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Democratic Republic of Congo's Agrifood System

Structure and Drivers of Transformation

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Introduction

Agriculture in the Democratic Republic of Congo (DRC) is dominated by subsistence farming. Households grow food mainly for their own consumption and sell only when they have a surplus. The main crops are cassava, maize, yams, plantains, and rice (FAO 2019). Commercial farming of cash crops such as coffee, palm oil, rubber, and sugar is done on a smaller scale. With constant political instability, infrastructure deficiencies, and lack of investment in DRC, the expansion and productivity of commercial farming have been constrained (World Bank 2020). Livestock and fisheries are also important agrifood subsectors and face constraints similar to the crop subsectors. Despite these challenges, DRC possesses robust agricultural potential due to its vast arable land resources, abundant water resources, and its diverse climatic conditions, which are suitable for a wide variety of crops. There is also potential for further development of the fisheries sector due to the country's extensive river system and large lakes. In this brief, we look beyond primary agriculture to understand the recent performance of DRC's broader agrifood system (AFS) and how it is contributing to growth and transformation in the country.

The AFS is a complex network of actors who are connected by their roles in supplying, consuming, and governing agrifood products and providing 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). During the earliest stages of development, subsistence farming typically dominates agriculture; 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 sector (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

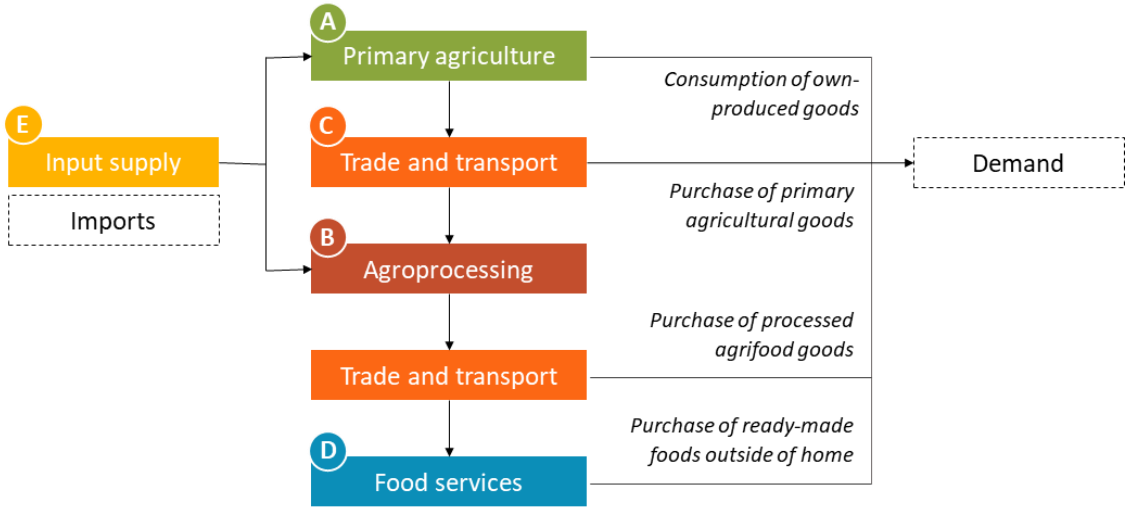
nonfarm consumers creating most of the demand for agricultural outputs via value chains that connect rural areas to towns and cities (Dorosh and Thurlow 2013). The exact nature of this transformation process varies across countries because of the diverse structure of their economies and the unique growth trajectories of their various agrifood and nonfood subsectors.

This brief describes the current and changing structure of DRC's AFS and evaluates the potential contribution of the 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 DRC's AFS with those of other countries at different stages of development. We go on to disaggregate DRC's AFS across agricultural value chains, taking into consideration their respective 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 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 DRC'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 DRC. 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 DRC'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- and off-farm components of the AFS to total AgGDP+ and 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 increased contributions by the 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 value chain to AFS growth and transformation.

Current Structure of Democratic Republic of Congo's Agrifood System

Table 1 presents the structure of DRC's AFS in 2019 based on the 2019 Social Accounting Matrix (SAM) for Democratic Republic of Congo (IFPRI 2023b) compiled from official national accounts data and sectoral employment statistics (NIS-DRC 2020; ILO 2020). National estimates are broken down into estimates for the AFS (that is, AgGDP+ and AgEMP+) and for the rest of the economy. The AFS is further broken down into 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 thus provide a perspective on the relative size of the off-farm AFS components within the overall manufacturing and services sectors.

In 2019, as shown in Table 1, the AFS accounted for 34.6 percent of DRC's national GDP and 74.2 percent of employment. Primary agriculture alone contributed 12.3 percent of GDP[1] but 56.3 percent of employment, while the four off-farm components of the AFS contributed 22.3 percent to GDP and 17.9 percent to employment. Off-farm components of the AFS therefore accounted for roughly 60 percent of AgGDP+ and 24 percent of AgEMP+. A 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.

[1] Because the DRC's agriculture sector is dominated by subsistence farming, when it is compared to the agricultural share of total employment, the value of agricultural GDP seems to be underestimated.

Table 1. Current structure of Democratic Republic of Congo's agrifood system and economy (2019)

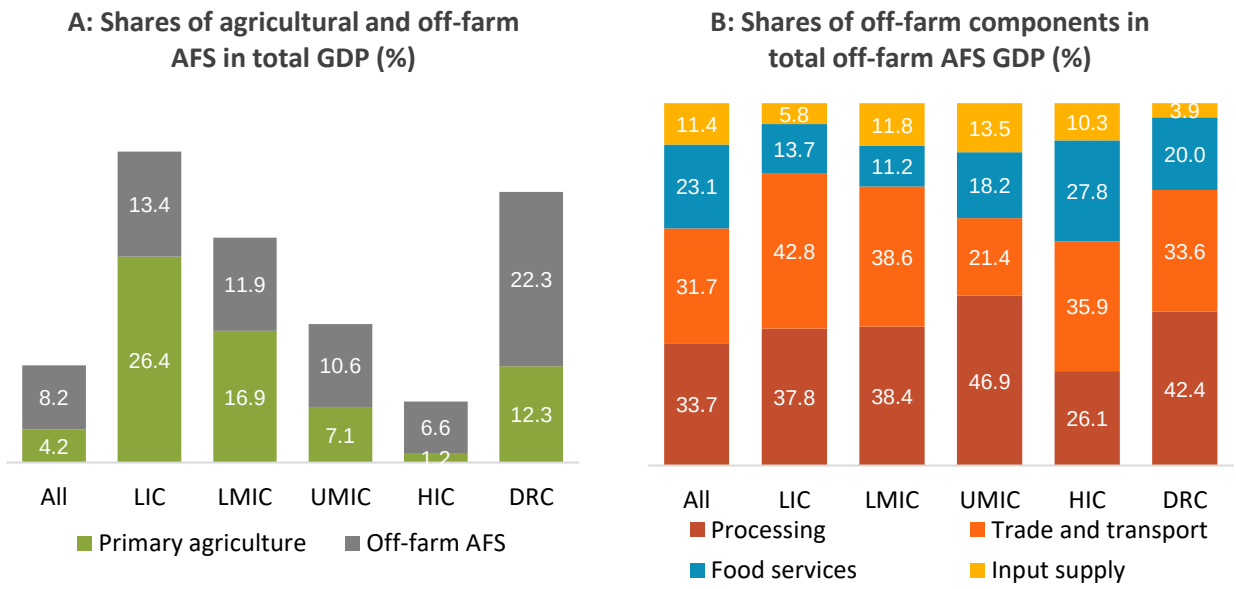
	GDP		Employment	
	Value (US$ billion)	Share (%)	Workers (million)	Share (%)
Total economy	**49.3**	**100**	**30.3**	**100**
Agrifood system (AFS)	**17.1**	**34.6**	**22.5**	**74.2**
Primary agriculture (A)	**6.1**	**12.3**	**17.1**	**56.3**
Off-farm AFS	**11.0**	**22.3**	**5.4**	**17.9**
Processing (B)	4.7	9.5	1.5	5.0
Trade and transport (C)	3.7	7.5	3.6	11.9
Food services (D)	2.2	4.5	0.2	0.8
Input supply (E)	0.4	0.9	0.1	0.2
Rest of economy	**32.2**	**65.4**	**7.8**	**25.8**
Total manufacturing	5.7	11.6	1.9	6.2
Total services	22.3	45.2	10.3	34.1
Total trade and transport	10.8	22.0	8.6	28.2

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

Comparing Democratic Republic of Congo'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 (HIC) countries. DRC is an LIC. However, the on-farm component of DRC's AFS and its contribution to national GDP are much lower than those of its LIC peers, while the off-farm component accounts for a larger share of total GDP than in its peer countries (Panel A). Within the four off-farm components of the AFS, DRC's agroprocessing is larger than the average in other LICs, while the agrifood trade and transport component is relatively small (Panel B).

Figure 2. Comparing Democratic Republic of Congo's agrifood system to other countries (2019)

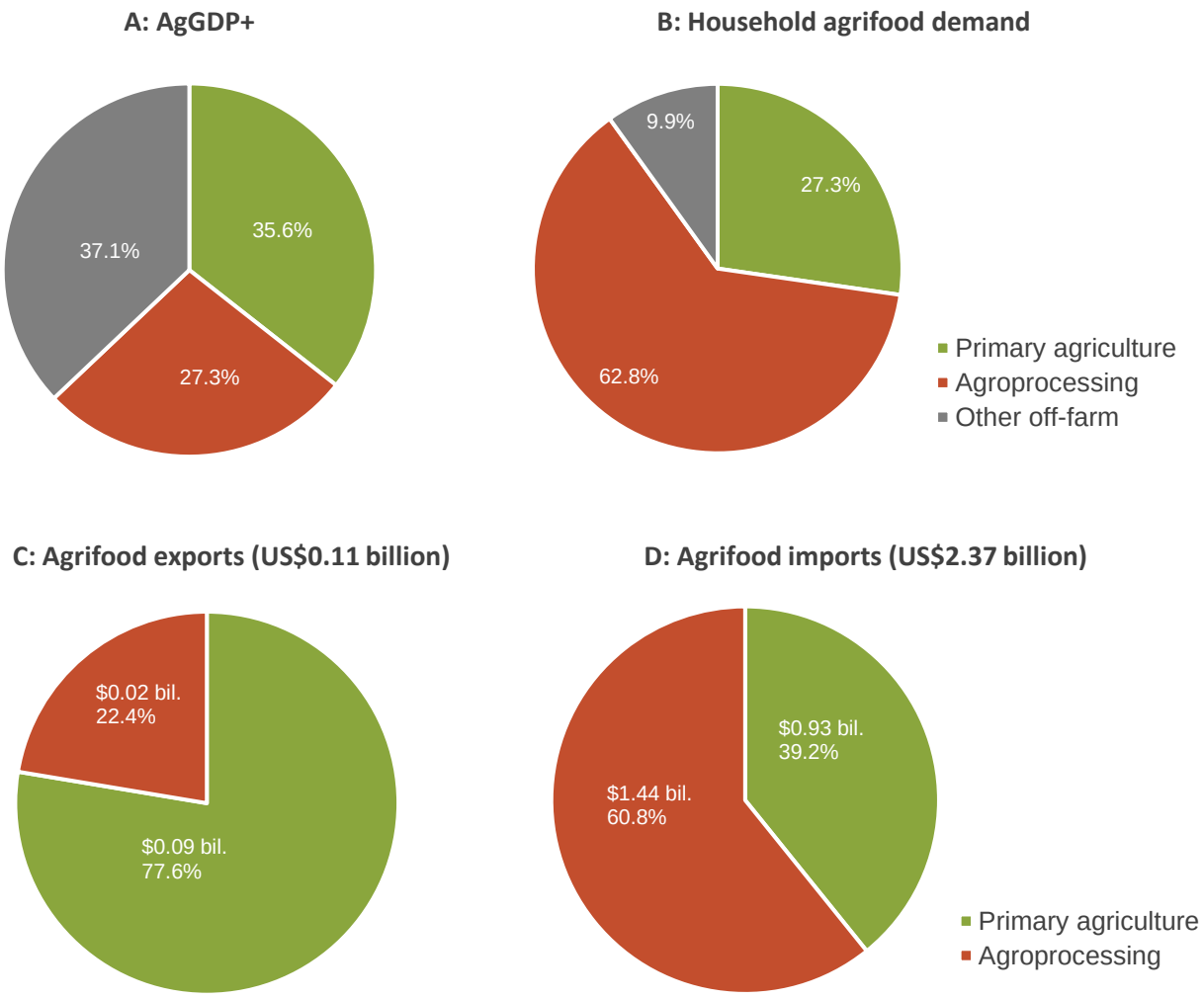


Source: IFPRI's Agrifood System Database (Thurlow et al. 2023) and the 2019 Social Accounting Matrix for the Democratic Republic of Congo (IFPRI 2023b).
Note: LIC = low-income country; LMIC = lower-middle-income country; UMIC = upper-middle-income country; HIC = high-income country.

Unpacking the Demand Side of Democratic Republic of Congo's Agrifood System

In Figure 3, the structure of DRC'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 35.6 percent of AgGDP+ is from primary agriculture, primary agricultural commodities account for only 27.3 percent of household demand. In contrast, household demand for processed agrifood products accounts for 62.8 percent of total agrifood demand, even though the associated sector accounts for only 27.3 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, 77.6 percent of agrifood commodity exports are primary agricultural commodities (Panel C), but 60.8 percent of imports are processed goods (Panel D). DRC runs a substantial deficit on its agrifood commodity trade balance for both primary agricultural and processed agrifood commodities—the value of DRC's agrifood commodity imports is more than 20 times the value of its agrifood exports.

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



Source: Authors' calculation based on the 2019 Social Accounting Matrix for Democratic Republic of Congo (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 DRC's agrifood system into 12 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 12 value chain groups are further categorized into three subgroups on the basis of 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 12 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 off-farm components of the AFS. Consistent with Figure 3, Table 2 shows

that DRC has a large agrifood trade imbalance, with its import–consumption ratio of 8.8 percent far exceeding its export–output ratio of 0.4 percent. Two value chains, cocoa and coffee along with forestry, are classified as exportable with export–output ratios exceeding the national average for AFS value chains. Because the national average export–output ratio is extremely low (0.4 percent), however, only cocoa and coffee are a real exportable value chain. Almost all cocoa and coffee are produced for export as primary products and the exportable sectors thus have a disproportionately small off-farm AFS GDP share of 3.0 percent, which is much lower than their primary agricultural GDP share of 9.6 percent.

Table 2. Democratic Republic of Congo'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	**100.0**	**100.0**	**100.0**	0.4	8.8
Exportable	**5.3**	**9.6**	**3.0**	**8.5**	**3.6**
Cocoa and coffee	0.3	0.5	0.1	100.0	
Forestry	5.1	9.0	2.9	4.5	3.6
Importable	**60.7**	**26.7**	**79.6**	**0.0**	**11.5**
Maize	15.7	10.7	18.5		13.0
Rice	7.1	8.7	6.2		10.0
Other crops	7.5	0.5	11.3		12.0
Livestock	25.8	3.0	38.3		8.2
Fish	4.7	3.8	5.2	0.0	18.0
Less traded	**32.2**	**63.8**	**14.8**	**0.1**	**2.1**
Pulses	1.5	3.8	0.3		2.2
Oilseed	8.0	6.2	9.0	0.2	5.2
Cassava	9.4	22.8	2.0		0.1
Other roots	9.9	23.1	2.7		0.0
Horticulture	3.4	7.9	1.0		3.1

Source: Authors' calculation based on the 2019 Social Accounting Matrix for Democratic Republic of Congo (IFPRI 2023b).

Of the 12 value chains, 5 fall into the importable group of value chains, with import–consumption ratios higher than the AFS average, while 5 are in the less-traded group. Importable value chains dominate the AFS GDP and together account for 60.7 percent of AgGDP+, while the less-traded value chains account for 32.2 percent. Many of the importable value chains have relatively large off-farm components and together they contribute a large share to off-farm AFS GDP (76.9 percent) compared to their primary agricultural GDP contribution (26.7 percent). On the other hand, most less-traded value chains have relatively small off-farm components, and these value chains contribute a small share to off-farm AFS GDP (14.8 percent) compared to their primary agricultural GDP contribution (63.8 percent). The oilseeds value chain is a clear exception, and it is associated with significant value addition off-farm (oil processing). Expansion of this sector, together with the expansion of a few importable value chains,

could thus effectively drive agricultural transformation by boosting overall value addition and off-farm employment.

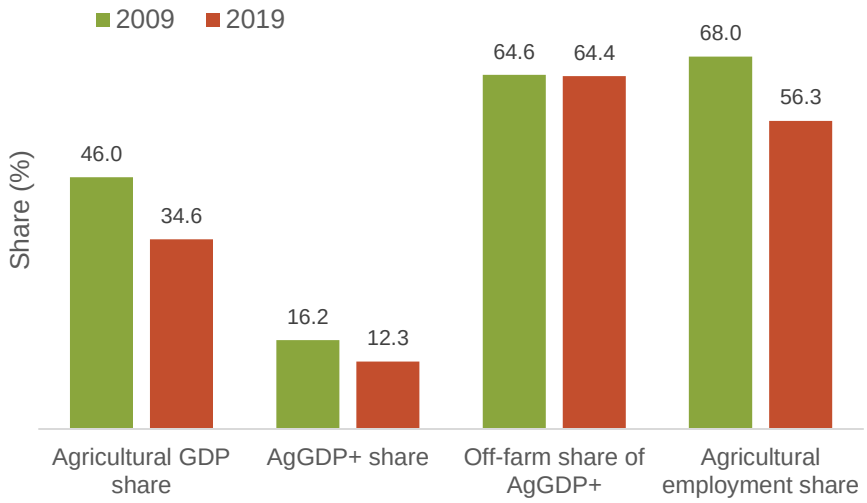
Structural Change and Drivers of Agrifood System GDP Growth

The previous sections have provided a snapshot of the current structure of DRC's AFS, the disaggregation of the AFS across the 12 value chain groups, and the trade orientation of those value chains. We have demonstrated that DRC has a large agrifood trade deficit and that importable value chains dominate the AgGDP+ while less-traded value chains are dominant in terms of their contribution to primary agriculture. Most importable value chains, together with oilseeds (a less-traded value chain), are generally more oriented toward value addition in the off-farm components of the AFS; that is to say, their contribution to off-farm AFS components is larger than their contribution to primary agriculture. Prioritizing growth in oilseeds and in some importable value chains could therefore be an effective strategy for expanding off-farm value addition and jobs, which would contribute positively to AFS transformation.

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

Figure 4 compares the shares of agricultural GDP and AgGDP+ in DRC's national GDP and shows agricultural employment as a share of total employment. It also includes an estimate of the share of the off-farm components in AgGDP+. The figure covers the period between 2009 and 2019. The agricultural share of total GDP was relatively low in DRC and fell over this period. The share of AgGDP+ in total GDP was higher in 2009 (46.0 percent), but by 2019 it had fallen by more than 10 percentage points (to 34.6 percent). Because the decline in the share of AgGDP+ in total GDP was more than the decline in the share of primary agricultural GDP in total GDP, the off-farm share of AgGDP+ changed little between 2009 and 2019, remaining about 64 percent. The agricultural employment share fell more significantly, from 68.0 percent in 2009 to 56.3 percent in 2019, indicating an improvement in agricultural labor productivity over time. However, with much smaller shares in total GDP (16.2 percent in 2009 and 12.3 percent in 2019) and larger shares in total employment (68.0 and 56.3 percent in those same two years), agricultural productivity continues to be extremely low in DRC and the structure of the AFS has also barely changed. This lack of structural change within DRC's AFS could further deter farmers from adopting productivity-enhancing technologies and may explain why primary agriculture remains such a large sector in terms of its employment share.

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



Source: Authors' estimates using the 2009 and 2019 Social Accounting Matrixes for Democratic Republic of Congo (IFPRI 2023b).

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	3.2	3.2	3.1	3.2
Exportable	1.1	3.3	−1.9	5.0
Cocoa and coffee	−7.6	−3.4	−13.8	
Forestry	1.9	3.9	-0.8	5.0
Importable	3.4	2.8	3.5	3.0
Maize	2.0	2.2	1.9	2.5
Rice	2.6	6.0	0.6	0.3
Other crops	2.4	-0.7	2.5	3.6
Livestock*	5.7	2.0	5.9	3.5
Fish	0.5	0.0	0.7	6.8
Less traded	2.9	3.4	1.8	4.1
Pulses	0.3	1.3	−4.8	
Oilseeds	2.2	0.8	2.8	4.1
Cassava	0.9	2.0	-3.9	
Other roots*	10.5	10.9	9.1	
Horticulture	-1.7	-1.8	-1.6	

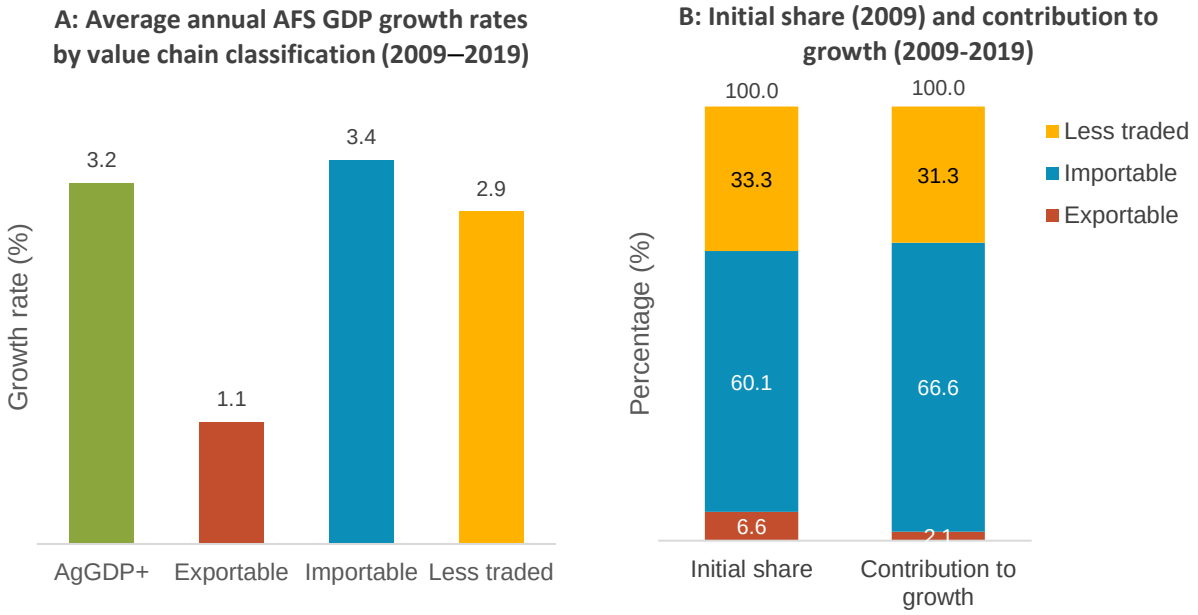
Source: Authors' analysis using the 2009 and 2019 Social Accounting Matrixes for Democratic Republic of Congo (IFPRI 2023b).
Note: Value chains that experienced above-average AgGDP+ growth over the 2009 to 2019 period (that is, higher than 3.2 percent) are marked with an asterisk (*).

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, DRC's AFS showed poor growth, with an average annual AgGDP+ growth rate of 3.2 percent, which is close to its population growth rate. The on- and off-farm components of the AFS showed similarly low growth rates (3.1 and 3.2 percent, respectively).

Among the 12 value chains, only 2 of them—livestock and other roots—achieved above-average growth during the 2009 to 2019 period, that is, more than 3.2 percent per year (marked with an asterisk in Table 3). Growth rates were negative or close to zero for 5 of the 12 value chains. The cocoa and coffee value chain had the worst growth performance, its AFS GDP falling annually by 7.8 percent in that 10-year period. DRC's major staple crops—maize, rice, oilseeds, and cassava—all had growth rates below the population growth rate; food security thus presents a serious challenge for many poor households in the country.

Figure 5 summarizes the key growth trends from Table 3. On average, less-traded (2.9 percent) and exportable (1.1 percent) value chains grew more slowly than national AgGDP+ (3.2 percent), and importable value chains grew slightly faster than the national average (3.4 percent) (Panel A). Since importable value chains make up a large share of the AFS (60.1 percent) and have a higher growth rate, the larger group of importable value chains contributed the most to growth, at 66.6 percent; this was followed by the less-traded group, at 31.3 percent (Panel B).

Figure 5. Drivers of Democratic Republic of Congo's AFS GDP growth (2009–2019)



Source: Authors' analysis using the 2009 and 2019 Social Accounting Matrixes for Democratic Republic of Congo (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, and economic shocks. Here we employ RIAPA to assess the effectiveness of productivity-led growth in DRC's agricultural value chain groups for promoting multiple development outcomes. The analysis was carried out for 9 value chain groups, which were selected from the original list of 12; cocoa and coffee, 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 in 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 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 horticultural product value chain, for example, has strong poverty effects and is most effective at improving diet quality, but it is much less effective in increasing GDP growth or jobs. In fact, productivity growth in the horticultural sector attracts resources away from other value chains, ultimately causing the improvement in total GDP to be less than the increase in the GDP of horticulture; that is, the growth multiplier is less than one. The rice value chain, in contrast, has a growth multiplier of 3.76, which is the highest of all the value chains. This means that for every US$1.00 increase in GDP in the rice value chain that is driven by rising productivity, an additional US$3.76 is generated in total GDP; that is, US$2.76 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 high on the hunger outcome, but it ranks much lower on the diet

outcome. It even has some negative employment effects; that is, growth in added value in the rice value chain is accompanied by some job loss.

These results highlight the possible trade-offs that may emerge when prioritizing individual value chains, as no single value chain 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.

A composite score across the different outcome indicators is created in order 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 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 1 (horticultural products and other root crops) or those with negative employment effects (such as livestock, rice, and fish). 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 outcome score can be adjusted accordingly.

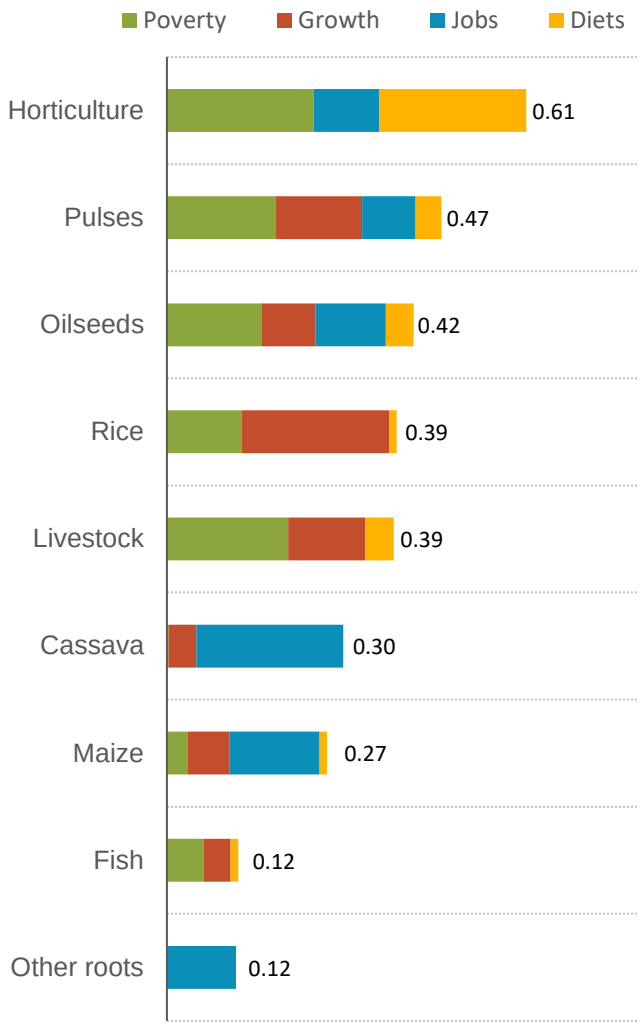
Figure 7 presents the composite scores using equal weights across the four development outcome indicators (that is, excluding hunger). Each component in the bars shows the relative contribution of that particular outcome indicator to the final score. The horticultural products value chain is ranked highest, followed closely by pulses and oilseeds. The growth component of the horticultural sector, however, does not contribute to the increase in GDP; this means that horticulture-led growth would not contribute positively to national GDP beyond its own growth. For the pulses and oilseeds value chains, productivity growth has important impacts on poverty, growth, and jobs, but it would only contribute minimally to improvement in diet quality.

While a ranking of their impacts on multiple development outcomes on the basis of 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. The recent rise in wheat prices in the world market resulting from the Russia-Ukraine war has led the country to explore the possible substitution of cassava flour for wheat flour for making bread. If successful, this will boost the demand for cassava and will create more nonfarm value addition and jobs along the cassava value chain, as well as conserving foreign exchange reserves.

Figure 6. Impact of value chain growth on development outcomes

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

Figure 7. Composite score of development outcomes: Equal weights



Source: RIAPA model results.
Note: The composite score is 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

The Democratic Republic of Congo showed poor growth in both primary agriculture and its total agri-food system (AFS) in the decade leading up to the COVID-19 pandemic. The 3.2 percent annual growth in the country's AgGDP+ over the 2009 to 2019 period was close to the growth in its population. Stagnant growth also led to a lack of structural change within DRC's AFS. Growth rates for the on- and off-farm components of the AFS were similarly low, at 3.2 and 3.1 percent, respectively, and the off-farm share of the AFS changed little in that decade. Growth in the DRC's many staple crops—maize, rice, pulses, oilseeds, and cassava—was either negative or close to zero, that is, below population growth. Without growth in the AFS, food security presents a serious challenge to many of DRC's poor households.

The RIAPA model-based comparison of future sources of growth shows that there is no single value chain group that is the most effective in achieving all the desired development outcomes, that is declining poverty, declining hunger, economic growth, job growth, and improved diets. The horticulture, pulses, and oilseed value chains rank highly in their composite outcome scores. Of these, horticulture is ranked highest; however, even though it has the highest impact on poverty, jobs, and diets, it is not able to contribute to economywide growth. Pulses and oilseeds, the other two high-ranking value chains, have only minimal impact on diets, though their impact on other development outcomes could be substantial. Promoting these value chains together thus offers an effective and broad-based way to achieve these development outcomes.

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Appendix

Table A1. Value chain groups and their 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 (15.7%)	Maize 100%
Rice (7.1%)	Rice 100%
Pulses (1.5%)	Pulses 100%
Oilseeds (8.0%)	Groundnuts 42.6% | Other oilseed 57.4%
Cassava (9.4%)	Cassava 100%
Other roots (9.9%)	Irish potatoes 11% | Sweet potatoes 10.7% | Other roots 5.4% | Plantains 72.8%
Horticulture (3.4%)	Other vegetables 22.3% | Bananas 30.1% | Other fruits 47.6%
Cocoa and coffee (0.3%)	Cocoa 66% | Coffee 34%
Other crops (7.5%)	Sorghum and millet 59.1% | Sugarcane 40.9%
Livestock (25.8%)	Cattle meat 25.5% | Raw milk 7.6% | Poultry meat 8.9% | Eggs 7.1% | Small ruminants 15.5% | Other livestock 35.5%
Fish (4.7%)	Capture fisheries 100%
Forestry (5.1%)	Forestry 100%

Source: Authors' calculation based on the 2019 Social Accounting Matrix for Democratic Republic of Congo (IFPRI 2023b).

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