Baba, D., Chindo, H., Ibrahim, I. K., & Malumfashi, M., 2014. MAIZE - Production, Marketing, Processing and Utilization in Nigeria. Extension Bulletin No. 217. National Agricultural Extension Research Liaison Services. WAAPP-Nigeria. https://naerls.gov.ng/wp-content/uploads/2022/11/MAIZE-Production-Marketing-Processing-Utilization-In-Nigeria.pdf

Onyishi, C. N., Igbo, E. U. M. and Uwakwe, E. E. 2021. Surviving amidst barriers: Community based organizations and rural farmers' access to informal credit in Southeast Nigeria. Taylor and Francis. Local Development & Society Volume 3, 2022 - Issue 2. https://doi.org/10.1080/26883597.2021.1941205

Orji, I. and Iheonu, C., 2023. Nigeria's Poultry Market – Insight Note. Kwakol Research. https://assets-global.website-files.com/618a9de0f5ee92b306a4c52d/65807689e473274bb618bbae_INSIGHT%20NOTE%20-%20Nigeria%E2%80%99s%20Poultry%20Market%20eCopy.pdf

Osunmakinde, M. A., Akerele, E. O., Mufutau, R. A. and Odunsi, V. O., 2023. Marketing analysis of fresh tomatoes in Abeokuta north local government area of Ogun state, Nigeria. Journal of Agribusiness and Rural Development. pISSN 1899-5241, eISSN 1899-5772. https://sciendo.com/3508d34e-a35f-4acb-911f-b291a3aac40a

Otekunrin, O. A., 2024. Cassava (Manihot esculenta Crantz): a global scientific footprint—production, trade, and bibliometric insights. Springer Nature. Discover Agriculture. https://link.springer.com/content/pdf/10.1007/s44279-024-00121-3.pdf

Oyedijo, A., and Akenroye, T., 2023. 5 ways to strengthen Nigeria's poultry supply chain. World Economic Forum (WEF). A research article forming part of the Sustainable Development Impact Meetings. Available online and retrieved on April 10th, 2025. https://www.weforum.org/stories/2023/09/5-ways-to-strengthen-nigerias-poultry-supply-chain/

Oyenpemi, L. O., Solaja, S. O., Fadeyi, B. O., Awe, T. E., Ayojimi, W., Etta-Oyong, S. O., Okonta, O. W. and ,

Oriade, O. A., 2023. Economic performance of smallholder soya bean production in Kwara State, Nigeria. Open Agriculture 2023; 8: 20220100. Published by De Gruyter. https://www.researchgate.net/journal/Open-Agriculture-2391-9531/publication/370520736_Economic_performance_of_smallholder_soya_bean_production_in_Kwara_State_Nigeria/links/6453e946809a53502149bcac/Economic-performance-of-smallholder-soya-bean-production-in-Kwara-State-Nigeria.pdf

Petros Farms. 2023. The daring journey of the fastest growing poultry farm. Retrieved on April 16th 2025. https://petrosfarms.com/2023/09/how-petros-farms-became-the-fastest-growing-poultry-farm-in-nigeria

Philip, D., Jayeoba O. O., Ndripaya. Y. D. and Fatunbi, A. O. (2018). Innovation Opportunities in the Rice Value Chain in Nigeria. FARA Research Report Vol 2(3) PP 48. ISSN: 2550-3359 https://research4agrinnovation.org/publication/innovation-rice-nigeria/

Poultry Association of Nigeria (PAN), 2023. New CBN Forex Policy Threatens N12trn Poultry Industry – Operators. News Article. Retrieved April 23rd 2025. https://poultryassociationofnigeria.org/new-cbn-forex-policy-threatens-n12trn-poultry-industry-operators/

Premium Times, 2023. SPECIAL REPORT: Rural farmers in Nigeria's capital count losses amid poor mobile telephony. Retrieved on May 1st 2025. https://www.premiumtimesng.com/investigationspecial-reports/634757-special-report-rural-farmers-in-nigerias-capital-count-losses-amid-poor-mobile-telephony.html

PricewaterhouseCoopers (PwC), 2021. Positioning Nigeria as Africa's Leader in Maize Production for AfCFTA. https://www.pwc.com/ng/en/assets/pdf/positioning-nigeria-as-africa-leader-in-maize-production-for-afcfta.pdf

PrOpcom, 2007. Commercial Demand for Soybean in Nigeria. DFID. A Survey Report. https://ageconsearch.umn.edu/nanna/record/308692/files/29-Commercial-demand-for-Soybean-in-Nigeria-3-07-1.pdf

Pullus Africa. (nd) How Demand and Supply Affects Poultry Farmers. Retrieved on April 13th, 2025. https://pullusafrica.com/2024/11/18/how-demand-and-supply-affects-poultry-farmers/

Pulse.NG. 2024. Chi Farms expands hatchery production capacity to meet growing demand for day-old chicks. Retrieved on April 16th 2025. https://www.pulse.ng/articles/business/domestic/chi-farms-expands-hatchery-production-capacity-to-meet-growing-demand-for-day-old-202407261055264464 4

Qualigap, 2023. Why price of maize keeps rising. Retrieved April 25th 2025. https://www.qualigap.com/post/why-price-of-maize-keeps-rising

Rentech Digital, 2025. List of Rice Mills in Nigeria. Retrieved March 24th 2025 from: https://rentechdigital.com/smartscraper/business-report-details/list-of-rice-mills-in-nigeria

Renub Research, Nigeria Chicken/Poultry Market Outlook – 2020 to 2033. Retrieved on April 14th, 2025. https://www.renub.com/nigeria-chicken-market-p.php

Research Supporting Africa MSMEs to Provide Safe and Nutritious Foods (RSM2SNF), 2022. Gender and MSMEs in Nigeria's Agrifood Sector with a Gender Evaluation of the RSM2SNF Project. Michigan State University, USA. https://www.canr.msu.edu/fsg/projects/Gender%20and%20MSMEs%20in%20Nigerias%20Agrifood%20Sector.pdf

Research Supporting African MSMEs to Provide Safe and Nutritious Food (RSM2SNF) ii, 2023. Transformation of vegetable value chains in Nigeria: Spatial and seasonal lengthening & intensification. Michigan State University, USA. https://msu-prod.dotcmscloud.com/fsg/projects/%2817%29%20RR%20Working%20Paper%20Vegetables%20Nigeria.pdf

Rural 21, 2024. Nigerian female farmers raise their voice. Retrieved on May 3rd 2025. https://www.rural21.com/english/a-closer-look-at/detail/article/nigerian-female-farmers-raise-their-voice.html

Sahel Capital Partners and Advisory Limited, 2015. An Assessment of the Nigerian Poultry Sector. https://sahelcapital.com/wp-content/uploads/2021/07/Sahel-Newsletter-Volume-11-An-Assessment-of-the-Nigerian-Poultry-Sector.pdf

Sahel Consulting, 2023. Leveraging Innovations for Nigeria's Tomato Value Chain Development. Sahel Quarterly. African Food Changemakers. August 2023. Volume 33. https://sahelconsult.com/wp-content/uploads/2024/05/Sahel_Quarterly_Exploring-the-Constraints-Innovations-and-Opportunities-in-Nigerias-Tomato-Value-Chain-Development-v4.pdf

Sahel Consulting, 2017. MAIZE: Enhancing the livelihoods of Nigerian farmers. Business Newsletter, Vol. 14. https://sahelcapital.com/wp-content/uploads/2021/07/Sahel-Newsletter-Volume-14.pdf

Sahel Consulting, 2024. Exploring the Constraints, Innovations and Opportunities in Nigeria's Tomato Value Chain Development. Sahel Consulting Quarterly. https://sahelconsult.com/wp-content/uploads/2024/05/Sahel_Quarterly_Exploring-the-Constraints-Innovations-and-Opportunities-in-Nigerias-Tomato-Value-Chain-Development-v4.pdf

Sani, I., Gomina, A. and Idi, A. S., 2023. Economic analysis of broiler chicken value chain in Kaduna state, Nigeria. FUDMA Journal of Agriculture and Agricultural Technology. Vol. 9 No. 2, June 2023: Pp. 71-78. ISSN: 2504-9496. https://doi.org/10.33003/jaat.2023.0902.09

Sani, M. H., Kadau, R., Sani, R. M. and Danwanka, H. A., 2023. Analysis of socio-economic characteristics and post-harvest loss storage facilities used by vegetable crops value chain actors in Adamawa state, Nigeria. Nigerian Journal of Agriculture and Agricultural Technology (NJAAT) Volume 3, Number 1, June, 2023. ISSN (Print): 2811-1885; ISSN (Online): 2811-1893. https://www.researchgate.net/publication/371477461

Sanusi, M. S., Mayokun, O. M., Sunmonu, M. O., Yerima, S., Mobolaji, D. and Olaoye, J. O., 2025. Transformative Trends: Commercial Platforms Revolutionizing Rice Farming in Nigeria's Agricultural Value Chain. International Journal of Agricultural Sustainability 2025, Vol. 23, No. 1, 2473757. https://doi.org/10.1080/14735903.2025.2473757

Secondstax, 2024. Concerns as fraudsters increase attacks on banks, N115.9 billion on target in Q3 2024. Retrieved on April 23rd 2025. https://news.secondstax.com/post/5923

Sedi, M., Akinola, A. A., Obunyali, C. O., Adebayo, M. A., Marechera, G., Muungani, D., Mazambani, I., and Oikeh, S. O., 2024. Hybrid Maize Adoption Determinants in Northern Nigeria: A Gendered Perspective. Int J Agriculture Technology. 2024; 4(1): 1-9. ISSN 2770-2928. https://www.scivisionpub.com/pdfs/hybrid-maize-adoption-determinants-in-northern-nigeria-a-gendered-perspective-3123.pdf

Sodeeq, A. E., Ibrahim, A. G., Hamzat, O. A., Oguntade, M. I., Taiwo, O. D. and Adesanlu, A. A., (2021). Profitability of Tomato Marketing and Determinants in Akinyele Local Government Area, Oyo State, Nigeria. Greener Journal of Agricultural Sciences 11(1): 41-47. ISSN: 2276-7770. https://gjournals.org/GJAS/Publication/2021/1/PDF/021621020%20Sodeeq%20et%20al.pdf

Statistica Market Forecast, 2025 I Rice Nigeria. https://www.statista.com/outlook/cmo/food/bread-cereal-products/rice/nigeria?utm_source=chatgpt.com

Steemers, S., Bagu, B. and Adams, S., 2022. Addressing the $200 Billion Demand for Finance for Agriculture and Agribusiness in Nigeria. Commissioned by the Netherlands Enterprise Agency. Ministry of Foreign Affairs of Netherlands. Publication number: RVO-119-2022/RP-INT. https://www.rvo.nl/files/file/2022-05/Finance-for-Agriculture-and-Agribusiness-in-Nigeria.pdf

Steemers, S., Bagu, B. and Adams, S., 2022. Addressing the $200 billion demand for finance for Agriculture and Agribusiness in Nigeria. Agri Logic. Commissioned by the Netherlands Enterprise Agency. Ministry of Foreign Affairs Netherlands. https://www.rvo.nl/sites/default/files/2022-05/Finance-for-Agriculture-and-Agribusiness-in-Nigeria.pdf

Suleiman, M.S., Tafida, I., Nazifi, B. and Inuwa S.I. 2023. Socio-economic analysis of gender participation in poultry production in Kano metropolis, Nigeria. FUDMA Journal of Agriculture and Agricultural Technology. ISSN: 2504-9496 Vol. 9 No. 3, September 2023: Pp. 70-78. https://doi.org/10.33003/jaat.2023.0903.11

Suleiman, N. J., Abdulsalam, Z., Hassan, A. A. and Umar, M., 2024. Mapping the landscape and analyzing the socio-economic portraits of tomato value chain in Kano state, Nigeria. FUDMA Journal of Sciences (FJS). ISSN online: 2616-1370. ISSN print: 2645 – 2944. Vol. 8 No. 3, June, (Special Issue) 2024, pp 383 – 389. https://doi.org/10.33003/fjs-2024-0803-2437

Techeconomy, 2024. FinTechs, Regulations and Nigeria's Financial Inclusion Quest. Retrieved on June 2nd 2025. https://techeconomy.ng/fintechs-regulations-and-nigerias-financial-inclusion-quest/

TechNext 24, 2023. Mobile money account ownership in Nigeria grows by 6% despite various concerns. Retrieved on May 2nd 2025. https://technext24.com/2023/05/18/mobile-money-grows-from-16-to-22/

Technical Centre for Agricultural and Rural Cooperation (CTA), 2019. Cash Usage Behaviour and its Implication for Digital Payments: A case of Ghana and Nigeria's smallholder cassava value chain. CTA Discussion Paper. ISBN: 978-92-9081-647-8. https://cgspace.cgiar.org/server/api/core/bitstreams/8e132058-0b97-4a48-9fdd-79c36bfd4db7/content

The Cable, 2025. Rural communities losing out on DPI benefits due to poor network connectivity. Retrieved on June 5th 2025. https://www.thecable.ng/rural-communities-losing-out-on-dpi-benefits-due-to-poor-network-connectivity/

The Guardian, 2020. Experts suggest solution to reduce post-harvest loss in tomato value-chain. Retrieved April 24th 2025. https://guardian.ng/features/agro-care/experts-suggest-solution-to-reduce-post-harvest-loss-in-tomato-value-chain/

The Guardian, 2024. CBN extends licence renewal of existing BDCs as PoS machines hit 2.7m. Retrieved on May 2nd 2025. https://guardian.ng/business-services/cbn-extends-licence-renewal-of-existing-bdcs-as-pos-machines-hit-2-7m/

The International Trade Administration, U.S. Department of Commerce, 2024. Nigeria Country Commercial Guide. Digital Economy. Retrieved on April 26th 2025. https://www.trade.gov/country-commercial-guides/nigeria-digital-economy

The Junction, 2023. Nigeria Maize Association Promises One Million Jobs Using PPP Model. Retrieved April 30th 2025. https://thejunction.ng/maize-farmers-provide-one-million-jobs-ppp-model/

The Junction, 2024. Top 10 Nigerian Agricultural Exports and How They Are Produced. Retrieved on May 1st 2025. https://thejunction.ng/top-10-nigerian-agricultural-exports-and-how-they-are-produced/

Tobe, L and Vuillaume, R., 2017. Reducing Food Loss in Nigeria Through Solar-Dried Tomatoes. The Rockefeller Foundation. Retrieved April 24th 2025. https://www.rockefellerfoundation.org/perspective/reducing-food-loss-nigeria-solar-dried-tomatoes/

Tridge, 2022. Prices of Cassava in Nigeria. Retrieved on May 20th 2025. https://www.tridge.com/intelligences/mandioca/NG/price

Tridge, 2024. Production of Maize in Nigeria. Retrieved April 30th 2025. https://www.tridge.com/tridge-woods/maize/NG

Udemezue, J. C., Mbanaso, C. I., Obiajulu, I. S., Igboanugo, I. N. and Enibe, D. O., 2025. Cassava value chain in Nigeria: a tool for hunger reduction and employment generation in post COVID 19 era. IPHO-Journal of Advance Research in Agriculture and Environmental Science. Volume-02 | Issue-04. https://www.researchgate.net/profile/Ifunanyachukwu-Igboanugo/publication/388594040_CASSAVA_VALUE_CHAIN_IN_NIGERIA_A_TOOL_FOR_HUNGER_REDUCTION_AND_EMPLOYMENT_GENERATION_IN_POST_COVID_19_ERA/links/679e2381207c0c20fa70843f/CASSAVA-VALUE-CHAIN-IN-NIGERIA-A-TOOL-FOR-HUNGER-REDUCTION-AND-EMPLOYMENT-GENERATION-IN-POST-COVID-19-ERA.pdf

Udemezue, J. C., Okoye, B. C. and Ewuziem, J. E., 2021. Gender Participation in Cassava Production, Processing and Marketing in Anambra State, Nigeria. Advances in Agricultural Technology & Plant Sciences. Volume 4 Issue 1. https://academicstrive.com/AATPS/AATPS180062.pdf

Ugonna, C. U., Jolaoso, M. A. and Onwualu, A. P. 2015. Tomato Value Chain in Nigeria: Issues, Challenges and Strategies. Journal of Scientific Research & Reports 7(7): 501-515, 2015; Article no.JSRR.2015.231 ISSN: 2320-0227. https://www.researchgate.net/publication/278543813

Umoh, G., Essien, E. and Asuquo, K. 2019. Agriculture in Nigeria's economic diversification process: A study of a poultry outgrower scheme. International Journal of Food System Dynamics 10 (4), 2019, 375-385. http://dx.doi.org/10.18461/ijfsd.v10i4.25

United Nations COMTRADE database on international trade (n.d) USA Rice imports from Nigeria in 2024. Retrieved on March 24, 2025. https://comtradeplus.un.org/TradeFlow?Frequency=A&Flows=X&CommodityCodes=1006&Partners=0&Reporters=566&period=2024&AggregateBy=none&BreakdownMode=plus

United Nations Development Programme (UNDP), nd. TOMATO JOS makes retail-packaged food products for consumers across all income brackets. Business case studies. Retrieved on April 29th 2025. https://sdgprivatefinance.undp.org/leveraging-capital/sdg-investor-platform/business-case-studies/tomato-jos-makes-retail-packaged

United Stated Department for Agriculture (USDA). International Production Assessment Division (IPAD). 2025. Nigeria Soybean Area, Yield and Production – Country Summary. Retrieved on May 3rd 2025. https://ipad.fas.usda.gov/countrysummary/Default.aspx?id=NI&crop=Soybean

United Stated Department for Agriculture (USDA). International Production Assessment Division (IPAD). 2025. Nigeria Sub-National Summary: Benue (Nigeria) Soybean. Retrieved on May 3rd 2025. https://ipad.fas.usda.gov/cropexplorer/cropview/ChartSummary.aspx?cropid=2222000&year=2024&subrgnid=wafrica_nga007

United States Department for Agriculture (USDA), Foreign Service. 2024. Nigeria - Oilseeds and Products Annual Report. Report Number: NI2024-0006. Global Agriculture Information Network. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Oilseeds%20and%20Products%20Annual_Lagos_Nigeria_NI2024-0006.pdf

United States Department of Agriculture (Foreign Agricultural Service), 2025. Global Agricultural Information Network. Nigeria: Grain and Agricultural Report Report No: NI2025-0003. March 19, 2025. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain%20and%20Feed%20Annual_Lagos_Nigeria_NI2025-0003.pdf

United States Department of Agriculture (USDA) ii, 2023. Government Implements Temporary Import Tax Waivers for Selected Agricultural Products. Global Agricultural Information Network. Report Number: NI2024-0011. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Government%20Implements%20Temporary%20Import%20Tax%20Waivers%20for%20Selected%20Agricultural%20Products_Lagos_Nigeria_NI2024-0011.pdf

United States Department of Agriculture (USDA), 2023. Grain and Feed Update Report. Global Agricultural Information Network. Report Number: NI2023-0008. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain+and+Feed+Update_Lagos_Nigeria_NI2023-0008.pdf

Usman, J. and Bakari, U.M., 2013. Profitability of Dry Season Tomato (Lycopersicon esculentum Mill.) Production in Fufore Local Government Area of Adamawa State Nigeria. The International Journal Of Engineering And Science (IJES) ||Volume|| 2 ||Issue|| 11 ||Pages|| 113-117 || 2013 || ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805. https://www.theijes.com/papers/v2-i11/Part.1/N02110101130117.pdf

Value Chain Analysis for Development (VCA4D), 2022. Maize Value Chain Analysis in Nigeria. European Commission. https://capacity4dev.europa.eu/media/127209/download/4efa3f10-5ae4-4dbc-b628-15d7b038a809_en

Vanguard Newspapers, 2021. Agro firm invests N4bn into poultry production in three states. Retrieved on April 15th 2025. https://www.vanguardngr.com/2021/11/agro-firm-invests-n4bn-into-poultry-production-in-three-states/

VerivAfrica, 2025. Overcoming Financing Barriers for Agricultural SMEs in Nigeria: Challenges and Opportunities for Growth. Retrieved on June 1st 2025. https://www.verivafrica.com/insights/overcoming-financing-barriers-for-agricultural-smes-in-nigeria-challenges-and-opportunities-for-growth

World Bank (WB). 2024. Gender Gaps in Agriculture Productivity and Public Spending in Nigeria. Nigeria Gender Innovation Lab. https://documents1.worldbank.org/curated/en/099091823113036874/pdf/P175095086510b001080e30d147463456d6.pdf

World Bank Group (WB) i, 2024. Data From the Global Findex 2021: Digitalizing Agricultural Payments in Sub-Saharan Africa Retrieved on May 2nd 2025. https://www.worldbank.org/en/publication/globalfindex/brief/data-from-the-global-findex-2021-digitalizing-agricultural-payments-in-sub-Saharan-africa

World Food Programme (WFP) and Global Alliance for Improved Nutrition (GAIN), 2022. Critical Review of the Economic Feasibility and Cost Analysis of Rice Fortification in Nigeria. A Report. The Nigeria Agribusiness Register. https://www.gainhealth.org/sites/default/files/publications/documents/Critical-Review-of-the-Economic-Feasibility-and-Cost-Analysis-of%20Rice-Fortification-in-Nigeria.pdf

World Integrated Trade Solution (WITS), 2023. Nigeria Manioc (cassava) starch exports by country in 2023. Retrieved on May 2nd 2025. https://wits.worldbank.org/trade/comtrade/en/country/NGA/year/2023/tradeflow/Exports/partner/ALL/product/110814

World Vegetable Centre, 2021. Paste in Process. Retrieved on May 28th 2025. https://avrdc.org/paste-in-process/

Wossen, T., Menkir, A., Alene, A., Abdoulaye, T., Ajala, S., Badu-Apraku, B., Gedil, M., Mengesha, W., and Meseka, S., 2023. Drivers of transformation of the maize sector in Nigeria. Global Food Security, 100713. https://pmc.ncbi.nlm.nih.gov/articles/PMC10519283/pdf/main.pdf

Wossen, T., Speilman, D. J., Alene, A. D. and Abdoulaye, T., 2024. Estimating seed demand in the presence of market frictions: Evidence from an auction experiment in Nigeria. Journal of Development Economics 167 (2024) 103242. Published by Elsevier. https://pmc.ncbi.nlm.nih.gov/articles/PMC10831485/pdf/main.pdf

This publication has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI. Funding for this work was provided by the Gates Foundation.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A world free of hunger and malnutrition

IFPRI is a CGIAR Research Center

1201 Eye Street, NW, Washington, DC 20005 USA | T. +1-202-862-5600 | F. +1-202-862-5606 | Email: ifpri@cgiar.org | www.ifpri.org | www.ifpri.info