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Madagascar's Agrifood System

Structure and Drivers of Transformation

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Introduction

Madagascar's economy showed little progress during the decade from 2009 to 2019, growing at an average rate of just 2.9 percent per year, which is only marginally higher than the population growth rate of 2.7 percent (World Bank 2023). The global COVID-19 pandemic pushed the economy into negative growth in 2020, while drought, flooding, and storm damages in 2021 and 2022 had further adverse impacts on the economy. Current projections suggest the economy will achieve growth of 4.2 percent in 2023 and 4.6 percent in 2024, which are well above pre-pandemic growth rates (World Bank 2023). Agriculture is a relatively important sector in Madagascar, accounting for nearly 30 percent of GDP and more than 60 percent of employment. The poor performance of the agriculture sector in the 2009 to 2019 period—the sector grew at only 0.5 percent per year—was an important reason for weak growth overall (INSTAT 2020). 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 the economy of Madagascar.

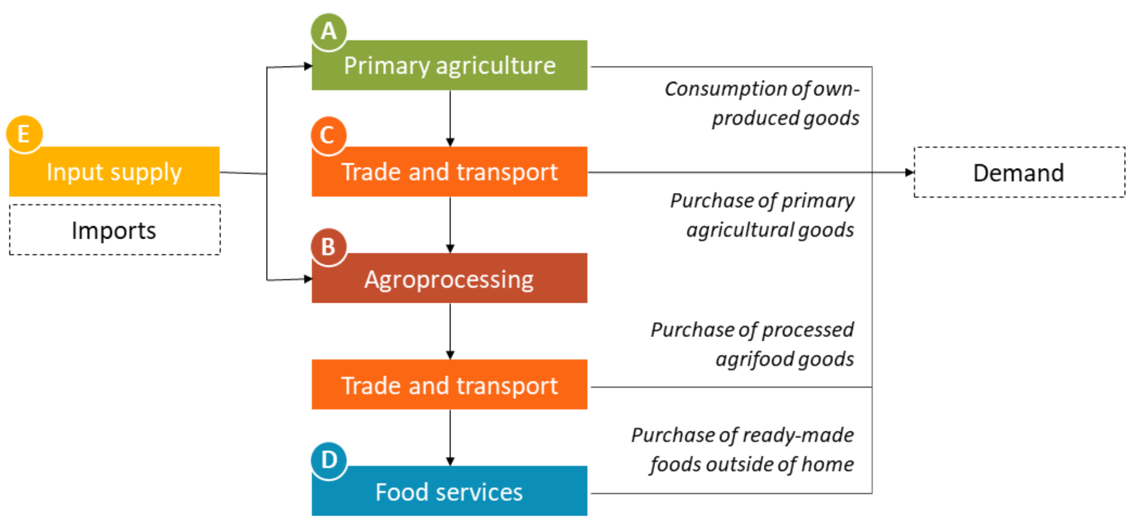
The AFS is a complex network of actors who are connected by their roles in supplying, consuming, and governing agrifood products and jobs. Just as an economy undergoes transformations as a country develops, agrifood systems are also expected to evolve (Diao, Hazell, and Thurlow 2010; Timmer 1988). Subsistence 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 Madagascar'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 Madagascar's AFS with that of other countries at different stages of development. We go on to disaggregate Madagascar'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 Madagascar'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 Madagascar. 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 Madagascar'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 Madagascar's Agrifood System

Table 1 presents the structure of Madagascar's AFS in 2019 based on official national accounts data and sectoral employment statistics (INSTAT 2020; ILO 2020), as compiled in a 2019 Social Accounting Matrix (SAM) for Madagascar (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.

As shown in Table 1, in 2019 the AFS accounted for 44.3 percent of Madagascar's national GDP and 74.0 percent of employment. Primary agriculture alone contributed one-quarter of GDP and two-thirds of employment, while the four off-farm components of the AFS contributed 17.6 percent to GDP and 9.9 percent to employment. The off-farm components of the AFS, therefore, accounted for roughly 40 percent of AgGDP+ and 13 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.

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

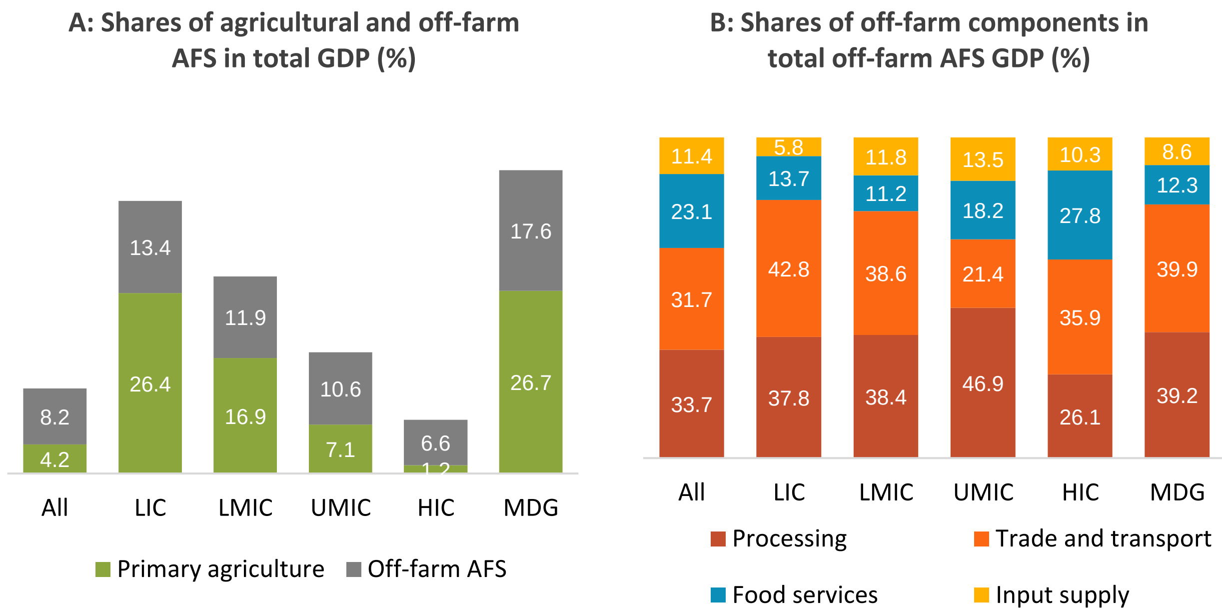
	GDP		Employment	
	Value (US$ billion)	Share (%)	Workers (million)	Share (%)
Total economy	**13.6**	**100.0**	**13.6**	**100.0**
Agrifood system	**6.0**	**44.3**	**10.1**	**74.0**
Primary agriculture (A)	**3.6**	**26.7**	**8.7**	**64.1**
Off-farm AFS	**2.4**	**17.6**	**1.3**	**9.9**
Processing (B)	0.9	6.9	0.5	3.3
Trade and transport (C)	1.0	7.0	0.7	5.2
Food services (D)	0.3	2.2	0.1	0.8
Input supply (E)	0.2	1.5	0.1	0.5
Rest of economy	**7.6**	**55.7**	**3.5**	**26.0**
Total manufacturing	1.4	10.5	0.8	5.9
Total services	6.8	50.0	3.7	27.2
Total trade and transport	2.7	19.9	1.6	11.7

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

Comparing Madagascar'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 AFS structures of low-income (LIC), lower-middle-income (LMIC), upper-middle-income (UMIC), and high-income countries (HIC) in 2019. As an LIC, both the on- and off-farm composition of Madagascar's AFS and its contribution to national GDP are comparable to that of its peer countries (Panel A). Within the off-farm components of the AFS, Madagascar's four off-farm components are also similar as seen in other LICs (Panel B).

Figure 2. Comparing Madagascar’s agrifood system to other countries (2019)

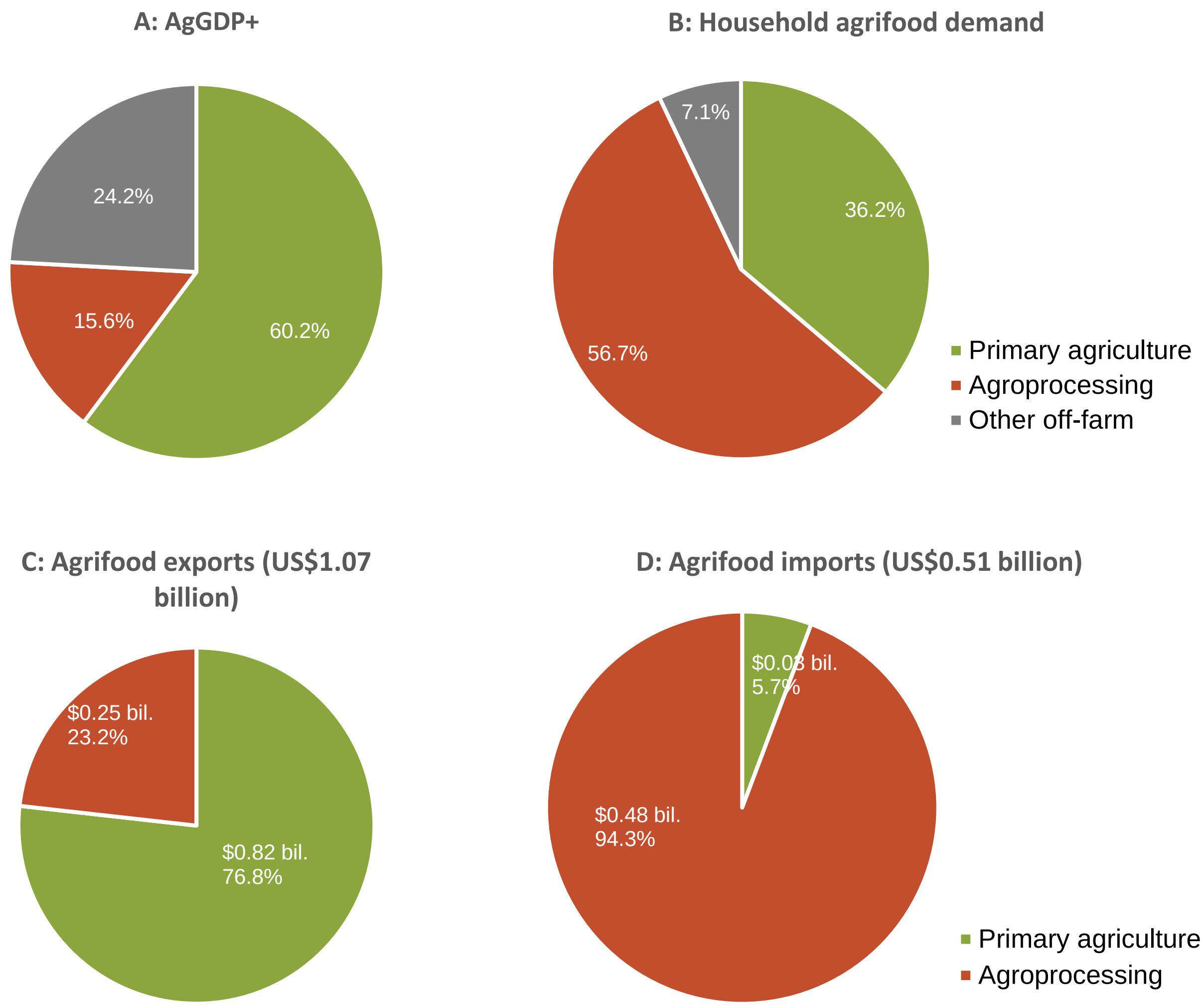


Source: IFPRI’s Agrifood System Database (Thurlow et al. 2023) and the 2019 Social Accounting Matrix for Madagascar (IFPRI 2023b).
Note: LIC = low-income country; LMIC = lower-middle-income country; UMIC = upper-middle-income country; and HIC = high-income country.

Unpacking the Demand Side of Madagascar’s Agrifood System

In Figure 3, the structure of Madagascar’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 60.2 percent of AgGDP+ is from primary agriculture, primary agricultural commodities account for only 36.2 percent of household demand. In contrast, household demand for processed agrifood products accounts for 56.7 percent of total agrifood demand, even though the associated sector accounts for only 15.6 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, 76.8 percent of agrifood commodity exports are primary agricultural commodities (Panel C), but 94.3 percent of imports are processed goods (Panel D). Madagascar maintains a surplus on its total agrifood commodity trade balance driven by a substantial trade surplus in primary agricultural products—the value of Madagascar’s primary agricultural exports is near 30 times the value of its imports.

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



Source: Authors' calculation based on the 2019 Social Accounting Matrix for Madagascar (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 Madagascar'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 Madagascar has a comparative advantage in exports, with an export–output ratio of 10.3 percent;

this is much higher than the import–consumption ratio of 5.4 percent. Of the 12 value chains, 5 are classified as exportable value chains because their export–output ratios exceed the national average for AFS value chains. The "export crops" value chain groups together Madagascar's important traditional export crops including cotton, nuts, cocoa, and coffee. Agrifood exports are mainly primary agricultural products; these sectors thus have a small off-farm AFS GDP share of 32.0 percent, lower than their primary agricultural GDP share of 41.3 percent.

Table 2. Madagascar'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**	10.3	5.4
Exportable	**37.6**	**41.3**	**32.0**	**37.5**	**2.3**
Pulses	1.2	1.6	0.5	46.2	2.5
Horticulture	12.4	16.1	6.9	21.8	0.9
Export crops	5.0	5.7	4.0	34.5	2.0
Fish	11.5	12.2	10.5	40.1	3.7
Forestry	7.5	5.8	10.1	27.8	2.8
Importable	**19.8**	**13.4**	**29.4**	**3.4**	**15.5**
Maize and other cereals	1.0	0.9	1.1	1.7	34.5
Oilseeds	4.1	1.7	7.7	13.7	22.2
Cattle and dairy	14.7	10.7	20.6	0.2	10.3
Less tradable	**41.9**	**45.3**	**36.7**	**1.0**	**3.4**
Rice	25.7	26.0	25.3	0.2	3.9
Root crops	5.1	6.9	2.3	1.2	2.5
Other crops	4.5	3.3	6.4	5.9	
Other livestock	6.6	9.2	2.7	1.0	0.7

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

Four of the 12 value chains fall in the less-traded group of value chains, together accounting for 41.9 percent of AgGDP+. Many of these less-traded value chains have relatively small off-farm components, and hence these value chains contribute a relatively small share to off-farm AFS GDP (36.7 percent) compared to their primary agricultural GDP contribution (45.3 percent). Three value chains fall into the importable category, including the cattle and dairy value chain, which is the largest importable value chain. This value chain, as well as the oilseed value chain, are also associated with significant value addition off-farm (such as meat processing and dairy products for the cattle and dairy value chain and oil processing for the oilseed value chain). Expansion of these sectors could be effective at driving agricultural transformation by boosting value addition and off-farm employment in the value chain.

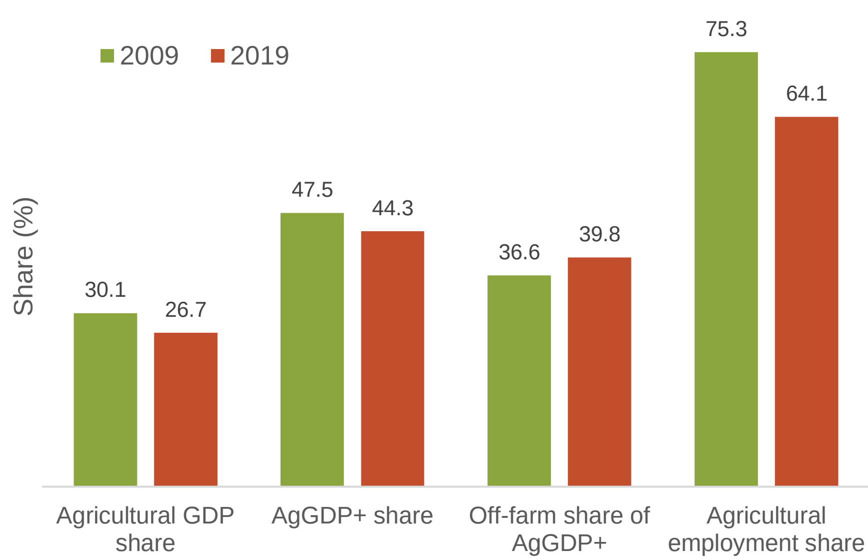
Structural Change and Drivers of Agrifood System GDP Growth

The previous sections have provided a snapshot of the current structure of Madagascar'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 Madagascar has some comparative advantage in agrifood exports, while less-traded value chains are dominant in terms of their contribution to AgGDP+ and primary agriculture. These value chains are also generally less oriented toward value addition in the off-farm components of the AFS (that is to say, their contribution to off-farm AFS components is small relative to their contribution to primary agriculture, especially compared to some tradable value chains). Prioritizing growth in some tradable value chains like cattle and dairy and oilseeds, two 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 Madagascar's AFS in recent years. Labor productivity is typically lowest in primary agriculture, and higher in off-farm activities, such as in agrifood processing and food services, and in sectors outside of the AFS. Economic growth and urbanization are associated with relatively 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 who obtain off-farm employment may benefit from structural transformation.

Figure 4 compares the shares of agricultural GDP and AgGDP+ in Madagascar's national GDP and 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+. With the slow growth in Madagascar's AFS GDP, agricultural GDP and AgGDP+ shares as well as the agricultural employment share fell modestly between 2009 and 2019, while the off-farm component of AgGDP+ increased marginally. This lack of significant structural change within Madagascar's AFS could deter farmers from adopting productivity-enhancing technologies and may explain why primary agriculture remains such a large sector in terms of its GDP and employment shares.

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



Source: Authors' estimates using the 2009 and 2019 Social Accounting Matrixes for Madagascar (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, Madagascar's AFS lacked growth; annual AgGDP+ growth averaged 1.0 percent, well below the population growth rate of 2.7 percent in the same period. On-farm growth was stagnant (0.5 percent), and the off-farm component of AFS also grew slowly (1.8 percent).

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

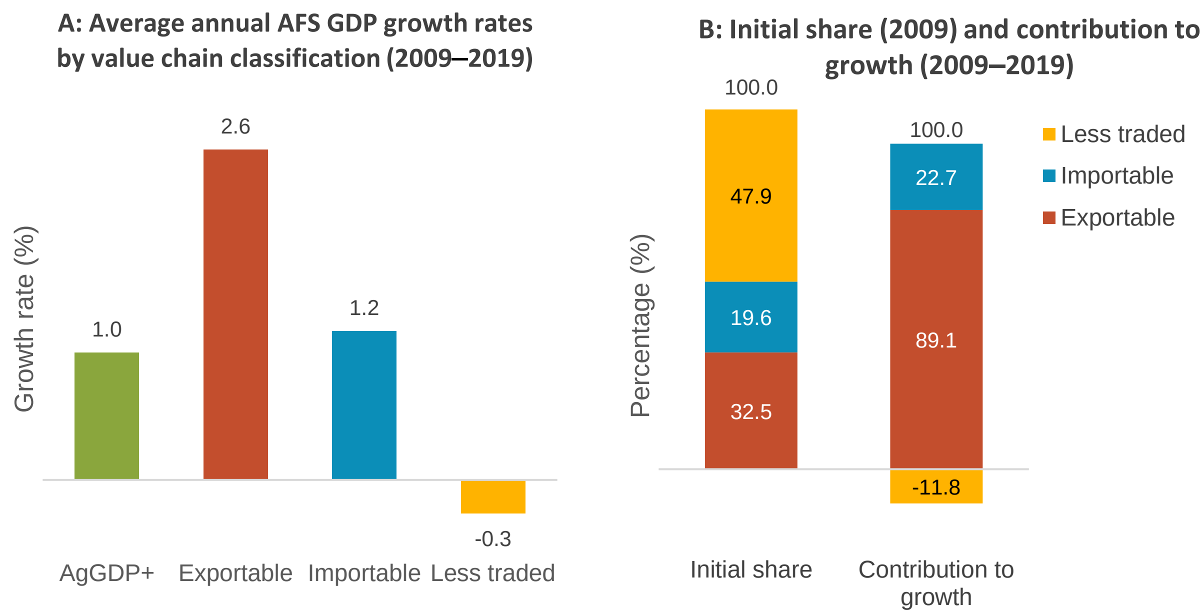
	Average annual GDP growth rate (%)			
	Total AFS	Primary agriculture	Off-farm AFS	Agro-processing
Total AFS	**1.0**	**0.5**	**1.8**	**2.1**
Exportable	**4.5**	**5.0**	**3.9**	**7.6**
Pulses*	4.0	3.9	4.9	
Horticulture	2.1	2.4	1.3	5.6
Export crops*	2.8	2.7	3.1	5.3
Fish*	3.9	3.0	5.8	5.0
Forestry	1.0	−0.1	2.2	2.8
Importable	**6.9**	**6.4**	**7.2**	**8.7**
Maize and other cereals	−1.4	−3.6	2.6	4.7
Oilseeds*	6.7	10.1	5.8	5.7
Cattle and dairy	0.2	−2.4	3.1	5.1
Less traded	**5.5**	**5.0**	**6.4**	**7.4**
Rice	−0.4	−0.7	0.1	−0.7
Root crops	1.1	1.2	0.7	5.5
Other crops	−1.5	−0.4	−2.3	−3.8
Other livestock	0.3	0.0	2.3	5.8

Source: Authors' analysis using the 2009 and the 2019 Social Accounting Matrixes for Madagascar (IFPRI 2023b).
Note: Value chains that experienced above population growth over the 2009–2019 period (that is, higher than 2.7 percent) are marked with an asterisk (*).

Among the 12 value chains, only 4 achieved growth rates above the population growth rate during the 2009 to 2019 period, that is, more than 2.7 percent per year (these are marked with an asterisk in Table 3). Among the 4 exportable value chains, 3 of them—pulses, export crops, and fish—grew faster than the population. One of the 3 importable value chains (oilseeds) also achieved above-population growth, but none of the 4 less-traded value chains—rice, root crops, other crops, and other livestock—had growth rates above the population growth rate; in fact, the growth rate for rice and other crops was negative and close to zero for other livestock. Thus, Madagascar faces a serious food security challenge from the lack of growth in staple food crops and livestock.

Figure 5 summarizes the key growth trends from Table 3. On average, growth in the group of less-traded value chains was negative (−0.3 percent), and only exportable value chains achieved a growth rate (2.6 percent) close to the population growth of 2.7 percent (Panel A). While the group of less-traded value chains initially had a large initial share in AFS GDP, its negative growth meant it was unable to contribute to AFS growth, which kept the overall AFS growth rate extremely low (1.0 percent) (Panel B).

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



Source: Authors' analysis using the 2009 and the 2019 Social Accounting Matrixes for Madagascar (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 different agricultural value chain groups in Madagascar to promote multiple development outcomes. The analysis was carried out for 9 value chain groups, which were selected from the original list of 12; other cereals, pulses, 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.

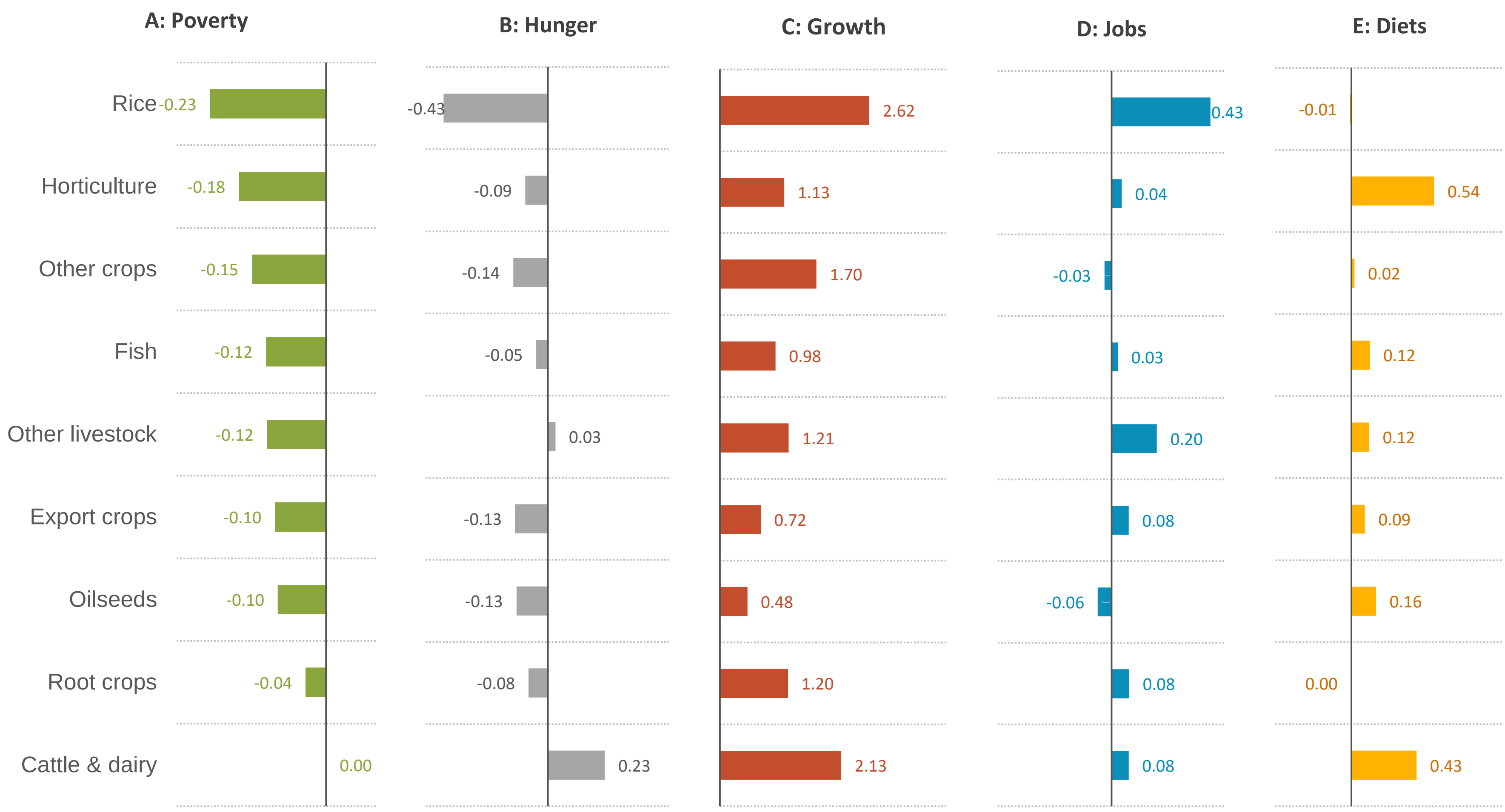
The simulations entail increasing on-farm productivity separately in each targeted value chain and comparing development outcomes across the value chains. While this exogenous productivity shock is imposed only in the primary agriculture component of each value chain, there are spillover effects into 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 rice value chain, for example, has strong poverty effects and is most effective at reducing hunger, but it is much less effective in improving diet quality. In fact, productivity growth in the rice sector has a negative impact on diet quality. Rice is widely consumed in Madagascar. With higher productivity, rice prices fall, causing many households to consume more rice and reduce consumption of other healthy food items. In contrast, the fish value chain has a strong positive impact on diet quality, but it does not help broader growth. In fact, productivity growth in fish attracts resources away from other value chains, ultimately causing growth in total GDP to be less than the increase in GDP from the fish value chain.

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

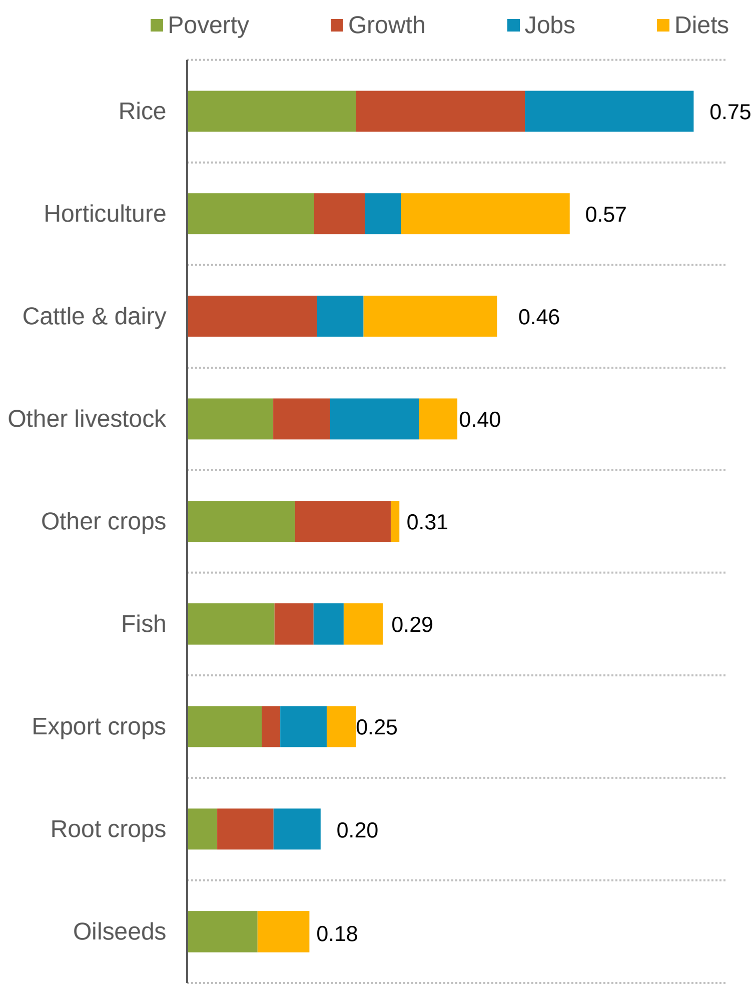
A composite score across different outcome indicators is created to narrow down the number of value chains that might be prioritized. Because of a high correlation between poverty and hunger impacts across value chains, the hunger score is omitted from the composite score. Also, since the different outcome 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 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 (oilseeds, export crops, and fish) or those with negative employment effects (oilseeds and other crops). 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 rice, horticulture, cattle and dairy, and other livestock value chains are ranked highest. For rice (the highest-ranked value chain) productivity growth would not contribute to diet quality improvement, even though it could have important impacts on the other three development outcome areas.

By contrast, in the second-ranked horticulture value chain, there are some contributions from all the four outcome components, though the impacts on growth and jobs are modest. Similarly, productivity growth in the cattle and dairy value chain would not contribute to poverty reduction, even though it could have important impacts on the other development outcome areas. 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.

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

Madagascar's economy showed little progress during the 2010s, and the 2.9 percent annual growth rate is only marginally higher than the population growth rate of 2.7 percent. The agrifood system (AFS) performed poorly, and growth in primary agriculture was stagnant. Since about three-quarters of the labor force in Madagascar is engaged in the AFS, the lack of growth negatively affected household income growth and poverty reduction. Without growth in many food crops and livestock products, Madagascar also faces serious food security challenges.

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 desired development outcomes, that is, declining poverty, declining hunger, economic growth, job growth, and improved diets. The two livestock value chains alongside the rice and horticulture value chains rank highly in their composite outcome scores for poverty, GDP, jobs, and diets. However, not all these high-ranking value chains could contribute to

all the development outcome areas; and moreover, all these value chains performed poorly in the preceding decade. While promoting these value chains together offers an effective and broad-based way to achieve these development outcomes, achieving their growth is a challenging task for the country.

About the Authors

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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
Rice (25.7%)	Rice 100%
Maize and other cereals (1.0%)	Maize 98.4% | Sorghum and millet0.4% | Wheat & barley 0.9%
Oilseeds (4.1%)	Groundnuts 66.3% | Other oilseeds 33.7%
Pulses (1.2%)	Pulses 100%
Root crops (5.1%)	Cassava 48.0% | Sweet potatoes 16.9% | Irish potatoes 27.5% | Other roots 7.6%
Horticulture (12.4%)	Vegetables 23.2% | Fruit bananas 12.9% | Other fruits 63.9%
Export crops (5.0%)	Cotton 10.2% | Nuts 8.0% | Cocoa 5.6% | Coffee 53.2% | Other crops 22.4%
Other crops (4.5%)	Sugarcane 82.8% | Tea 4.6% | Tobacco 12.6%
Cattle and raw milk (14.7%)	Cattle meat 27.3% | Raw milk 72.7%
Other livestock (6.6%)	Poultry 56.0% | eggs 19.9% | Small ruminants 14.6% | Other livestock 9.5%
Fish (11.5%)	Capture fisheries 100%
Forestry (7.5%)	Forestry 100%

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

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