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Nigeria's Agrifood System

Structure and Drivers of Transformation

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Introduction

Nigeria experienced a rise and fall in economic growth over the past two decades. The economy experienced strong growth, averaging 7 percent per year, from 2000 to 2014. Then falling world oil prices caused an abrupt decline in Nigeria's GDP in 2015 and 2016 and the country entered its first recession in nearly 20 years. Since then, the economic growth rate has remained below the population growth rate, complicating efforts to reduce poverty in a country with the world's second-largest number of poor people (80 million) (World Bank 2022a). Various other factors contributed to sluggish economic growth, including the spread of insecurity and conflict across almost all areas of the country; policies related to COVID-19 in 2020 and 2021 (Andam et al. 2020); the effects of the Russia-Ukraine war (Diao and Thurlow 2023); and general macroeconomic instability (World Bank 2022b). Nigeria's GDP growth is projected to remain low at 2.9 percent in 2023 and 2024, barely exceeding the population growth rate (World Bank 2022c). First quarter growth in 2023 was only 2.3 percent, reflecting the impact of cash restrictions imposed by monetary authorities during the election campaign period (NBS 2023).

Diversification away from oil dependency toward growth in the agriculture sector will be needed to ensure sustained and inclusive economic growth. Nigeria's agriculture sector contributed around 26 percent of total GDP in 2020 and 24 percent in 2021 (AU 2023). Agriculture provides employment for around 51 percent of the labor force, according to the 2018/19 household survey (IMF 2023). Because the sector supports the livelihoods of many Nigerians, it can serve as a counterbalance to the large oil sector, which is associated with very limited redistribution of wealth. In this brief, we unpack the historical and projected economic growth trajectory further to better understand the role of agriculture as well as the broader agrifood system (AFS) in the performance and transformation of Nigeria's economy. The analysis is aimed at providing a useful decision-making framework, especially in the wake of Nigeria's recent elections and transitions of federal and state administrative governments in May 2023, as well as the recent announcement of macroeconomic reforms, including removal of fuel subsidies and a focus on agricultural production and processing, from President Tinubu's new administration.

The AFS is a complex network of actors who are connected by their roles in supplying, consuming, and governing agrifood products and jobs. Just as an economy undergoes transformations as a country

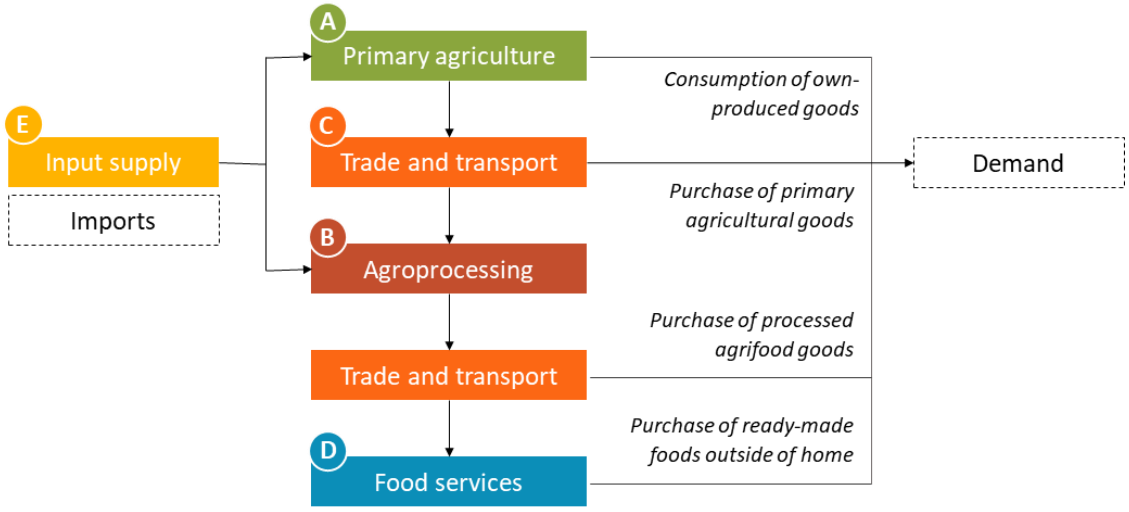
develops, agrifood systems are also expected to evolve (Diao, Hazell, and Thurlow 2010; Timmer 1988). Subsistence farming typically dominates agriculture during the earliest stages of development; as agricultural productivity rises, however, farmers start to supply surplus production to markets, thus creating job opportunities for workers in the nonfarm economy both within and outside the agrifood sectors (Haggblade, Hazell, and Dorosh 2007). Rising rural incomes generate demand for more diverse products; this leads to more nonfarm activities such as processing, packaging, transporting, and trading. In the early stages of transformation, the agriculture sector serves as an engine of rural—and even national—economic growth. Eventually, urbanization, the nonfarm economy, and nonagricultural incomes play more dominant roles in propelling agrifood system development, with urban and rural nonfarm consumers creating most of the demand for agricultural outputs via value chains that connect rural areas to towns and cities (Dorosh and Thurlow 2013). The exact nature of this transformation process varies across countries because of the diverse structure of their economies and the unique growth trajectories of their various agrifood and nonfood subsectors.

This brief describes the current and changing structure of Nigeria's AFS and evaluates the potential contribution of different value chains to the acceleration of agricultural transformation and inclusiveness. We start by offering a simple conceptual framework of the AFS and then compare Nigeria's AFS with that of other countries at different stages of development. We go on to disaggregate Nigeria's AFS across agricultural value chains, taking into consideration their different market structures and historical contribution to economic growth and transformation. Finally, we use a forward-looking economywide model to assess the diverse contributions that specific value chains can make to each of a set of broad development outcomes. We conclude by summarizing our main findings.

A Simple Conceptual Framework of the Agrifood System

A country's AFS is a complex network of actors who are connected by their differing roles in supplying, using, and governing agrifood products (see Fanzo et al. 2020 for a detailed conceptual description of the AFS). In this brief, rather than examining all components of Nigeria's AFS, we employ a narrower focus. We first measure its size, structure, and historical contribution to economic growth and transformation through a data-driven exercise; second, we use the International Food Policy Research Institute (IFPRI) Rural Investment and Policy Analysis (RIAPA) model (IFPRI 2023a) to assess the effectiveness of AFS growth (led by productivity gains in different agricultural value chains) in promoting multiple development outcomes in Nigeria. Our measurement of the AFS is done from a supply-side perspective; that is, we use national accounts and employment statistics to either track or simulate growth and employment changes over time. By disaggregating the AFS into several value chain groups, this analysis offers a unique and useful perspective on the drivers of AFS growth and transformation.

Figure 1. A simple conceptual framework of the agrifood system



Source: Thurlow et al. (2023).

Figure 1 provides a simple conceptual framework of the AFS made up of five components, A to E (see Thurlow et al. 2023). *Primary agriculture* (A) comprises the supply and demand of all agricultural products including crops, livestock, fisheries, and forestry products. *Agroprocessing* (B) is part of the manufacturing sector and includes those subsectors that process agriculture-related food or nonfood products. *Trade and transport services* (C) includes those services associated with the transporting, wholesaling, and retailing of agrifood products between farms, firms, and final points of sale. *Food services* (D) includes services such as meals prepared at restaurants, food stalls, or hotels. Finally, *input supply* (E) is the portion of domestically produced intermediate inputs that is used directly in agricultural and agroprocessing production, such as fertilizers and financial services.

Using this conceptual framework, it is possible to measure the size and structure of Nigeria's AFS from a supply-side perspective. Following the definitions of Thurlow et al. (2023), AFS GDP (or AgGDP+) is the sum of the GDP contributions of the five components (A to E), while AFS employment (or AgEMP+) is the total number of jobs across those components. As the economy grows and transforms over time, there will be changes in the relative contributions of the various on-farm and off-farm components of the AFS to total AgGDP+ or AgEMP+. A transforming economy, for example, will typically be characterized by more rapid growth in the off-farm components of the AFS; there will thus be an increased contribution by off-farm components to AgGDP+ and AgEMP+ and a relative decline in the contribution of primary agriculture. By disaggregating AgGDP+ and AgEMP+ by specific agricultural value chains, we can further assess the contribution of each of those value chains to AFS growth and transformation.

Current Structure of Nigeria's Agrifood System

Table 1 presents the structure of Nigeria's AFS in 2019 based on official national accounts data and sectoral employment statistics (CBN 2020; ILO 2020), as compiled in a 2019 Social Accounting Matrix (SAM) for Nigeria (IFPRI 2023b). National estimates are broken down into estimates for the AFS (that is, AgGDP+ and AgEMP+) and the rest of the economy. The AFS is further broken down into its on-farm (primary agriculture) and off-farm components. The estimates for manufacturing and services (including the trade and transport services subsector) at the bottom of the table include activities in both

the AFS and non-AFS sectors; they provide a perspective on the relative size of the off-farm AFS components within the overall manufacturing and services sectors.

Table 1. Current structure of Nigeria's agrifood system and economy (2019)

	GDP		Employment	
	Value (US$ billion)	Share (%)	Workers (million)	Share (%)
Total economy	**469.3**	**100.0**	**66.8**	**100.0**
Agrifood system	**175.3**	**37.4**	**41.9**	**62.7**
Primary agriculture (A)	**103.3**	**22.0**	**32.2**	**48.2**
Off-farm AFS	**72.0**	**15.3**	**9.7**	**14.5**
Processing (B)	24.1	5.1	1.7	2.6
Trade and transport (C)	41.3	8.8	7.4	11.1
Food services (D)	3.1	0.7	0.3	0.4
Input supply (E)	3.4	0.7	0.3	0.4
Rest of Economy	**294.0**	**62.6**	**24.9**	**37.3**
Total manufacturing	54.6	11.6	5.3	8.0
Total services	236.1	50.3	27.1	40.6
Total trade and transport	88.0	18.8	14.7	22.0

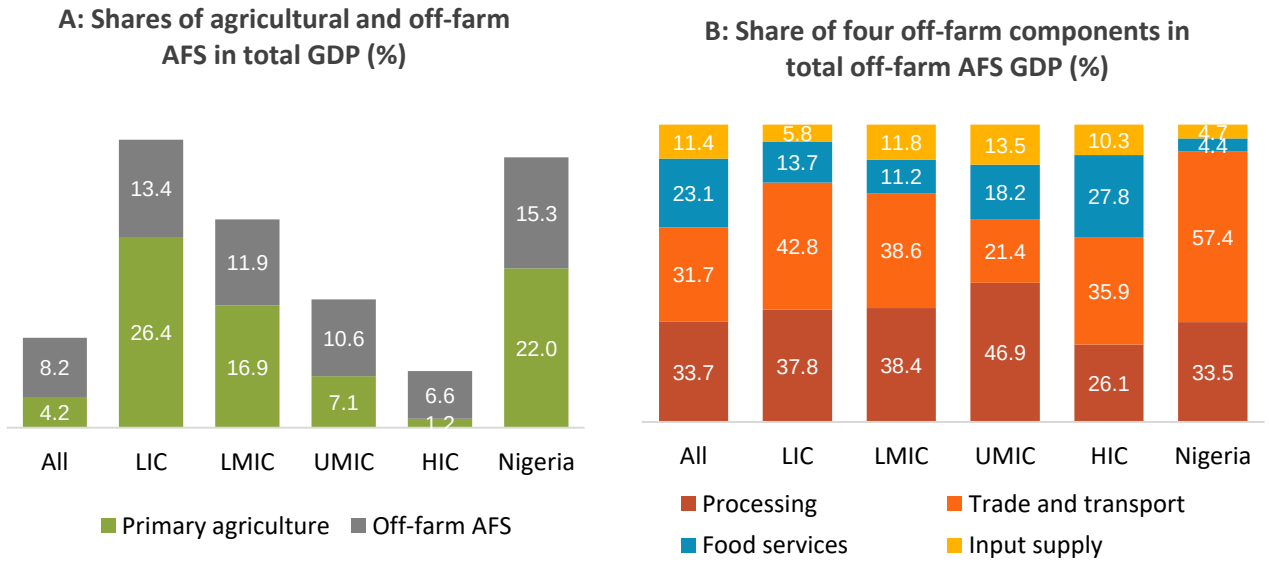
Source: Authors' calculation based on the 2019 Social Accounting Matrix for Nigeria (IFPRI 2023b).
Note: A to E correspond to the five agrifood system (AFS) components from Figure 1.

Table 1 shows that in 2019 the AFS accounted for about one-third of Nigeria's total GDP and two-thirds of total employment, while agriculture alone represented one-fifth of total GDP and nearly half of total employment. The four off-farm components together account for about 40 percent of AgGDP+ and 20 percent of AgEMP+. The comparison of on- and off-farm GDP and employment shares shows that labor productivity in the off-farm components of the AFS is significantly higher than on-farm productivity. The movement of farm workers into these off-farm components—a natural process of agricultural transformation—may thus be beneficial to household incomes.

Comparing Nigeria's Agrifood System to Other Countries

The structure and economic contribution of a country's AFS varies at different stages of its development. Evidence of this is provided in Figure 2, which compares the 2019 AFS structures of low-income (LIC), lower-middle-income (LMIC), upper-middle-income (UMIC), and high-income countries (HIC). Nigeria is an LMIC and its share of AFS in total GDP falls between LIC and LMIC averages (Panel A). For the four off-farm components of the AFS, Nigeria's off-farm structure of the AFS is close to the LMIC average.

Figure 2. Comparing Nigeria's agrifood system to other countries (2019)

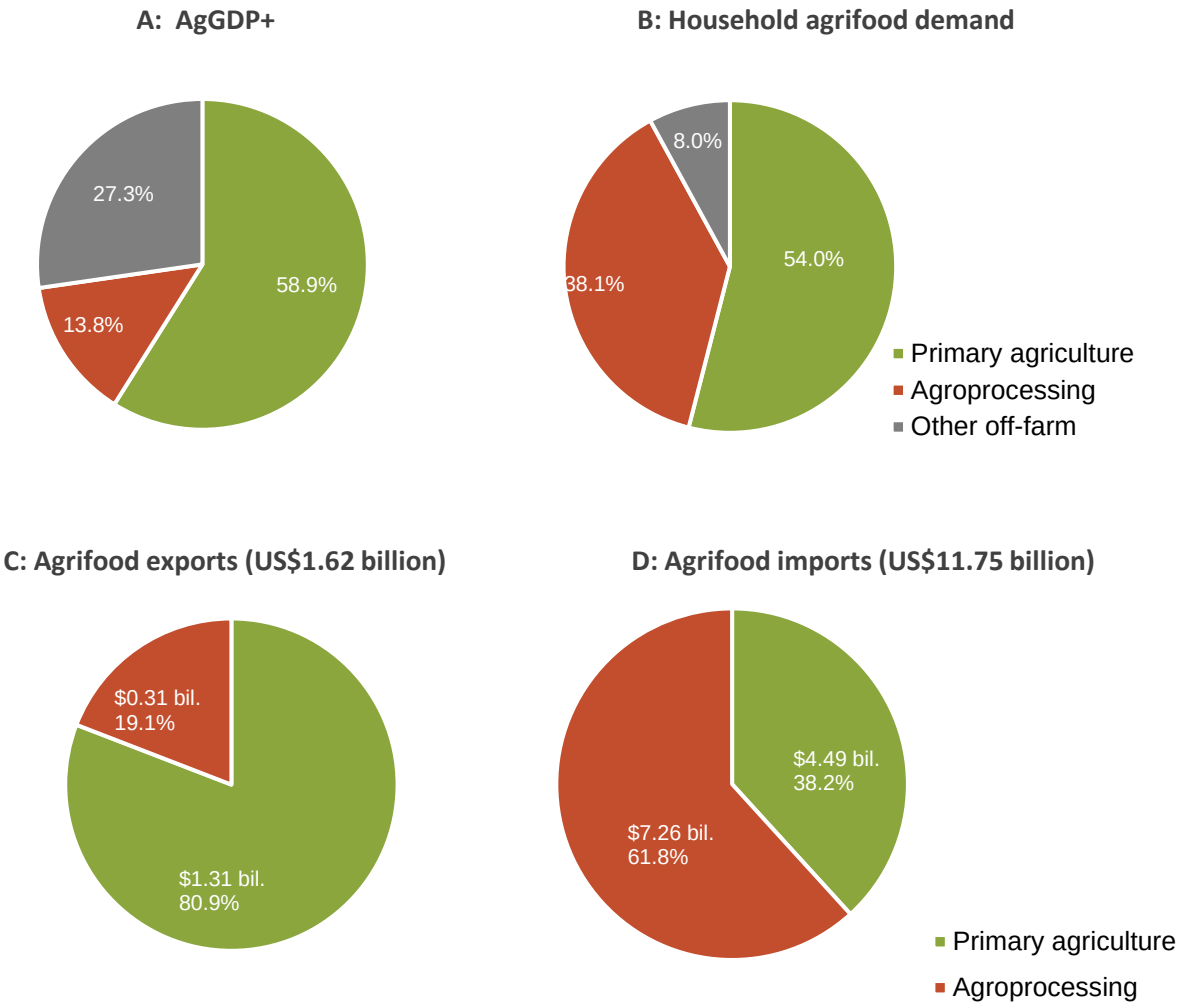


Source: IFPRI's Agrifood System Database (Thurlow et al. *2023*) and the 2019 Social Accounting Matrix for Nigeria (IFPRI 2023b).
Note: LIC = low-income country; LMIC = lower-middle-income country; UMIC = upper-middle-income country; and HIC = high-income country.

Unpacking the demand side of Nigeria's agrifood system

In Figure 3, the structure of Nigeria's AFS from the supply side, as measured by AgGDP+ (Panel A), is compared to the structure of the AFS from the demand side, as measured by household consumption of agrifood products (Panel B). While 68.9 percent of AgGDP+ is from primary agriculture, primary agricultural commodities account for only 54.0 percent of household demand. In contrast, household demand for processed agrifood products accounts for 38.1 percent of total agrifood demand, even though the associated sector accounts for only 13.8 percent of AgGDP+. The bias toward processed agrifood products is mirrored in the high share of agrifood imports accounted for by processed products; that is, 80.9 percent of agrifood commodity exports are primary agricultural commodities (Panel C), but 61.8 percent of imports are processed goods (Panel D). Figure 3 also shows that value of agrifood imports is 10 times that of the exports, and primary agricultural imports alone are nearly 3 times the exports of primary and processed agricultural products together (Panel B). Competition with imports of both primary and processed agricultural products is a challenge for Nigeria's agrifood system transformation.

Figure 3. Composition of agrifood system GDP, household demand, and trade (2019)



Source: Authors' calculation based the 2019 Social Accounting Matrix for Nigeria (IFPRI 2023b).

Disaggregating the Agrifood System across Value Chains

For a more detailed assessment of structural and historical growth patterns within the AFS, we group Nigeria's agrifood system into 14 value chain groups (see Table A1 in the Appendix for details on how individual value chains (or subsectors) are mapped to value chain groups). The 14 value chain groups are further categorized into three subgroups based on their trade orientation. Exportable and importable value chains are defined, respectively, as those value chains with export–output and import–consumption ratios above the national average. Trade in both primary and processed agrifood products is considered in the calculation of these trade ratios. The remaining value chains are classified as less-traded value chains.

Table 2 shows the 14 value chain groups, categorized into exportable, importable, and less-traded value chains. The table also reports the contribution of each value chain group to AgGDP+, primary agricultural GDP, and GDP in the off-farm components of the AFS.

Table 2. Nigeria's agrifood system composition by trade orientation of value chains (2019)

	Share of GDP (%)			Exports / output (%)	Imports / demand (%)
	AFS (AgGDP+)	Primary agriculture	Off-farm AFS		
Total	**100**	**100**	**100**	**0.6**	**4.3**
Exportable	**3.2**	**2.4**	**4.5**	**12.1**	**2.4**
Export crops	3.2	2.4	4.5	12.1	2.4
Importable	**18.2**	**12.9**	**27.0**	**0.5**	**17.1**
Rice	3.6	2.6	5.1	0.0	12.5
Other cereals	7.5	5.5	10.7	0.1	17.2
Other crops	3.6	0.8	8.2	1.8	26.0
Fish	3.6	3.9	3.0	0.6	8.0
Less traded	**78.6**	**84.7**	**68.4**	**0.3**	**0.6**
Maize	4.0	4.0	4.1	0.0	0.4
Root crops	17.0	22.5	8.1	0.0	0.0
Cowpea	4.4	5.6	2.3	0.0	0.0
Soybeans	0.8	1.0	0.5	0.0	0.0
Other oilseeds	9.8	11.7	6.7	1.7	0.8
Horticulture	32.2	32.2	32.3	0.3	0.6
Cattle and milk	3.8	2.5	6.1	0.2	3.2
Other livestock	3.9	4.3	3.3	0.0	0.2
Forestry	2.5	1.0	5.1	0.0	1.6

Source: Authors' calculation based on the 2019 Social Accounting Matrix for Nigeria (IFPRI 2023b).

Consistent with Figure 3, Table 2 shows that the domestic market dominates Nigeria's agrifood system, with an import–demand ratio of 4.3 percent, which is seven times the export–output ratio of 0.6 percent. Nine of the 14 value chain groups are classified as less-traded value chains because both their export–output and import–demand ratios are below the national average for AFS value chains. Less-traded value chains account for 78.6 percent of total AFS GDP. These value chains service mainly domestic markets, including farmers' home consumption, which requires minimal processing and trade and transport services through markets. Thus the less-traded value chains group has a disproportionately large on-farm AFS GDP share of 84.7 percent, which exceeds its off-farm GDP share of 68.4 percent. The cattle and milk value chain is an exception in that it is associated with significant value addition (such as meat processing and dairy products), even though the value chain is less exposed to global markets. Only one value chain group, which includes cocoa and coffee, can be classified as exportable. Exportable value chains thus account for a small share of total AFS GDP (3.2 percent). There are four importable value chains that account for a disproportionate share of off-farm AFS (27 percent of the total). These value chains not only compete with primary agricultural imports but also with processed

agrifood imports. Promoting some importable value chains and cattle and milk (less traded) could thus effectively drive agricultural transformation by boosting value added and employment in off-farm AFS.

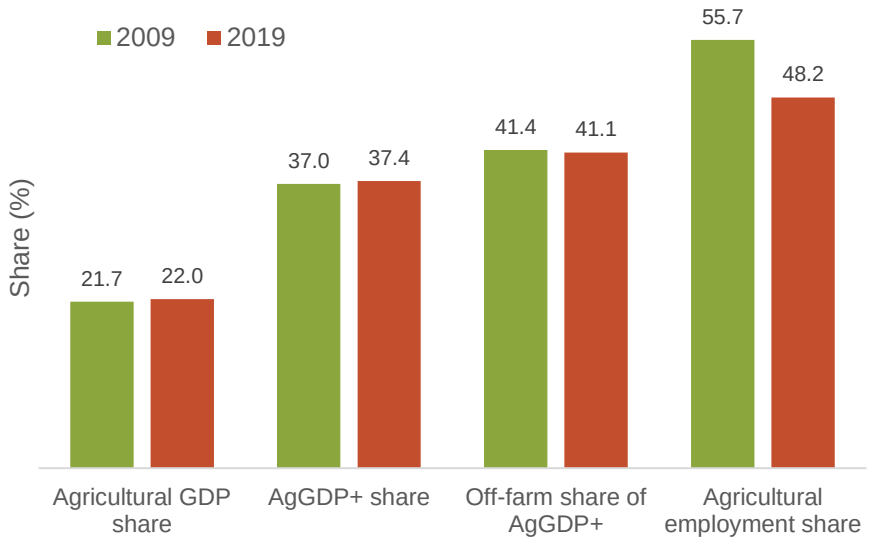
Structural Change and Drivers of Agrifood System GDP Growth

The previous sections have provided a snapshot of the current structure of Nigeria's AFS, the decomposition of 14 value chain groups, as well as trade orientation of different value chains. The analysis shows that domestic market-oriented value chains dominate Nigeria's agrifood system. Less-traded value chains are generally less dependent on off-farm activities than importable value chains. Value chains with more market opportunities and off-farm components could be more effective for expanding off-farm value added and creating more off-farm jobs in agrifood system transformation.

In this section we assess the performance and structural transformation of Nigeria's AFS in recent years. Labor productivity is typically lowest in primary agriculture, and higher in off-farm activities, such as in agrifood processing, food services, or in sectors outside of the AFS. Economic growth and urbanization are associated with relatively faster growth in these nonagricultural sectors, which could help create higher-paying jobs for both rural and urban households. As such, even smallholder farm households with family members who obtain off-farm employment may benefit from structural transformation.

Figure 4 compares the shares of agricultural GDP and AgGDP+ in Nigeria's national GDP, as well as agricultural employment as a share of total employment between 2009 and 2019. The figure also includes an estimate of the share of the off-farm components in AgGDP+. Agricultural GDP and AgGDP+ shares did not change much between 2009 and 2019, and the off-farm component of AgGDP+ was also stable. However, the agricultural share of total employment fell significantly, from 55.7 percent in 2009 to 48.2 percent in 2019. This indicates that structural change has occurred in the Nigeria's broader economy and that agricultural labor productivity improved modestly. However, agriculture continues to be the largest sector in total economy's employment as well within the AFS.

Figure 4. Agricultural GDP, agrifood system GDP, and employment shares (2009 and 2019)



Source: Authors' calculation using the 2009 and 2019 Social Accounting Matrixes for Nigeria (IFPRI 2023b).

Table 3 evaluates the growth performance across AFS value chains over the 2009 to 2019 period. As before, value chains are grouped according to their trade status, that is, exportable, importable, and less traded. Overall, Nigeria's AFS grew modestly, and annual average GDP growth rates were less than 4 percent both on-farm and off-farm. Only processing agriculture grew at 4 percent per year during the 2009 to 2019 period.

Among the 14 value chains, 7 achieved more than 5.0 percent annual growth rate during the 2009 to 2019 period (these are marked with an asterisk in Table 3). Two fast-growing value chains are importable (other cereals and fish), and four are less traded (cowpeas, soybeans, other oilseeds, and forestry). The only exportable value chain (export crops) also grew rapidly. For most value chains that achieved more than 5.0 percent annual growth, their processing components grew faster than the primary agriculture component. This is consistent with the broader patterns of growth and structural change in Nigeria's AFS, which shows that growth in the on- and off-farm components of the AFS was modest and similar, but processing agricultural GDP grew relatively more rapidly.

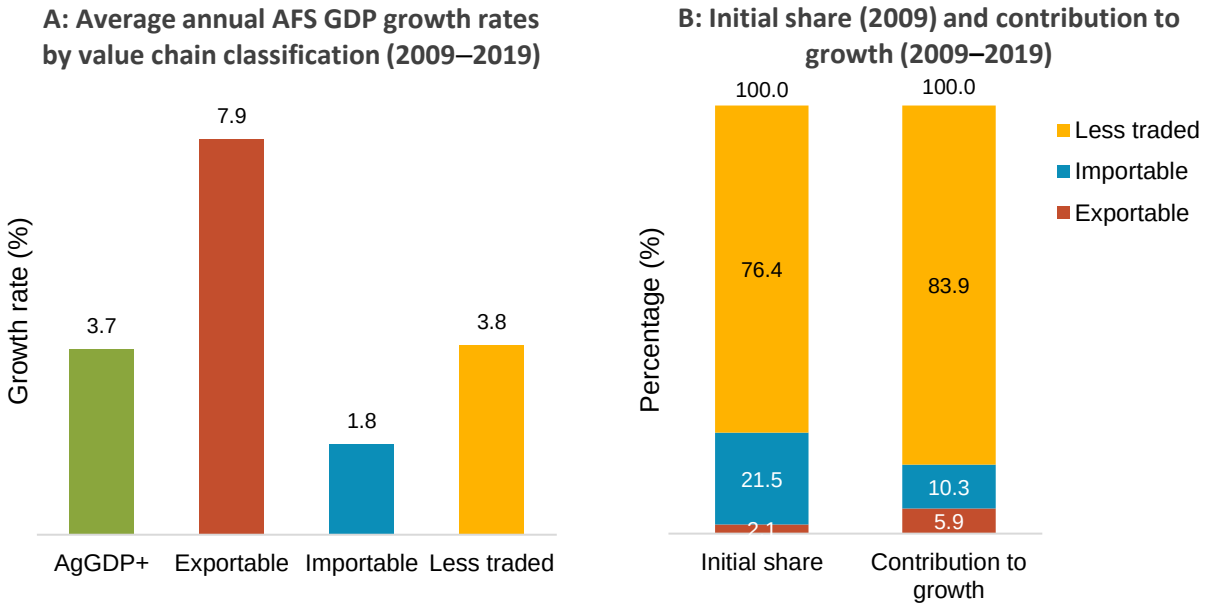
Table 3. Agrifood system GDP growth rates by value chain (2009–2019)

	Average annual GDP growth rate (%)			
	Total AFS	Primary agriculture	Off-farm AFS	Agro-processing
Total AFS	**3.7**	**3.8**	**3.6**	**4.0**
Exportable	**7.9**	**6.8**	**9.0**	**9.9**
Export crops*	7.9	6.8	9.0	9.9
Importable	**1.8**	**2.8**	**1.1**	**-1.1**
Rice	4.8	8.8	2.3	-0.9
Other cereals*	5.2	4.3	6.0	8.2
Other crops	-5.6	-10.6	-4.4	-6.2
Fish*	5.6	4.7	7.7	2.6
Less traded	**3.8**	**3.9**	**3.7**	**6.3**
Maize	4.1	6.2	1.4	0.5
Root crops	-0.2	0.1	-1.4	
Cowpea*	6.4	7.2	3.9	3.3
Soybeans*	5.9	6.4	4.5	
Other oilseeds*	8.7	9.6	6.3	9.3
Horticulture	4.9	5.1	4.7	6.3
Cattle and milk	4.8	2.5	6.9	10.5
Other livestock	2.4	2.9	1.5	8.2
Forestry*	5.4	4.0	5.9	5.5

Source: Authors' calculation using the 2009 and 2019 Social Accounting Matrixes for Nigeria (IFPRI 2023b).
Note: Value chains that experienced more than 5.0 percent of annual growth over the period 2009–2019 are marked with an asterisk (*).

Figure 5 summarizes the key growth trends from Table 3. On average, less-traded (3.8 percent) and exportable (7.9 percent) value chains grew faster than the national AgGDP+ (3.7 percent) (Panel A). Since the exportable value chain only makes up a small share of the AFS (2 percent), the large less-traded group of value chains contributed the most to growth, that is, 83.9 percent (Panel B), indicating that the domestic market has been the driving force for AFS growth in Nigeria in recent years.

Figure 5. Drivers of Nigeria's AFS GDP growth (2009–2019)



Source: Authors' calculation using the 2009 and 2019 Social Accounting Matrixes for Nigeria (IFPRI 2023b).

Assessing Growth Outcomes Using IFPRI's RIAPA Model

IFPRI's Rural Investment and Policy Analysis (RIAPA) model is a tool for conducting forward-looking, economywide country-level analysis (IFPRI 2023a). RIAPA has been used in a wide variety of contexts to simulate the impacts of policies, investments, or economic shocks. Here we employ RIAPA to assess the effectiveness of productivity-led growth in different agricultural value chain groups in Nigeria to promote multiple development outcomes. The analysis was carried out for 11 value chain groups, which were selected from the original list of 14; other oilseeds, other crops, and forestry were excluded. We considered five development outcomes:

- A poverty–growth elasticity that measures the percentage-point change in the poverty headcount rate per unit of agricultural GDP growth generated within the targeted value chain;
- A growth multiplier that measures the change in GDP per unit of increase in agricultural GDP in the targeted value chain;
- An employment multiplier that measures the change in the number of jobs created per unit of increase in agricultural GDP in the targeted value chain;
- A diet-quality indicator that measures the percentage change in a diet quality index per unit of agricultural GDP growth generated within the targeted value chain; and
- A hunger–growth elasticity that measures the percentage-point change in the rate of undernourishment per unit of agricultural GDP growth generated within the targeted value chain.

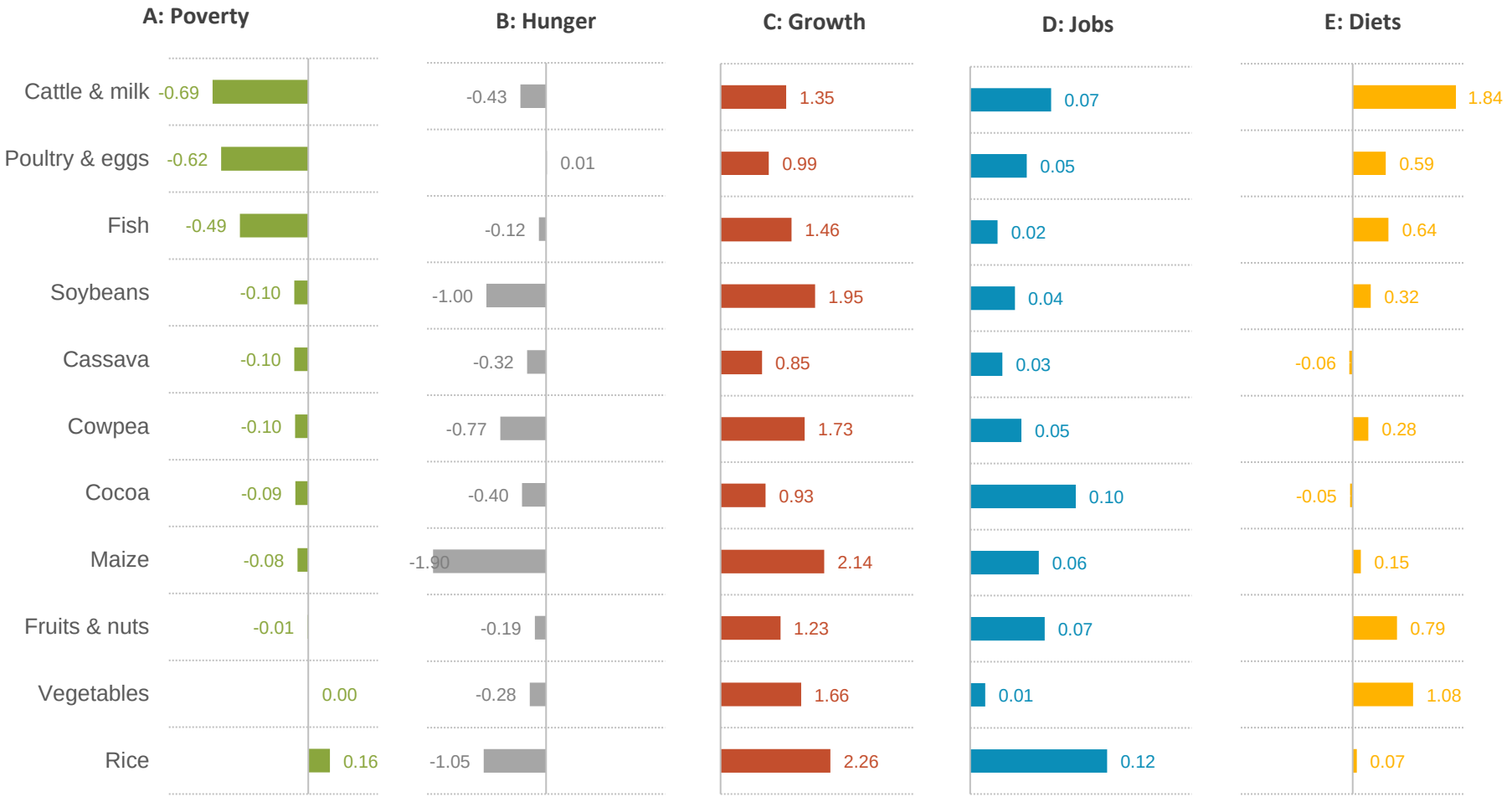
The simulations entail increasing on-farm productivity separately in each targeted value chain and comparing development outcomes across the value chains. While this exogenous productivity shock is imposed only in the primary agriculture component of each value chain, there are spillover effects into that value chain's off-farm components as well as into other agricultural value chains or sectors outside the AFS. These spillovers are captured by the economywide model and provide an indication of the transformation effect that agricultural productivity growth in the value chain has within the AFS and the broader economy. There are also structural differences across value chains; for example, value chains have unique links to other sectors as suppliers or users of intermediate inputs, or they have unique links to rural or urban households in different income groups because of the types of workers they employ or the consumption preferences of households for the agrifood products produced by those value chains.

As such, each value chain growth scenario is expected to have a unique impact on the development outcomes; moreover, not all value chains will be equally effective at improving outcomes. In some cases, there may even be trade-offs due to competition for resources across value chains. With the aid of the RIAPA model, these complex effects can be unpacked, thus providing information to governments or development partners that can be used to prioritize across different value chains; this is subject, of course, to the development outcomes they value most highly.

Figure 6 shows the scores each value chain achieves across the five development outcome indicators. We arbitrarily rank the value chains by their poverty score. Value chains clearly differ significantly in terms of their effectiveness in improving different development outcomes. The cattle and milk value chain, for example, is most effective at improving diet quality and has strong poverty effects, but it is relatively less effective in creating jobs or increasing GDP. In contrast, the rice value chain has a growth multiplier of 2.26 (the highest of all value chains), which means that for every US$1.00 increase in GDP in rice production driven by rising productivity, an additional US$1.26 is generated in total GDP, that is, US$1.26 is generated either in the off-farm components of the rice value chain or in other value chains or sectors of the economy. The rice value chain also scores well on job creation but ranks the lowest in the poverty outcome; in fact, with rice-led growth the national poverty rate rises.

These results highlight the possible trade-offs that may emerge when prioritizing individual value chains, as there is no single value chain that is the most effective at achieving every development objective. Promoting a few value chains jointly will not only diversify agricultural growth; it can also help to simultaneously achieve multiple development objectives.

Figure 6. Impact of value chain growth on development outcomes



Source: RIAPA model results.
Note: Panel A shows the percentage point changes in poverty rate that are associated with a 1 percent increase in agricultural GDP; Panel B shows the percentage point changes in hunger rate that are associated with a 1 percent increase in agricultural GDP; Panel C shows the changes in total GDP (in US$ millions) that are associated with a US$1.0 million increase in agricultural GDP from the targeted value chain; Panel D is the change in total economywide employment (in thousand persons) that is associated with a US$1.0 million increase in agricultural GDP from the targeted value chain; and Panel E is the percentage improvement in diet quality that is associated with a 1 percent increase in agricultural GDP. The figure is ordered by the poverty rate outcome.

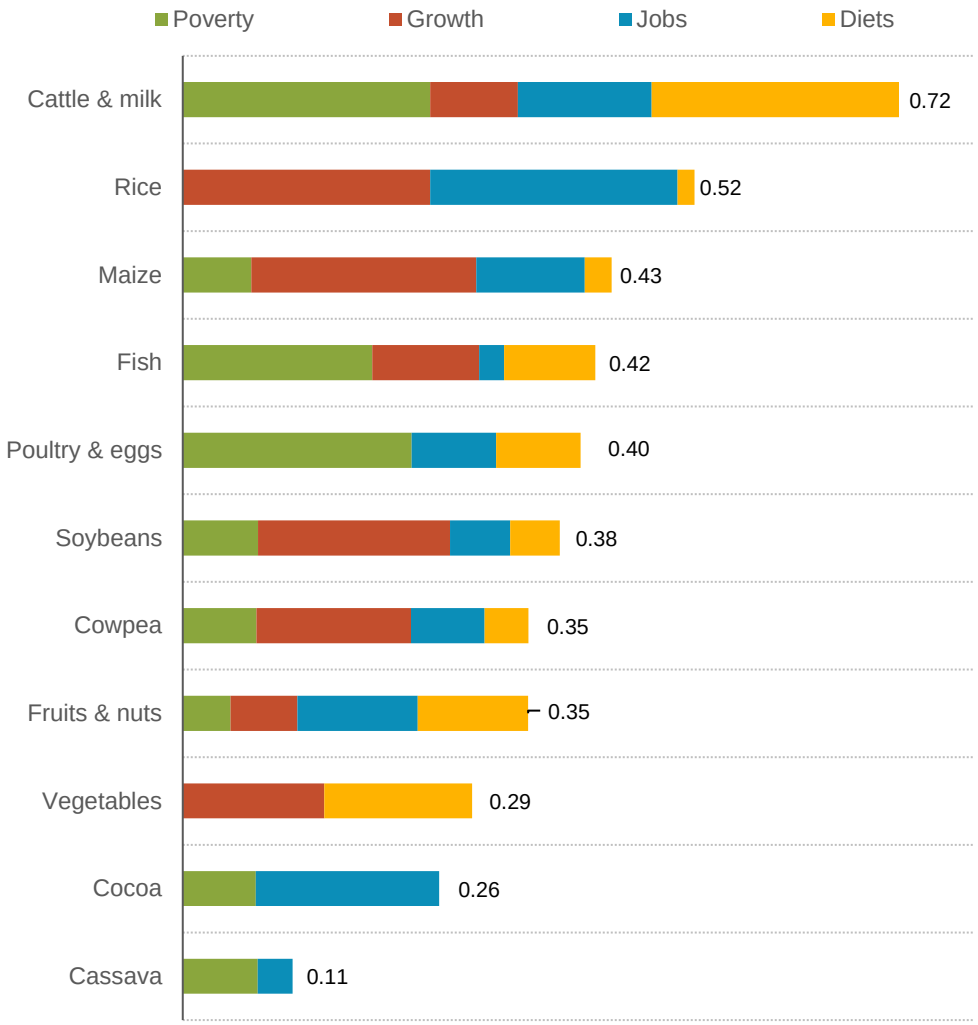
A composite score across different outcome indicators is created to narrow down the number of value chains that might be prioritized. Because of a high correlation between poverty and hunger impacts across value chains, the hunger score is omitted from the composite score. Also, since the different outcome indicators have different underlying units, the individual outcomes are normalized so that they are comparable while still retaining their ranking within the outcome category. Normalization entails assigning a score of 1 to the value chain that is most effective within an outcome category and a score of 0 to the least effective value chain. All value chains with adverse effects on an outcome are also assigned a score of 0. This includes value chains with a growth multiplier of less than one (such as cassava and cocoa) or those without poverty effects (such as vegetables and rice). The remaining value chains receive a score between 1 and 0 that is proportionate to their original score relative to the highest-ranked value chain. The individual normalized scores for the outcomes are then combined into a composite score for each value chain.

The default approach assumes that each of the four outcome indicators is equally important, so an equal weight is assigned to each score; however, if policymakers consider a particular development outcome to be more or less important than the other outcomes, the weights assigned to each particular outcome score can be adjusted accordingly.

Figure 7 presents the composite scores using equal weights across the four development outcome indicators (that is, excluding hunger). Each component in the bars shows the relative contribution of a particular outcome indicator in the final score. The cattle and milk, rice, maize, and fish value chains are ranked highest. For cattle and milk (the highest-ranked value chain), each of the four outcome components makes important contributions to the composite score.

By contrast, in the (second-ranked) rice value chain, there is no contribution from the poverty reduction component, which means rice-led growth would not contribute to reducing poverty. Similarly, productivity growth in the maize value chain would only contribute minimally to diet quality improvement, even though it could have important impacts on the other development outcome areas. While a ranking of their impacts on multiple development outcomes based on composite scores allows us to identify and prioritize value chains, trade-offs clearly exist as to which outcomes are most significantly affected by productivity-led growth in each value chain.

Figure 7. Composite score of development outcomes: Equal weights



Source: RIAPA model results.
Note: Composite scores are a simple average (equally weighted) of the scores for each of the four outcome categories; the figure is ordered according to the highest composite score.

Summary

Nigeria's agrifood GDP experienced modest growth in the recent years, and the agrifood system lacked transformation with little change occurring in its structure. The agricultural share of total employment fell significantly over the 2009 to 2019 period, yet agriculture continues to account for almost half of Nigeria's total employment, and it is still the largest component of the AFS.

Almost all the growth in Nigeria's AFS that occurred between 2009 and 2019 was driven by domestic-market-oriented value chains. The large contribution from the group of less-traded value chains is explained both by its large initial size and above-average growth rate. Nigeria depends heavily on imports for meeting domestic food demand for some value chains, and importable value chains compete not only with imports of primary agricultural products but also with processed agrifood imports.

The RIAPA model-based comparison of future sources growth shows that there is no single value chain group that is the most effective in achieving all desired development outcomes, that is, declining poverty, declining hunger, economic growth, job growth, and improved diets. The cattle and milk value chain, along with the rice, maize, and fish value chains, ranks highly in the combined outcome scores. Most of these value chains already displayed above-average growth rates in the last decade. Promoting these value chains together offers an effective and broad-based way to achieve these development outcomes.

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Appendix

Table A1. Value chain groups and corresponding agricultural subsectors

Value chain groups and their share of AgGDP+	Individual value chains (or agricultural subsectors) in the group and their share of the group's agricultural GDP
Maize (4%)	Maize 100%
Rice (3.6%)	Rice 100%
Other cereals (7.5%)	Sorghum & millet 96.9% | Wheat & barley 0.5% | Other cereals 2.5%
Cowpea (4.4%)	Cowpea 100%
Soybeans (0.8%)	Soybeans 100%
Other oilseeds (9.8%)	Other oilseeds 100%
Root crops (17%)	Cassava 51.9% | Irish potatoes 3.3% | Sweet potatoes 3.7% | Other roots 41.1%
Horticulture (32.2%)	Leafy green vegetables 10.7% | Other vegetables 33.2% | Nuts 2% | Bananas 26.5% | Other fruits 27.7%
Export crops (3.2%)	Coffee 6.8% | Cocoa 53.2% | Cut flowers 38.2%
Other crops (3.6%)	Sugarcane 55.4% | Tobacco 5.8%| Cotton & fibers 34.6% | Rubber 1.6% | Other crops 2.5%
Cattle and milk (3.8%)	Cattle meat 73.5% | Raw milk 26.5%
Livestock (3.9%)	Poultry meat 24.3% | Eggs 19.4% | Small ruminants 41.9% | Other livestock 14.5%
Fish (3.6%)	Aquaculture 26.1% | Capture fisheries 73.9%
Forestry (2.5%)	Forestry 100%

Source: Authors' calculation based the 2019 Social Accounting Matrix for Nigeria (IFPRI 2023b).

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