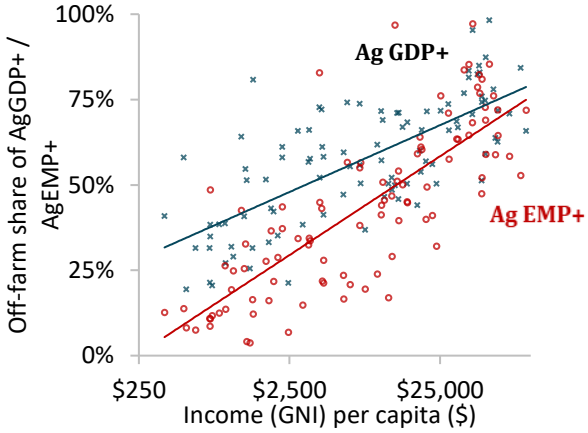
Measuring Changes in Rwanda's Agri-Food System

Transformation of the agri-food system (AFS) is a leading pathway to achieve the USG Global Food Security Strategy Objective 1 of "Inclusive agriculture-led growth". The AFS encompasses the primary agricultural sector, as well as all upstream and downstream agriculture-related activities. An expansion of the AFS's off-farm components is central to the process of agricultural transformation and is strongly associated with economic development. The *Percent change in value-added in the agri-food system (AgGDP+)* and *Employment in the agri-food system (AgEMP+)* indicators are useful to track this process.

Off-Farm Components of the AFS Become More Important as Countries Develop



Actual Results for 2017-2021 and Projections to 2022 Using Historical Trends

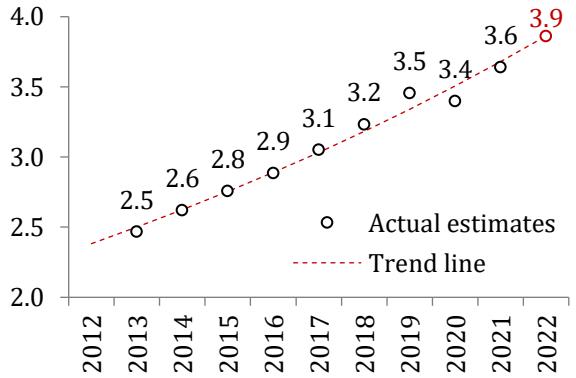
Indicators (* FTF indicator)	Units	Actual estimates 2017	2018	2019	2020	2021	Projected 2022
Total GDP	$ bil.	**8.0**	**8.7**	**9.5**	**9.1**	**10.1**	**10.8**
Agriculture	$ bil.	2.2	2.3	2.4	2.5	2.6	2.8
Agri-food (AgGDP+)	$ bil.	3.1	3.2	3.5	3.4	3.6	3.9
* Change from 2017	%	-	5.9	13.3	11.3	19.3	6.7
Total employment	**Mil.**	**5.9**	**6.1**	**6.3**	**6.3**	**6.5**	**6.7**
Agriculture	Mil.	3.6	3.5	3.3	3.5	3.6	3.4
* Agri-food (AgEMP+)	Mil.	3.9	3.8	3.7	3.9	4.0	3.8

Summary

- In 2021, the AFS generated 36% of total GDP in Rwanda and 60.7% of total employment, while agriculture alone represented 25.9% and 54.7%, respectively.
- AgGDP+ and AgEMP+ grew at 7.1% and 1.9% respectively between 2020 and 2021, reaching $3.6 billion and 4.0 million workers in 2021.
- If 2013-2021 trends continued, AgGDP+ and AgEMP+ would have reached $3.9 billion and 3.8 million workers by 2022.

Note: GDP is measured in constant 2019 US$

Projecting AgGDP+ in Rwanda ($ bil.)



Rwanda's Agri-Food System in 2020

This section provides data on the structure of Rwanda's economy as a whole and of its agri-food system in 2020. Table 1 shows the breakdown of national GDP, employment, and trade. Table 2 reports AgGDP+ and AgEMP+ estimates broken down by the components of the AFS. Table 3 disaggregates the latest AgGDP+ estimate across major products or value chains.

Table 1 shows how agriculture is an important part of Rwanda's economy – it generated 27% of national GDP and 56% of total employment in 2020. Crops dominate the sector, but forestry is also an important source of GDP and employment. Part of agriculture's output is supplied to the manufacturing sector for processing, and manufacturing as a whole generated 11% of GDP and 5% of employment. Rwanda depends heavily on agricultural and agro-processing exports (agro-processing exports are aggregated into manufacturing exports in Table 1), and most foreign earnings are used to pay for imported manufactured goods, such as machinery, vehicles, and refined petroleum. About two-fifths of total GDP is generated from services with finance & business the largest service subsector.

Table 1. Structure of Rwanda's Economy in 2020

Economic sector	Share of total (%)			
	GDP	Employ-ment	Exports	Imports
Total	**100**	**100**	**100**	**100**
Agriculture	**27.0**	**55.5**	**24.9**	**1.0**
Crops	16.5	33.7	22.2	1.0
Livestock	3.2	6.0	2.7	0.0
Forestry	6.9	15.0	0.0	0.0
Fishing	0.3	0.8	0.0	0.0
Industry	**30.5**	**23.3**	**41.3**	**86.5**
Mining	1.1	1.5	9.4	0.0
Manufacturing	10.8	4.5	31.9	86.4
Electricity & water	8.6	11.6	0.0	0.1
Construction	9.9	5.7	0.0	0.0
Services	**42.5**	**21.2**	**33.8**	**12.5**
Trade & transport	5.6	3.3	7.7	7.6
Hotels & food services	3.9	1.8	2.1	3.1
Finance & business services	20.5	4.1	23.1	1.3
Government, health & education	9.9	11.3	0.1	0.1
Other services	2.7	0.8	0.7	0.4

Source: IFPRI estimates using supply-use tables, national accounts, and ILO employment data.
Note: GDP is gross domestic product measured in constant 2019 US$.

The importance of agriculture for the economy extends well beyond the sector itself, with many industrial and service sectors forming parts of the AFS. Table 2 reports estimates of AgGDP+ and AgEMP+ by component of the AFS. Agriculture generated $2.5 billion in GDP and employed 3.5 million workers in 2020. Agro-processing generated a further $0.5 billion in GDP and 0.2 million jobs. Both sectors use domestic inputs, whose production created more value-added and jobs. However, the supply of inputs to farmers and processors account for a relatively small share of the AFS. Another off-farm component is the trading of agriculture-related products between farmers, processors, and consumers. This created $0.2 billion in GDP and employment for 0.1 million

workers, making it the third largest component of Rwanda's AFS. In total, Rwanda's AFS generated 37% of total GDP and 61% of employment in 2020.

Table 2. GDP and Employment in Rwanda's Agri-Food System in 2020

Economic sector	Value		Share of total	
	GDP ($ billion)	Employment (millions)	GDP (%)	Employment (%)
Total	**9.1**	**6.3**	**100**	**100**
Agri-food system	**3.4**	**3.9**	**37.2**	**61.4**
Agriculture	2.5	3.5	27.0	55.5
Agro-processing	0.5	0.2	6.0	2.9
Input supply	0.1	0.0	1.1	0.4
Trade & transport	0.2	0.1	1.9	1.1
Hotels & food services	0.1	0.1	1.2	1.4
Rest of the economy	**5.7**	**2.5**	**62.8**	**38.6**

Source: IFPRI estimates using supply-use tables and ILO employment data.
Note: GDP is gross domestic product measured in constant 2019 US$.

Table 3 breaks down the AFS into different value chains based on major product groupings. The cereals value-chain, for example, includes the on-farm cultivation of cereal crops (agriculture); the milling of cereals into flours (manufacturing); the trading and transporting of cereal products; and the preparation of meals in hotels and restaurants using raw and processed cereal inputs (food services). The cereals value-chain makes up 6.6% of Rwanda's AFS. The last column shows the share of off-farm components (beyond the farm gate) in AFS GDP by each value chain. For example, of the GDP generated by the cereals value-chain, 27.3% comes from off-farm activities.

Table 3. Breakdown of Rwanda's Agri-Food System GDP by Value Chains, 2020

Value chains	GDP ($ billion)			Share (%)			Off-farm share of total (%)
	Total	On-farm	Off-farm	Total	On-farm	Off-farm	
Agri-food system (AFS)	**3.4**	**2.5**	**0.9**	**100**	**100**	**100**	**25.1**
Cereals	0.2	0.2	0.1	6.6	6.4	7.2	27.3
Pulses & oilseeds	0.2	0.2	0.0	6.6	7.1	4.9	18.9
Roots	0.5	0.5	0.0	16.1	20.6	2.8	4.4
Horticulture	0.6	0.6	0.0	18.1	22.5	5.0	6.9
Livestock products	0.4	0.3	0.1	11.4	11.9	9.9	21.8
Fish products	0.0	0.0	0.0	1.1	1.2	0.7	15.3
Export-oriented foods	0.2	0.2	0.0	5.5	6.3	3.4	15.3
Export-oriented nonfoods	0.0	0.0	0.0	1.4	1.3	1.6	30.0
Forestry products	0.6	0.6	0.1	18.9	22.8	7.3	9.7
Beverages & other foods	0.5	0.0	0.5	14.3	0.0	57.2	100.0

Source: IFPRI estimates using supply-use tables.
Note: GDP is gross domestic product measured in constant 2019 US$. Off-farm GDP includes agri-food processing; trading and transport of agricultural and food products; food services; and the domestic production of inputs (see Table 2). The final column is the ratio of off-farm to total GDP generated by each value chain (column 3 divided by column 1).

Horticulture and roots were the largest agricultural value chain in 2020. Rwanda's value chains typically generate most of their value-added on the farm. Export-oriented nonfoods have a larger

off-farm GDP share, although it is only a small part of the overall AFS. Note that "beverages and other foods" include highly processed products whose agricultural origins are difficult to determine (e.g., baby foods and baked goods) or whose value-added is already assigned to other value chains (e.g., cereals used in the production of alcoholic beverages). As such, all the value-added for beverages and other foods is reported as occurring entirely off the farm.