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Perspectives on diversification prospects for the agrifood industry in Guyana

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Perspectives on diversification prospects for the agrifood industry in Guyana

By

Antonio Bubbico

Economist, Agricultural Development Economics Division (ESA), FAO

Michael Keller

Economist, Agricultural Development Economics Division (ESA), FAO

Cristian Morales Opazo

Senior Economist, Agricultural Development Economics Division (ESA), FAO

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Preface

The Co-operative Republic of Guyana currently faces at least three major challenges that demand immediate attention.

First, climate change is causing the sea level to rise, threatening to flood Guyana's coastal area. Most of Guyana's agricultural production occurs in the coastal area, which is home to the majority of the population.

Second, decreasing international commodity prices and the loss of preferential access to the European Union (EU) market have had a strong impact on the country's agricultural production. Guyana's sugar industry – formerly the main contributor to agricultural GDP – was hit hard by these changes. The government was encouraged to reduce the production of its biggest national enterprise GuySuCo by deactivating and privatizing part of the arable area and the industrial units; this affected the livelihoods of many Guyanese people.

Finally, offshore oil discoveries in Guyana will begin to produce results in 2020. This will bring about a significant increase in export earnings and government revenue. The additional funds offer a major development opportunity for Guyana, assuming they are spent in a sustainable way. However, the funds also present a challenge as they are likely to influence Guyana's labour supply, wages and exchange rate, which could impact the competitiveness of Guyana's overall economy and the agricultural sector.

Taken together, these factors require the government to rethink the future of the agricultural sector and to consider the potential for diversification in the coming years.

This paper analyses the structural changes underway in Guyana's economy and the agriculture sector and their consequences for productive, commercial and economic performance. The paper examines the export basket, identifies vulnerabilities and options for moving from concentration on a few commodities to a more diversified export basket.

The paper examines variables that may influence agricultural demand such as increased tourism, changes in the pattern of food consumption and the exploitation of new regional markets. It raises institutional issues such as insufficient credit, trade barriers and administrative and bureaucratic difficulties.

Finally, the paper proposes steps for addressing Guyana's agricultural challenges and opportunities with the aim of providing the country's agricultural sector with a blueprint for matching performance with the needs expressed in government plans.

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Acronyms

ACOI	Agriculture Credit Orientation Index
ACP	African, Caribbean, and Pacific Group of States
AEDP	Agriculture Export Diversification Program
ASR/BSI	American Sugar Refining/Belize Sugar Industry
CARICOM	Caribbean Community
COTED	Council for Trade and Economic Development
EBA	Everything But Arms
ES	Ecosystem services
ESA	Agricultural Development Economics Division
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
EVI	Economic vulnerability index
FAO	Food and Agriculture Organization of the UN
FDI	Foreign direct investment
GBoS	Guyana Bureau of Statistics
GDP	Gross domestic product
GFI	Green field investment
GNI	Gross national product
GuySuCo	Guyana Sugar Corporation
HHI	Herfindahl-Hirschmann Index
HS	Harmonized system
IES	Incentives for ecosystem services
ILO	International Labour Organization
IMF	International Monetary Fund
LFS	Labour force survey
LSCI	Liner Shipping Connectivity Index
MIC	Middle income countries
ND-GAIN	Notre Dame-Global Adaptation Index
NRCA	Normalized revealed comparative advantage

NTB	Non-tariff barriers
NTM	Non-tariff measures
SPS	Sanitary and phytosanitary standards
TFP	Total factor productivity
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization
WTTC	World Travel and Tourism Council

Executive summary

This report aims to guide policy-making in the Co-operative Republic of Guyana in support of the national agricultural development and diversification strategy and to foster a rapid, sustainable, and successful agricultural transformation process. The report seeks to identify the most critical challenges for Guyana's agricultural sector, to explore the relationships among agricultural diversification and agricultural development, and to determine the agricultural subsectors and products that have the potential for export.

Guyana has one of the largest agricultural economies in the Caribbean, with sugar, rice, and livestock representing the most important subsectors. As a result of structural changes in international markets, particularly in the European Union (EU), Guyana's agricultural sector, predominantly the production of export crops, has undergone a significant modification, losing some of its previous competitiveness. The importance of agriculture to the economy has also diminished due to the emergence of other sectors, such as mining and energy. Nevertheless, the agricultural sector is still a significant source of employment, especially in rural areas.

Traditional crops, such as rice and sugar, still generate most of Guyana's agricultural export revenues, but other commodities contribute significantly to foreign exchange earnings. Halting the decline in the agricultural sector and strengthening its resilience to new challenges, such as climate change, calls for a well-defined diversification strategy. However, any such strategy needs to be balanced and to focus on the entire value chain, not just on the primary outputs of the chain. Value chain development policies and programmes can enable Guyana to fulfil local, regional, and international demands for high-value agrifood products.

Improving the environment for farmers and agribusiness in Guyana will be key to the success of the diversification strategy. The country currently lacks the institutional capacity to meet private sector and international sanitary and phytosanitary standards or food safety requirements. These standards are often needed to access high-value markets, locally and internationally. Compliance with food safety standards will become increasingly important as diets continue to change, and consumer preferences and behaviours adapt as supermarkets capture a larger share of local value chains. Moreover, as the tourism sector grows, tourists will demand high-quality products which, if not available locally, will be substituted by imports, as is currently the case in Guyana. Improvements in port infrastructure and export procedures will also be needed to make any diversification campaign successful and promote intraregional trade. Our analysis revealed that exports from Guyana can be costly, given tariff and non-tariff barriers and the time it takes to ship products from local ports, making Guyanese products less competitive.

The report used a set of indicators to identify ten commodity sectors that might serve as a basis for promoting greater export diversification. Importantly, the ten sectors leverage Guyana's existing export capacity, making use of available value chain infrastructure, both physical and institutional. The commodity sectors of interest (and their subproducts) include oilseeds, bovine cattle, sunflower oil, fish flour for animal feed, palm oil, fowl, sheep, cocoa beans, cocoa paste and sunflower seeds. Identifying these sectors is a key first step in the development of dedicated value chains.

Diversifying Guyana's agricultural sector, expanding its export markets and establishing strong institutions that can guarantee consumers the supply of healthy and safe foods will require adequate financing. However, agriculture's share of total credit is declining in Guyana and is currently about half of its peak level in the mid-1990s. The emerging and rapidly growing energy sector, and the anticipated new revenues from oil and gas exports in the

2020s, are expected to drive economic growth. The resources arising from this growth could be partly used to finance necessary structural changes in the agricultural sector. However, the sudden increase in foreign exchange and a rapid appreciation of the local currency could lead Guyana to depend heavily on imports for its consumption needs, particularly for food, which could be significantly cheaper than domestically-sourced products and this may not be sustainable in the long term. Moreover, a rapid appreciation of the local currency, due to an increase in export demand for oil and gas, might also result in non-energy exports becoming less competitive in international markets and lead to further divestment away from agriculture.





1 Introduction and main objectives

Historically, agriculture played a central role in Guyana and the Caribbean economies. Large plantations – particularly of sugar and bananas – produced agricultural commodities for export; this represented a key sector of the economy and was an important legacy from the colonial period. Today, the situation is very different. Caribbean agriculture is more diversified. Reforms of European Union (EU) agricultural policies had a dramatic effect on export demand for sugar and bananas, and stimulated a restructuring of farming systems and a shift of exports from raw materials (agricultural products) to processed food products. Agriculture today also contributes a smaller share of the economy, with growth in other sectors.

Guyana is one of the leading agricultural producers in the Caribbean and is among the largest agricultural economies, with sugar, rice, and livestock as the most important subsectors. Guyana is a middle-income country and the third smallest nation in South America after Suriname and Uruguay, but it is the largest country in CARICOM, with about 750 000 inhabitants and a GDP per capita of nearly USD 4 700 in 2017. About 90 percent of Guyana's total population lives in the coastal plains, while the remaining 10 percent comprises largely indigenous populations inhabiting the country's extensive tropical rainforests.

While economic growth has slowed over the past two years to less than 2.5 percent per year, the economy of Guyana is expected to grow by around 3.5 percent on average in 2017–19 (Ministry of Finance, 2017). Services will remain the main contributor to growth, followed by the industrial sector, which is supported by a growing mining industry. The projected economic growth looks even more promising in the medium term, with growth rates of 10–30 percent between 2020 and 2023 (International Monetary Fund [IMF], 2018). The projected strong growth of Guyana's GDP per capita is due to the emerging oil productive capacity, which may lead to an unbalanced economic transformation and the potential for unsustainable development. The soaring growth should be carefully governed in order to ensure adequate resources for sustainable medium and long-term development.

Diversification in Guyana's agriculture sector is promoted through the Agriculture Export Diversification Program (AEDP), which was designed to endorse exports, particularly of the 4Ps (peppers, plantains, pineapples and pumpkin) and the 4Cs (coconut, citrus, cassava, carrots). The Government of Guyana recently began a process to divest and privatize the Guyana Sugar Corporation's (GuySuCo) assets. Sustainable private investments will be triggered by a diversification strategy on focused value chains, such as roots and tubers, herbs and spices, small ruminants, and fisheries, based on the CARICOM priority commodities.

Guyana's agriculture suffers from the negative impacts of climate change. Extreme flooding and droughts – triggered by El Niño and rising sea levels – affect the coastal areas of Guyana and cause severe income loss among farmers.

1.1 Objectives and organization of the report

The aims of this report are to identify the most important challenges for Guyana's economy, to explore the relationship between agricultural diversification and agricultural development and, finally, to identify the agricultural subsectors and products that have export potential for Guyana

The report is organized as follows. Chapter 2 provides an overview of Guyana's overall economy and primary sector and compares Guyana with selected country groups. Chapter 3

describes the structural transformation of Guyana's economy and the agricultural sector. Chapter 4 discusses the relationship between diversification and vulnerability. Chapter 5 analyses Guyana's current agricultural sector and identifies potential ways forward. Chapter 6 summarizes and concludes the report.

2 Provision of and access to financial services for small farmers and processors in the roots and tubers value chains

KEY MESSAGES

- ◆ Guyana's economy has grown over the past two decades, although more recently at a slower rate, due to falling international prices for some important commodities such as gold and sugar. Despite this, natural resource rents¹ in Guyana still represent around 20 percent of GDP and make the country extremely vulnerable to external shocks and market fluctuations.
- ◆ The recent discovery of oil presents huge possibilities for income generation, coupled with the risk of economic shocks due to high revenue income, abrupt exchange rate appreciation and potential loss of competitiveness in the international markets, and increased imports of consumption goods, especially food.
- ◆ Under similar circumstances, other countries have had both good and bad experiences in managing this kind of opportunity. The proper management of income and the pursuit of diverse investments have proved to be safe options for ensuring positive long-term effects and avoiding the so-called 'Dutch disease', which is described in Section 2.2.

2.1 Economic indicators

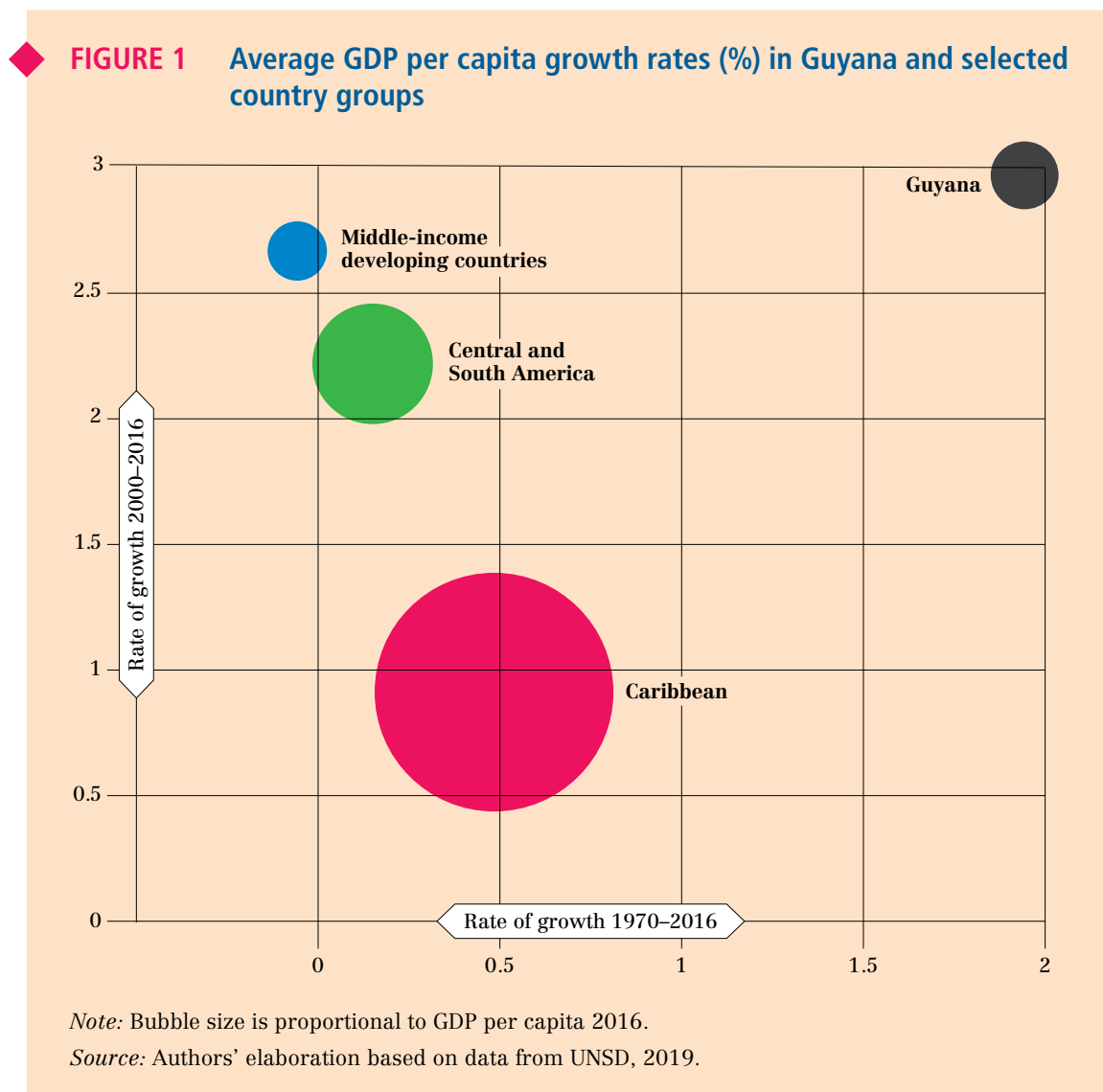
Guyana's growth rate has been relatively high in recent decades (see Figure 1). The country experienced a dramatic difference in both long- and short-term growth, compared to similar economies (i.e. middle-income countries or MICs)² and its neighbours (Caribbean and South American economies). Over the past ten years, most of Guyana's growth has been in the industrial and service sectors, which tend to grow more rapidly than the agricultural sector in middle-income economies.³ In terms of GDP per capita, Figure 1 shows that the country's GDP per capita (USD 4 456 in 2016) is in line with the GDP per capita in other MICs around the world. However,

¹ Natural resource rents are the difference between the value of production for a stock of the resource at world prices and the total cost of production (World Bank, 2019).

² According to the World Bank's description, middle income countries include all countries with a per capita gross national income of USD 1 026 to 12 475.

³ Although this tendency can be reversed for brief periods of time, especially if the terms of trade tilt in favour of agriculture.

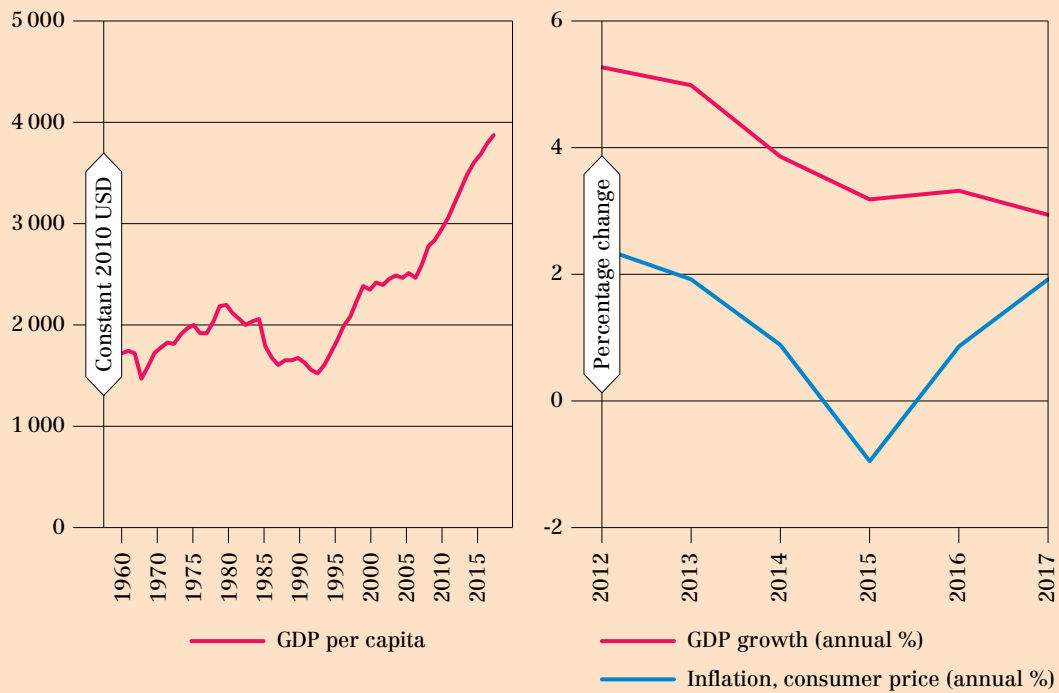
GDP per capita is significantly lower in Guyana than in the other Caribbean and South American economies, resulting in one of the lowest GDPs per capita in the CARICOM region. However, Guyana has the potential to grow more quickly than developed countries, because diminishing returns (in particular, to capital) are not as strong in Guyana as they are in capital-rich countries.



The left panel of Figure 2 shows the development of Guyana's per capita GDP over the last 60 years. It is clear that the good performance observed in Figure 1 (high long- and short-term economic growth) mainly occurred in the last 10 to 15 years. Between 2005 and 2016, Guyana's per capita GDP increased by more than 50 percent. This increase corresponded with a time of rising gold prices, upon which Guyana's economy partly depends. More recently, the country's economic growth slowed slightly (see Figure 2, right panel). GDP growth dropped from over 5 percent in 2012 to 3 percent in 2017. Inflation remained around 2 percent, with a drop to -1 percent in 2015.

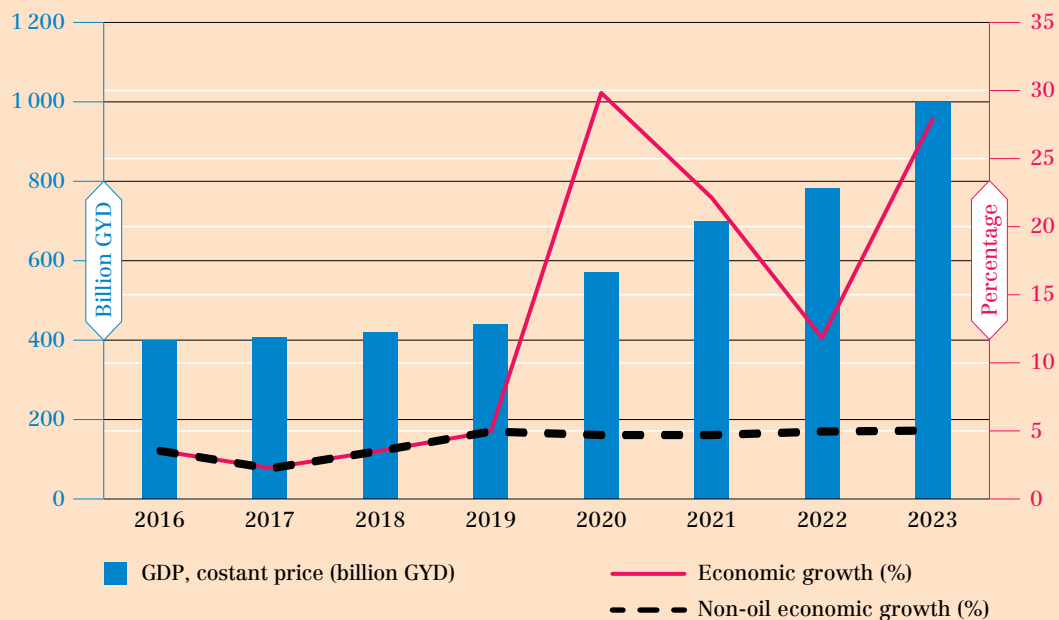
The outlook for Guyana's economic growth is extremely positive (IMF, 2018). Due to oil production and exportation, economic growth is estimated at 29 percent starting in 2020. (see Figure 3). However, it should be noted that, excluding the oil sector, economic growth is expected to stay at around 4 percent.

◆ **FIGURE 2** Guyana's GDP per capita and Inflation



Source: Authors' elaboration based on data from World Bank, 2019.

◆ **FIGURE 3** The IMF's GDP and economic growth predictions for Guyana

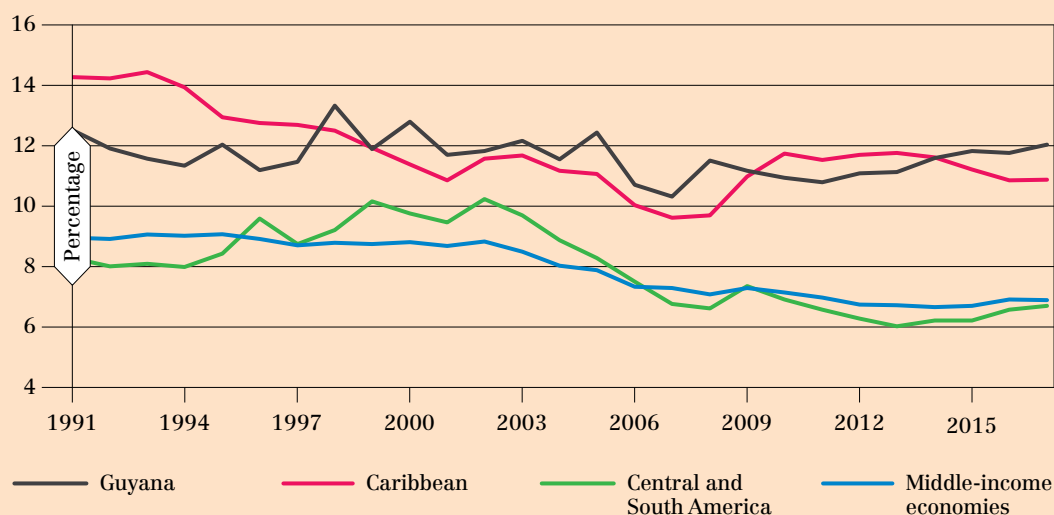


Note: GDP, constant prices (billion GYD) refers to the left y-axis, and economic growth and non-oil economic growth refer to the right y-axis.

Source: Authors' elaboration based on data from IMF, 2018.

Compared to a selection of other countries, which have similar economic characteristics, Guyana's performance is similar to other Caribbean countries in terms of unemployment, but worse than Central and South America and the MICs (see Figure 4).

FIGURE 4 Unemployment in Guyana and selected country groups



Source: Authors' elaboration based on data from World Bank, 2019.

2.2 The primary sectors of the economy and the potential for 'Dutch disease' in Guyana

Guyana's economy is strongly supported by natural resources. In fact, a significant percentage of GDP is based on minerals (mainly gold) and forest rents, which contributed 12 and 8 percent to GDP respectively in 2016 (World Bank, 2019). While services⁴ are increasingly gaining importance in the Guyana economy (contributing 59 percent to GDP in 2016), the agriculture and manufacturing sector have been left behind (contributing 15 and 6 percent of GDP respectively in 2016) (GBoS, 2019). While gold holds a strong position in Guyana's economy, the recent large-scale discoveries of oil are expected to become the main contributor to Guyana's GDP. The predominance of gold, and the general reliance on exports of natural resources, generates a risk of dependency and a potential that the so-called 'Dutch disease' will affect Guyana's economy (see Table 1). Dutch disease is defined as "changes in the structure of production that are predicted to occur in the wake of a favourable shock, such as discovery of a large natural resource or a rise in the international price of an exportable commodity that is perceived to be permanent (Brahmbhatt, Canuto and Vostroknutova, 2010)." Whether an economy is affected by Dutch disease can generally be assessed by looking at the development of the service sector, the movement of resources across sectors and the appreciation of the exchange rate ('spending effect'). The section provides an assessment of the prevalence of Dutch disease in Guyana's gold sector, which is followed by brief outlook on the potential for Dutch disease in the context of recent oil discoveries.

⁴ Services include electricity and water, construction, wholesale and retail trade, transportation and communication, financial and insurance activities, public administration, education, health and social services, and real estate activities.

Large-scale discoveries of natural resources prompt the development of one sector at the cost of others, since natural resource booms generally result in the contraction of the non-boom tradable sector (i.e. manufacturing and agriculture) and the expansion of the non-tradable sector (i.e. services) that is driven by the booming sector. In 2006, gold mining accounted for only 5 percent of GDP, but a boom in international prices and a simultaneous increase in production caused it to dramatically grow to over 17 percent of GDP by 2017 (GBoS, 2019). This trend has been mirrored by a stagnation in the manufacturing and a slight decline in the agriculture, forestry and fishing sectors.

◆ **TABLE 1** Gross domestic product shares in Guyana (%)

Sector	2012	2013	2014	2015	2016	2017	2018
Agriculture, forestry and fishing	19	19	19	20	15	15	15
Mining and quarrying	21	18	15	15	23	21	22
of which is related to gold	18	15	12	11	19	17	18
Manufacturing	6	7	6	7	6	6	6
Services	58	60	64	62	59	61	61
Total	100	100	100	100	100	100	100

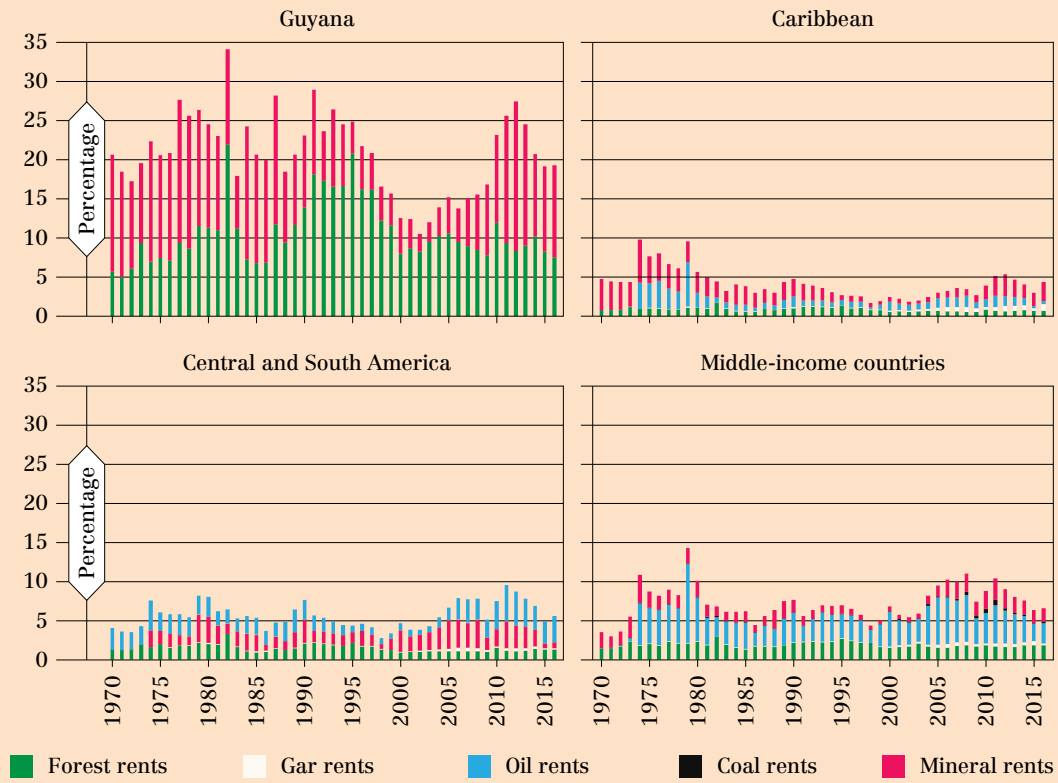
Source: GBoS, 2019.

Compared to neighbouring economies and MICs, Guyana's natural resources rents represent a notable percentage of its GDP, amounting to 20 percent on average over the past five decades. This is around three to five times as much as in MIC (7 percent), the Caribbean (4 percent) and Central and South America (6 percent) (see Figure 5). Guyana has not opted to follow a large-scale, export-led extractive blueprint, as has been the case in other resource-rich developing countries, such as Ghana and Peru. While Guyana's gold-mining sector consists to a large degree of local small and medium-scale operators, it is still at risk of facing similar issues, if local interests are not prioritized (Hilson and Laing, 2017).

Nevertheless, the vulnerability of Guyana's economy to gold dependency is clear. The domestic manufacturing sector represents only a small part of the economy and is sustained by rice and paddy milling. Companies in the agriculture, construction and mining sectors rely on imported intermediate goods because Guyana does not produce such goods. Machinery and tractor imports increased at a yearly average rate of 5.4 percent between 2000 and 2016 (World Integrated Trade Solutions, 2018). Between 2003 and 2014, the imports of capital goods increased significantly for all sectors (see Figure 6).

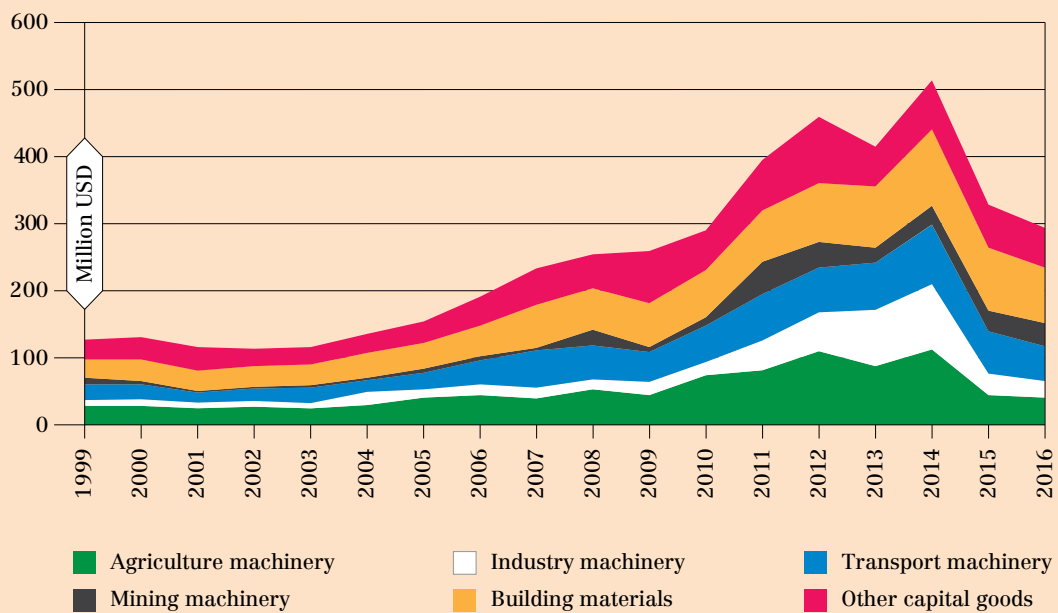
The predominance of gold in Guyana's economy is evident when itemizing the contributions of total exports. Gold contributed on average 48 percent to export revenues between 2010 and 2018. During this period, the contribution of gold increased by 13 percentage points from 39 percent to 52 percent (see Table 2). The growing contribution of gold has come at the expense of rice and paddy, bauxite, and timber. Furthermore, sugar exports have decreased significantly, from 11.5 percent in 2000 to only 1.4 percent in 2018, which can largely be attributed to the phasing out of preferential access to EU markets (see Table 2). On the other hand, shrimp, prawns and fish are increasing their share in exports. A more detailed analysis of Guyana's agricultural export products will be provided in Section 5.

FIGURE 5 Natural resource rents (% of GDP) in Guyana and selected country groups



Source: Authors' elaboration based on data from World Bank, 2019.

FIGURE 6 Imports of capital goods to Guyana by category



Source: Authors' elaboration based on data from the GBoS, 2019.

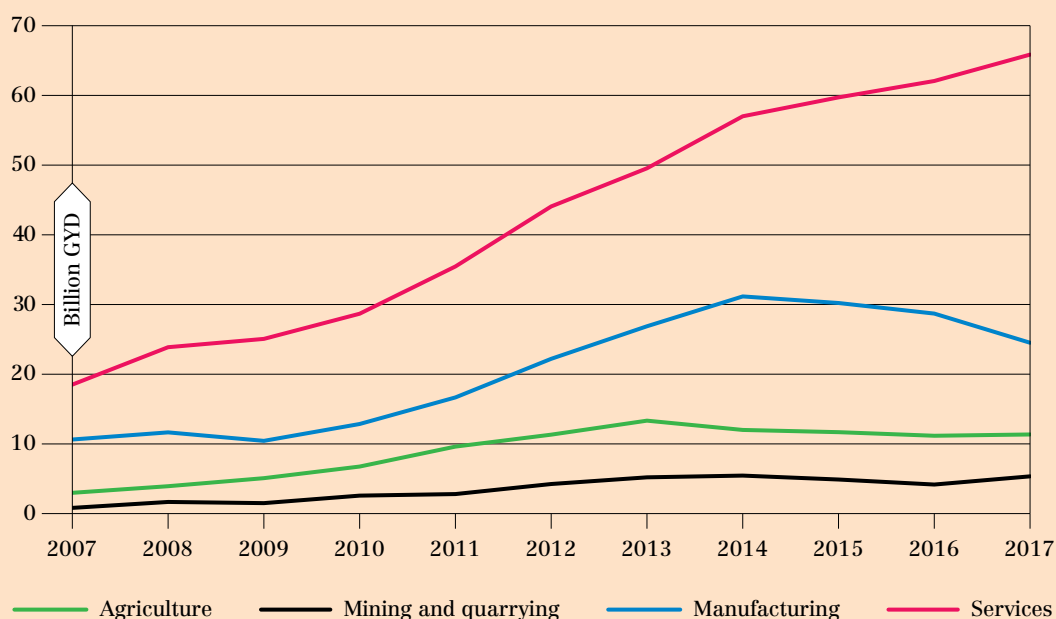
♦ **TABLE 2** Gross domestic product shares in Guyana (%)

Item	2010	2011	2012	2013	2014	2015	2016	2017	2018
Raw gold	39.1	45.8	50.7	47.2	40.3	43.5	57.9	56.8	52.1
Rice and paddy	17.1	15.3	13.9	17.4	21.4	19.2	12.5	14.0	15.7
Bauxite	12.9	11.8	10.7	9.8	10.7	9.1	6.4	7.3	9.2
Shrimp and prawns	3.3	2.2	3.4	3.9	2.8	3.7	3.5	3.8	6.5
Sugar	11.5	10.9	9.3	8.3	7.5	6.8	5.1	3.4	1.4
Fish and by products	1.6	1.6	1.1	1.7	2.5	3.0	2.3	3.2	2.7
Timber	5.5	3.5	2.8	2.8	4.6	3.8	2.8	2.5	2.5
Prepared foods	2.0	1.8	1.7	1.9	2.1	2.0	2.0	2.0	2.0
Bottled rum and other spirits			1.4	1.4	1.6	1.9	1.8	1.9	2.3
Diamonds	0.8	0.9	0.6	0.9	1.3	1.5	1.3	0.9	
Fruit and vegetables									0.8
Molasses	0.7	0.8							
Re-exports	1.3	1.7	1.5	1.0	1.1	1.5	0.9	0.8	0.6
Other exports	4.3	3.6	3.0	3.7	4.2	4.1	3.5	3.5	4.1
Total	100	100	100	100	100	100	100	100	100

Source: GBoS, 2019.

The service sector and gold production hold a key role in Guyana's economy, contributing 61 percent and 18 percent to its GDP respectively (see Table 1). The development of the gold sector was favoured by an expansion in financial services for gold mining throughout the last decade, which has had a significant impact on financing for local mining activities (Hilson and Laing, 2017). The past few years have seen a strong increase in commercial bank loans, especially in the service sector. While loans have also increased for mining activities and agriculture (with a small decrease between 2013 and 2016), loans for manufacturing have been constantly falling since 2014, reflecting the stagnation of the manufacturing sector, which could be interpreted as a symptom of the Dutch disease (see Figure 7).

The 'resource movement effect' (Corden, 1984) of Dutch disease can be seen in the shift of workers from sectors, such as agriculture, into the booming sector. That effect was not evident in Guyana between 2012 and 2017 (see Table 3). In fact, the agriculture employment share in total employment during this period stayed constant at around 17.5 percent. On the other hand, the employment share in the mining sector fell by almost half, from 8.2 percent in 2012 to 4.8 percent in 2017. Nevertheless, the production of gold increased by 47 percent, from around 13 600 kg in 2012 to just over 20 000 kg in 2017 (Guyana Bureau of Statistics, 2018). At the same time, diamond production increased by 23 percent, from around 40 000 metric carats in 2012 to 52 000 metric carats in 2017. Growing consumption – triggered by the booming sector – resulted in increased employment in the accommodation and food service sectors, from 2.8 percent in 2012 to 4.7 percent in 2017. The increase in mining activities may also explain the rise in the employment share of administrative and support services, from 3.7 percent in 2012 to 4.7 percent in 2017 (see Table 3).

FIGURE 7 Commercial bank loans by sector


Source: Authors' elaboration based on data from GBoS, 2019.

TABLE 3 Employment by economic sector (%)

Economic sectors*	2012	2017**
A. Agriculture, forestry and fishing	17.5	17.8
G. Wholesale and retail trade	15.4	17.1
O. Public administration and defence	7.2	8.8
F. Construction	10.4	8.4
C. Manufacturing	8.6	7.7
H. Transportation and storage	7.7	6.6
P. Education	5.3	5.7
B. Mining and quarrying	8.2	4.8
N. Administrative and support services	3.7	4.7
I. Accommodation and food service activities	2.8	4.7
Q. Human health and social work activities	2.7	2.6
T. Activities of households as employers	2.3	2.3
S. Other service activities	2.7	2.3
K. Financial and insurance activities	1.3	1.2
Not classifiable by economic activity	0.3	1.05
M. Professional, scientific, and technical services	1.0	1.0
E. Water supply, sewerage, waste management	0.5	0.9

Economic sectors*	2012	2017**
J. Information and communication	1.0	0.9
D. Electricity, gas, steam, and air con	1.0	0.9
U. Activities of extraterritorial organizations	0.2	0.7
R. Arts, entertainment and recreation	0.6	0.5
L. Real estate activities	0.1	0.0

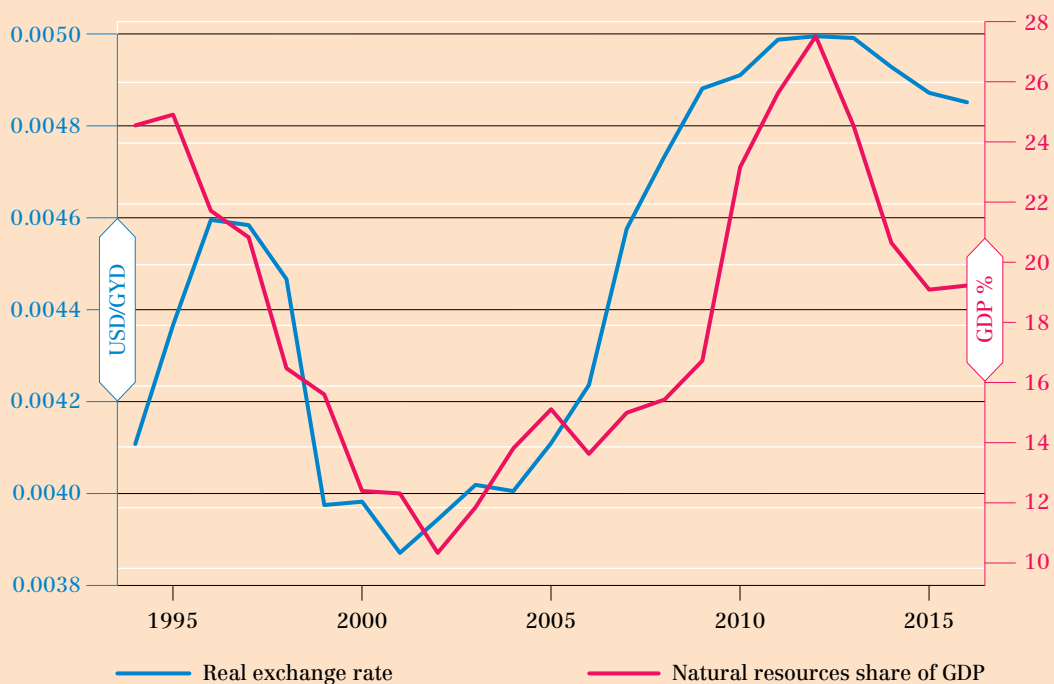
Note: * Economic sectors are classified according to the International Standard Industrial Classification of All Economic Activities (ISIC), Ref. 4 (United Nations, 2008); ** 2017 data are from the third quarter.

Source: Labour force surveys (LFS), GBoS, 2019.

The second signature feature of the Dutch disease is the ‘spending effect.’ The spending effect is associated with increasing prices in the non-tradable sectors (i.e. services), which provoke the appreciation of the exchange rate and limit the competitiveness of the tradeable sector in the international market (Wenner *et al.*, 2018). Comparing the real exchange rate between the Guyanese dollar and US dollar confirms the presence of the spending effect. Since 1995, Guyana’s natural resource rents (in % of GDP) have synchronized closely with the real exchange rate (see Figure 8).

Guyana is expected to become an oil producer in 2020, which will influence economic development significantly. After the first oil discoveries in 2015 by Exxon Mobile, estimated oil reserves ranged between 800 and 1 400 million barrels. These estimates were updated due to further discoveries in 2017–18 to around 3.2 billion barrels. The IMF predicts that government revenues could benefit in the peak year (2027/28) by up to GYD 800 billion (see Figure 9).

◆ **FIGURE 8** Real exchange rate and natural resource rents

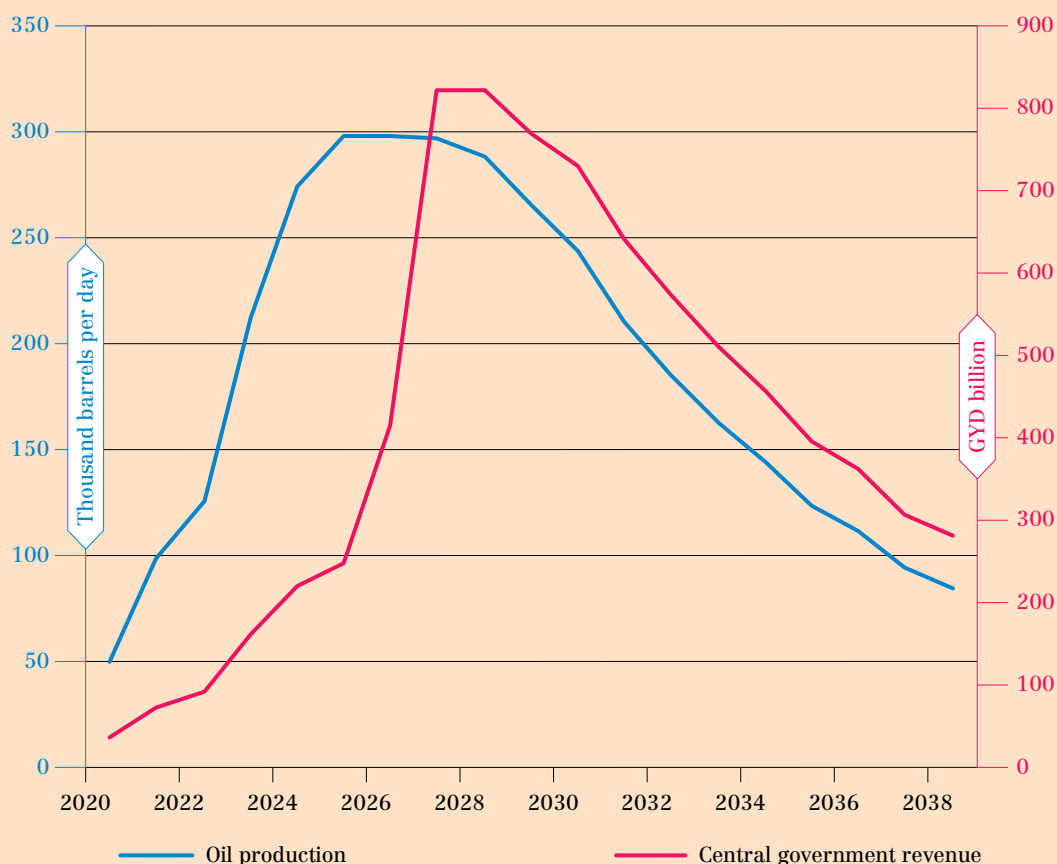


Source: Authors’ elaboration based on data from World Bank, 2019.

This financial windfall holds vast potential for the country and its development. The management of oil revenues, however, will require careful consideration and forward-looking decision-making, not only in the context of oil extraction but also with respect to the rest of the economy. Revenues from oil production could be used, for example, to invest in the sustainable development of non-oil sectors, the education system and social-security programmes, ultimately stimulating inclusive growth and a reduction of poverty rates. To inform this process, Guyana could use the experience of other countries as blueprint to inform and design a forward-looking reform agenda. Both Botswana and Norway successfully managed to translate the financial windfalls from oil discoveries into inclusive growth and improved living standards for their citizens. Similarly, less successful cases, such as Nigeria and Venezuela, where oil exports worsened the living standards of large parts of the population, could hold valuable lessons for decision makers.

Oil and gold share common characteristics. For example, both are not produced in the traditional manufacturing sense, but are extracted. This means that the income they generate are ‘windfalls’ and can lead to Dutch disease, as explained above. At the same time, oil and gold differ in some respects. For example, the oil extraction industry is very capital-intensive, especially the establishment of offshore wells, while gold extraction is relatively more labour intensive. Thus, the rising oil industry in Guyana will not generate a lot of employment. Indeed, Dutch disease effects can create pressure on existing industries, especially in the tradeable sectors (e.g. agriculture).

◆ **FIGURE 9** IMF’s predicted oil production and government oil revenues



Source: IMF, 2018.

3 Structural change, the role and performance of the agricultural sector

KEY MESSAGES

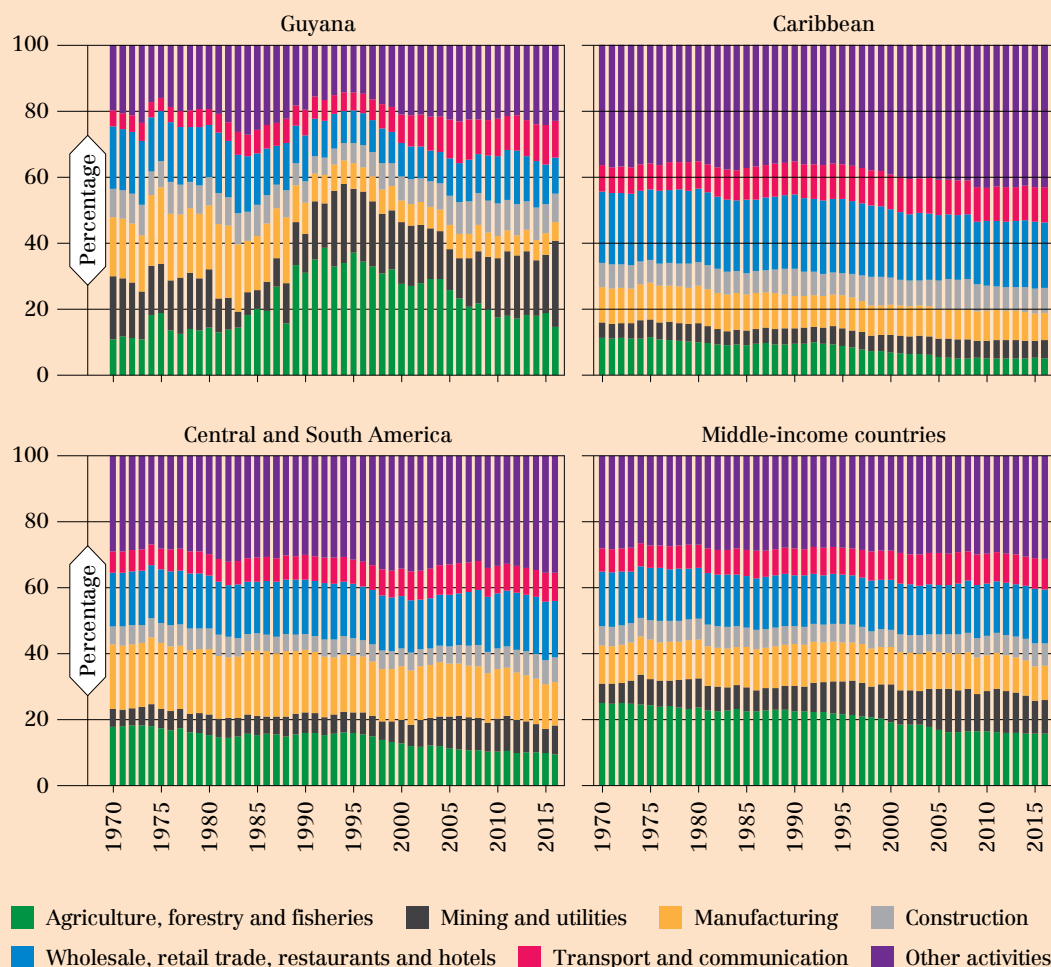
- ◆ Guyana's recent economic development resembles that of other countries, with the importance of agriculture decreasing in terms of GDP and employment, although this is occurring at a slower rate than in other countries in the region.
- ◆ Historically, sugar was the country's most important product, but in recent years the loss of preferential access to the European market and a change in eating habits have drastically reduced sugar prices, strongly impacting the entire national economy. In contrast, rice has grown in share of value-added generation, exports and acreage.
- ◆ Although they have reversed positions in terms of their relative importance in recent years, rice and sugar still account for approximately 70 percent of the cultivated area in Guyana and 45 percent of the net value generated by agriculture, highlighting their importance to the national economy.
- ◆ In recent years, Guyana has experienced low growth in agricultural productivity. Sectoral growth has been due to the expansion of the agricultural area at the expense of original vegetation, especially forests, which points to the need for greater attention to issues of sustainability and environmental preservation.

The process of economic development involves a series of structural transformations that are common to all countries. However, the intensity and rhythm with which they occur depend on a series of historical, economic, institutional, and social factors.

When compared to similar economies (i.e. middle-income countries or MICs)⁵ and its neighbours (Caribbean and South American economies), a number of important differences can be observed between Guyana and the selected countries with regard to the share of sector contribution to the economy (see Figure 10). First, while the contribution of agriculture to GDP in the country groups has continuously decreased since 1970, in Guyana the agricultural contribution increased until 1992, after which it followed suit with a continuously decreasing agriculture share in GDP. Second, the contribution of the mining and utilities sector to GDP is more important in Guyana than in the selected country groups. At the same time, a common trend in both Guyana and the selected country groups is the ever-increasing importance of the service sector. Financial services, real estate and public administration are particularly relevant service subsectors.

⁵ According to the World Bank's description, middle income countries include all countries with a per capita gross national income of USD 1 026 to USD 12 475.

◆ **FIGURE 10** Share of sectors in GDP in Guyana and selected country groups

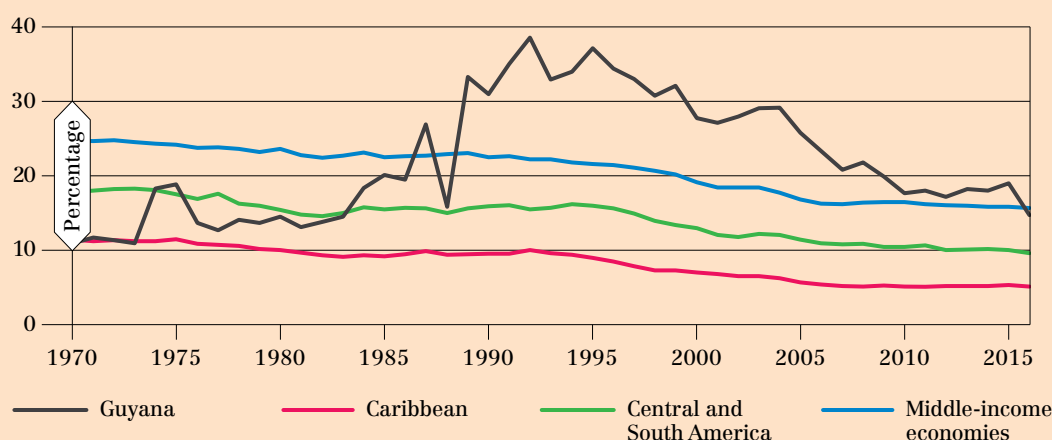


Source: Authors' elaboration based on data from UNSD, 2019.

Agriculture has been the main driver of transformation in Guyana in recent decades, with high agricultural productivity growth both before and during the transition away from an agricultural economy. As can be seen in Figure 11, the contribution of agriculture to Guyana's GDP increased rapidly between 1970 and 1993, followed by a strong decline. As a result, the share of agriculture in the overall economy has tended to decline as GDP per capita has grown in the last ten years. By contrast, MICs, Caribbean and South and Central America economies have experienced a steady process of structural transformation away from agriculture since 1970. Between 1970 and 2016, the share of agriculture in GDP steadily eroded in the selected country groups.

Considering the status of its manufacturing, mining and utilities sectors in 1970, Guyana was one of the most industrialized countries in the developing world. It was more industrialized than the average Caribbean, Central and South America or MIC state. The industrial sector was characterized by the growing importance of manufacturing between 1970 and 1988. Most manufacturing was, as it continues to be, involved in the processing of agricultural products (especially sugar and rice). The huge increase of agricultural contribution to GDP between 1988 and 1989 was due to the corresponding fall of the manufacturing sector (from 20.1 percent in 1988 to 11.2 percent in 1989), which, in turn, was related to the collapse of the sugar industry.

◆ **FIGURE 11** Share of agriculture in national GDP in Guyana and selected country groups



Source: Authors' elaboration based on data from UNSD, 2019.

3.1 Share of agriculture in national GDP and economic performance

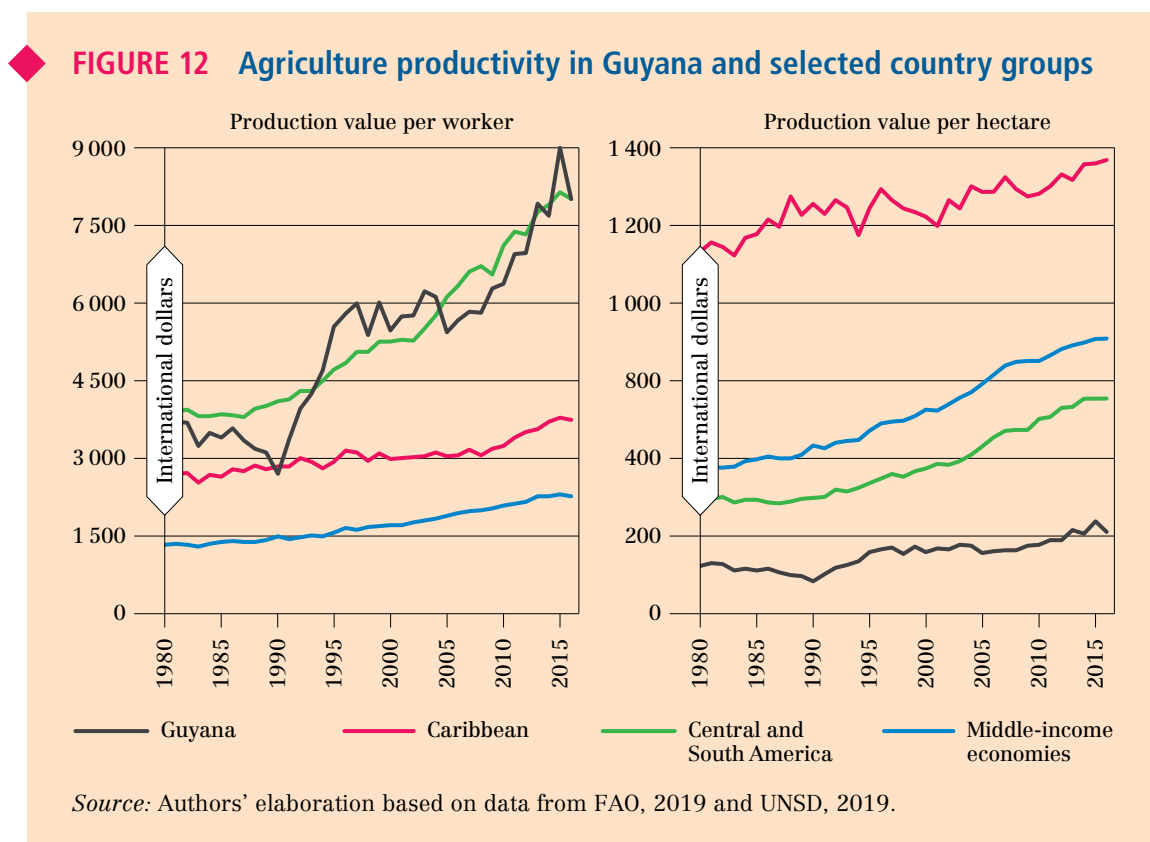
Since 1989, the GDP share of Guyana's mining and utilities sector has consistently outflanked manufacturing due to deindustrialization, which led to the reduction of manufacturing GDP share (from 11.2 percent in 1989 to 5.6 percent in 2016). A similar deindustrialization phase occurred in Central and South America and, to a lesser extent, in the Caribbean and the MICs. Comparing this dynamic internationally, while in Asian countries shares of manufacturing in GDP consistently increased over recent decades, Latin American and African countries embarked on a deindustrialization process similar to undertaken by advanced economies. Several studies have found that in recent decades the share of manufacturing employment in developing countries peaked and began to decrease at lower levels of GDP per capita compared to the past (Felipe et al., 2014; Palma, 2005; Rodrik, 2016; United Nations Conference on Trade and Development [UNCTAD], 2003, UNCTAD, 2016). In the literature, this phenomenon has been referred to as 'premature deindustrialization,' an expression originally coined by UNCTAD (2003).

Guyana, like Central and South America, has experienced 'negative' deindustrialization.⁶ This can result from economic failure, which affects a poorly performing economy or an economy that faces challenges in the manufacturing sector. In such cases, falling manufacturing output or higher productivity in manufacturing create unemployment, thereby depressing incomes (Rowthorn, 1994; Rowthorn and Wells, 1987; UNCTAD, 1995). Dutch disease can drive a premature deindustrialization. Policies promoting specialization in accordance with the comparative advantage of natural resources replace policies generating a trade surplus from manufacturing (Palma, 2005). Data for Guyana between 2012 and 2016 show that the fall in manufacturing employment (see Table 3) was not associated with a fall in manufacturing shares in GDP (see Figure 10). This means that the manufacturing sector became less labour-intensive due to rapid labour productivity growth. The rise of labour productivity is good news for the long-term growth prospects of the economy as it

⁶ Rowthorn and Wells (1987) distinguish between two types of deindustrialization: positive deindustrialization, which occurs in developed economies as a natural result of sustained economic growth, and negative deindustrialization, which occurs at all income levels.

benefits from the “growth-pulling effects of manufacturing” (Tregenna, 2009). Aside from Guyana’s shift away from agriculture as a main component in GDP since the nineties,⁷ a key characteristic of a common agricultural transformation process is an increase in productivity in the agriculture sector. This indicates that while the relative importance of agriculture to the overall economy is decreasing, the agriculture sector is becoming more productive and making more efficient use of scarce resources – both may be driven and reinforced by productivity increases in other sectors of the economy. The importance of diversification for yield increase is discussed in Section 4 and 5.

As can be seen in Figure 12, Guyana achieved large increases in labour productivity at the same time as land profitability was stagnating – a typical pattern that can be observed in countries that engage in cropland extensification during a structural transformation process (thus increasing the ratio of cropland area per worker). The same phenomenon occurred in a number of Central and South America countries.



As a complement to considering agricultural value per labour or per land, estimating total factor productivity (TFP)⁸ allows us to evaluate the development of sector productivity over time. Total factor productivity growth in the agriculture sector of Guyana was around 1.3 percent, slightly higher than the 1.2 percent rate in other countries in Latin America and the Caribbean (see Table 4). The TFP growth in Latin America and the Caribbean as well as in Guyana was mainly driven by technical change (Nin-Pratt *et al.*, 2015). This means that producers far from the efficiency frontier were unable to catch up to current best practices in the sector, however, best practices (efficiency frontier) were further improved, e.g. through technological innovation or transfer and research and development.

⁷ The decrease occurred at roughly 4 percent of reduction per year.

⁸ Total factor productivity is defined as the portion of output not explained by the amount of inputs used in production.

Caribbean and middle-income economies achieved balanced growth through a constant increase in land and labour productivity (see Figure 12). As a result, the gains in land productivity were slightly larger. This development is typical in circumstances where cropland area experiences no or only moderate increases, while profitability by hectare increases due to other drivers.

◆ **TABLE 4** Growth rate of agricultural total factor productivity and its components, 1981–2012 (%)

Country	TFP growth rate (1981–2012)	Efficiency component of TFP	Technical change component of TFP
Bahamas	1.5	0.4	1.2
Barbados	-0.6	-0.2	-0.4
Belize	0.5	-0.1	0.7
Guyana	1.3	-0.8	2.1
Haiti	-0.9	-1.8	1.0
Jamaica	0.9	1.0	-0.1
Suriname	-0.1	-0.3	0.2
Trinidad and Tobago	1.2	0.9	0.3
Latin America and the Caribbean	1.2	0.3	0.9

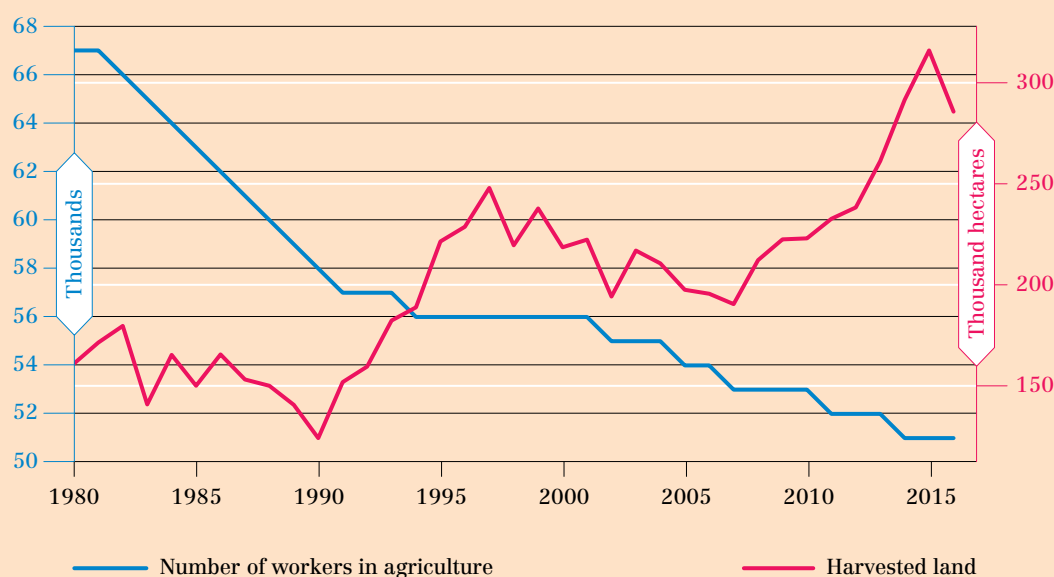
Source: Nin-Pratt *et al.*, 2015.

Guyana is characterized by stagnating land profitability, although a moderate increase in production value per hectare can be observed starting in 2000 (Figure 12, right panel). At the same time, Guyana experienced a major increase in cultivated area at the beginning of the 1990s and 2000s (see Figure 13). In the context of low agricultural productivity, the expansion of agricultural land into natural vegetation comes at a high cost in terms of soil carbon, biodiversity and ecosystem services loss, while providing comparably limited production increases. Land expansion in Guyana commonly increases existing pressures on forested land, which is vitally important for water flow regulation and for reducing soil erosion and the risk of mudslides.

An integrated land use strategy that actively considers the various environmental and resilience benefits of natural vegetation is extremely important for Guyana. The active conservation of ecosystem services provided by natural vegetation is a precondition to productive agricultural systems over long-term planning horizons. Farmers may need support to overcome barriers to implementing sustainable agricultural practices that increase food security and the supply of ecosystem services. Incentives for ecosystem services (IES)⁹ promote an integrated approach to planning and investment in agricultural and environmental measures, by both public and private sector ecosystem service users.

⁹ Incentives for ecosystem services (IES) are packages of measures to support farmers in adopting sustainable agricultural practices that will benefit the environment and protect long-term food security. Farmers face barriers that limit their ability to invest the time and capital required to adopt sustainable practices that provide more ecosystem services. Incentives from public policy and private investment can be used to help farmers overcome these barriers and promote better management of crops, livestock, forests and fisheries.

FIGURE 13 Number of workers and hectares of harvested land in Guyana



Source: Authors' elaboration based on data from FAO, 2019 and UNSD, 2019.

In conclusion, Guyana has experienced a classical structural transformation process. Overall, agricultural employment has declined, while the productivity of agricultural labour has increased. The sizable increase in labour productivity has been strongly driven by cropland area expansion, while there has only been a moderate reduction in the agricultural labour force.

3.2 Share of agriculture in total employment

Another key characteristic of the structural transformation process is the reduction of the agricultural share in national employment. Figure 14 depicts the employment shares for agriculture, industry and service sectors across Guyana and selected country groups.

While the level of agricultural employment may differ, all country groups have experienced some reduction in the share of agricultural employment; these changes have been gradual and fairly minor since 1990. This indicator does not provide further evidence of strong structural change over the last decades – at least not to a degree that would have provided lucrative employment opportunities to a large share of agricultural workers.

In his classic article, Timmer (1988) proposed as relevant threshold for structural transformation a drop in the share of agricultural labour force falls below 20 percent. While agriculture remains an important employment source in Guyana, accounting for around 18 percent of the workforce in 2017, all country groups, including Guyana, have experienced a significant transformation of employment opportunities in the service sector. In Guyana, the employment share in the agricultural sector decreased from above 30 percent in 1991 to 18 percent in 2017, a reduction of 12 percentage points. During the same period, the service sector increased its employment share by around 9 percentage, points from 46 percent in 1991 to 55 percent in 2017.

When considering labour statistics, it is important to bear in mind that self-employment and female agricultural employment are often underreported (Palacios-Lopez et al., 2017; Cai and Pandey, 2015). The actual level of agricultural employment may thus be higher than

the official shares reported here. Nevertheless, it is clear that Guyana has experienced a continuous and considerable reduction in total people employed in agriculture over the past few decades (see Figure 13).

◆ **FIGURE 14** Employment shares by sectors in Guyana and selected country groups



Source: Authors' elaboration based on data from World Bank, 2019.

3.3 Agricultural production in Guyana

The respective importance of major agricultural commodities in Guyana has significantly changed over time. The transformation of agricultural trade policies has been a major reason that previously predominant crops – such as sugar – have become less prominent. In the case of sugar, the combined effect of eroding preferential access to the EU market and the opening of the EU market to other least developed country competitors, as part of the Everything But Arms (EBA) initiative,¹⁰ led to a major reduction in the crop's economic importance in Guyana (ECLAC, 2011).

¹⁰ The European Union introduced the Everything But Arms initiative in 2001 with the aim to promote development of the world's poorest countries. Under the initiative all imports to the EU from Least Developed Countries will be duty- and quota-free, with the exemption of armaments (EU, 2012).

Starting in the 1970s, Guyana's sugar industry operated under preferential agreements with the EU, such as the ACP/EU Sugar Protocol, according to which the EU agreed to purchase 160 000 metric tonnes of sugar at an agreed price. In 2008, the EU purchase price for Guyana sugar was EUR 485 per tonne; between October 2009 and September 2012; the minimum EU export price for Guyana's sugar was set at EUR 301.5 per tonne. This was the last guaranteed price provided by the EU in the final years of its preferential agreement with Guyana. With EU preferences removed, Guyana's sugar exports and related foreign exchange earnings are likely to fall significantly since EU purchases accounted for up to 90 percent of Guyana sugar exports. The elimination of EU preferences exposes the Guyana sugar industry to the rigorous competition of the world sugar market.

In addition to the change in export markets, a transition in nutrition preferences, the increasing formalization of agricultural value chains and – in part – an increasing awareness and valuation of product quality may drive commodity transformation. In the following pages, we will analyse major regional trends in seven commodity groups: cereals, roots and tubers, other crops (cocoa, beans, coconuts, green coffee, ginger, groundnuts with shell, pepper [*piper spp.*], soybeans, spices, sugar cane, unmanufactured tobacco, natural gums), fruits, vegetables, pulses, and livestock products.

After independence at the end of the 1970s, Caribbean economies focused on import substitution, industrialization and, more recently, on export-oriented agriculture based on banana and sugar production (Williams and Smith, 2008). In October 2004, the World Trade Organization (WTO) determined that the EU subsidies for sugar, which were beneficial to sugar producers in the Caribbean and elsewhere, broke global trade rules. In response, the EU agreed to revise its regime in late 2005; this included a 36 percent reduction in the EU's guaranteed sugar price (Clegg, 2015). In September 2007, the EU announced its intention to end its sugar protocol by 2009. However, Caribbean sugar exports were given duty-free access, without a guaranteed price. A significant drop in sugar exports – starting in 2008/2009 – followed. With the exception of Belize, the land dedicated to cultivating sugar declined in all the Caribbean economies. This has been reflected in export trade and value.

The result of dismantling the sugar industry for the EU market has been a shift from a centrally-organized system based on export production, to a system serving domestic markets (Lowitt et al., 2015; Saint Ville et al., 2016; Weis, 2004; 2007). The large-scale production of traditional crops, especially sugar, and the institutions behind production and marketing those crops have disappeared with the erosion of preferential access to European Union markets (Williams and Smith, 2008).

Figure 15 shows that Guyana's harvested land is characterized by a stable share of area devoted to cereals, vegetables and pulses, while fruits have gradually expanded their share of total land at the expense of sugar and other crops.

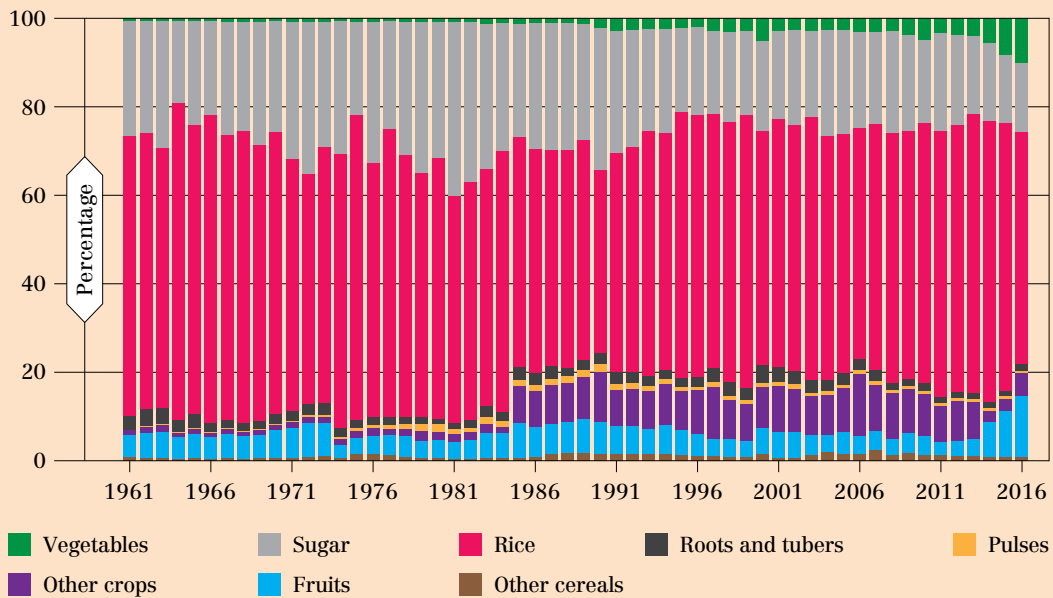
Figure 16 shows the composition of the total net value produced by agriculture. Over time, the contribution by rice has gradually increased at the expense of other crops (mainly sugar). This development can be explained by a particularly high production value per hectare for cereals. Moreover, in the case of livestock, the net value reached about 20 percent, with a gradual increase starting in 2000.

Turning to rice and sugar production, Figure 17 compares Guyana's performance with that of the main international competitors in those two industries. It is clear that while Guyana competes with the main market actors in terms of rice productivity, its sugar production lags behind, with a decreasing yield trend beginning in 2003.

Figure 18 shows Guyana's five main agricultural exports by destination. Rice export is destined for several countries, while sugar cane export is very concentrated on the UK and five other importers. The figure makes clear the international competitiveness of Guyana's

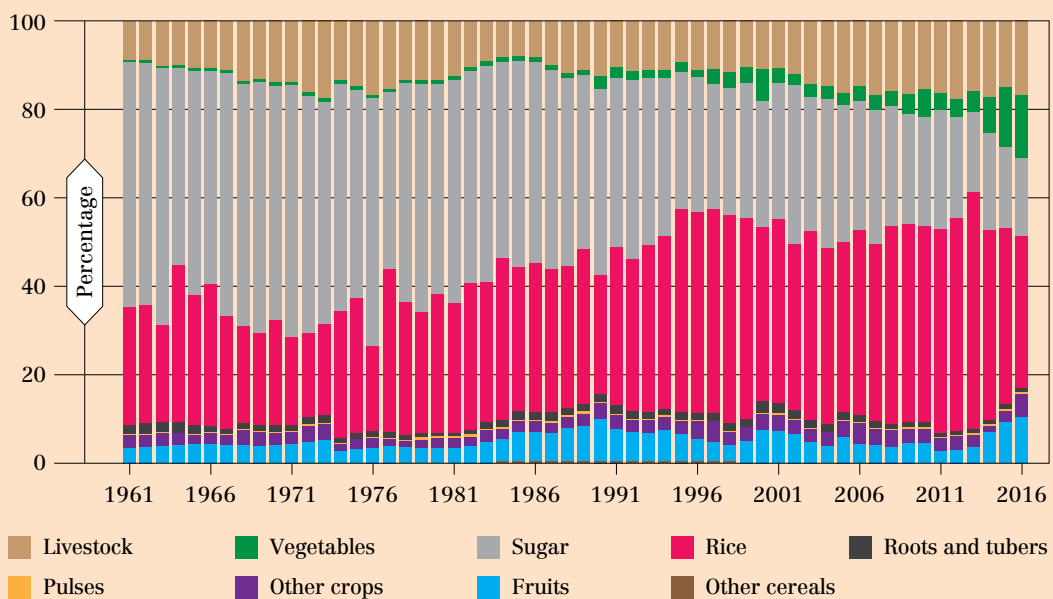
rice. Nevertheless, Rogers et al. (2017) found that the average production cost of a metric tonne of rice in Guyana is uncompetitive compared to other large producers (the USA, India, Pakistan, Thailand and Vietnam). This may represent a cause for reduced export market diversification. In this case, it would be necessary to reduce production costs to avoid the need to search for premium bilateral deals as a diversification strategy.

♦ **FIGURE 15** Composition of harvested area by crop groups



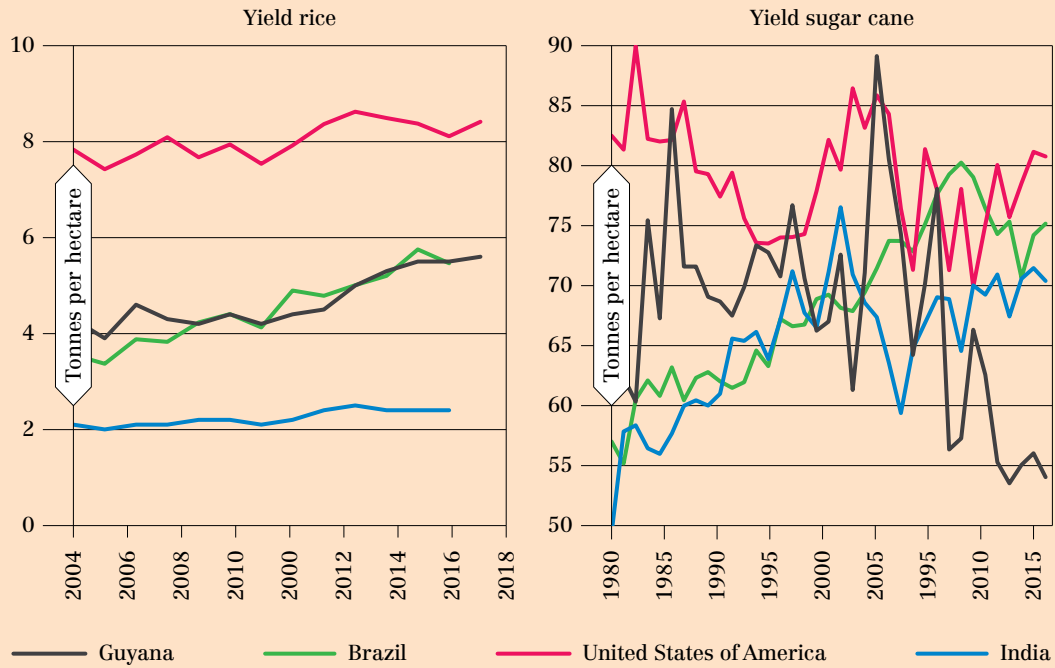
Source: Authors' elaboration based on data from FAO, 2019.

♦ **FIGURE 16** Composition of production net value by crop groups and livestock



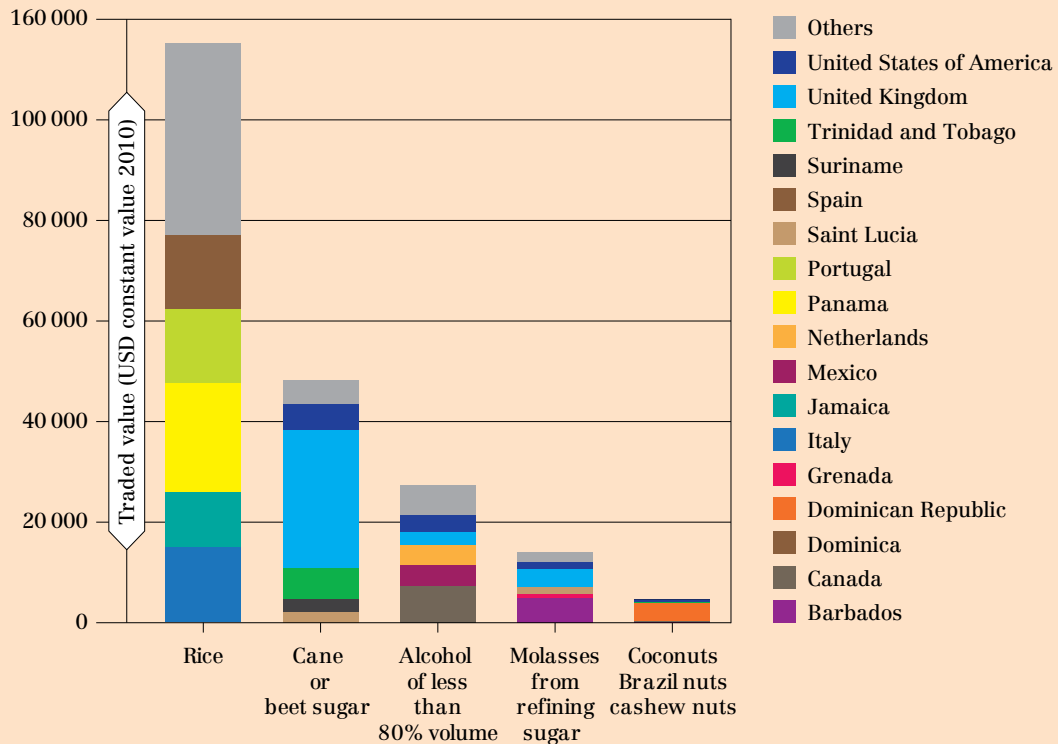
Source: Authors' elaboration based on data from FAO, 2019.

◆ **FIGURE 17** Yield in rice and sugar cane in Guyana



Source: Authors' elaboration based on data from GBoS, 2019 for rice yield, and from FAO, 2019 for sugar cane.

◆ **FIGURE 18** Guyana's main agriculture exports by destination, 2016



Source: Authors' elaboration based on data from UN Comtrade, 2019.

4 Trade, diversification and economic vulnerability

KEY MESSAGES

- ◆ Guyana's high dependency on a few export commodities and export markets is a source of risk due to unstable international prices and the lack of a sufficiently large internal market to compensate for external shocks.
- ◆ Diversification can help reduce Guyana's economic vulnerability by spreading the risk over more commodities and markets. Furthermore, diversifying into climate change-resilient commodities can help to reduce Guyana's elevated risk from natural disasters.
- ◆ Diversifying agricultural exports in Guyana has the potential for high economic return to the country. However, achieving greater diversification of the country's product mix may require significant resources as well as the need to overcome a dependency on legacy crops.

Diversification is an important strategy for developing countries to promote sustainable development, which has been recognized in the 2030 Agenda for Sustainable Development, specifically in Sustainable Development Goals 8.2¹¹ and 9.b.¹² Many studies have tried to understand the relationship between economic diversification and economic development. Using simulation experiments, Freire learned that “an effective diversification strategy has to focus on the emulation of production that already exists in more diversified countries, and target products that require a similar set of technologies already in existence in the country, but that have higher complexity than the average country exports complexity” (Freire, 2017).¹³

Freire underlines three main empirical findings in the diversification literature:

- ◆ More diversified countries are associated with higher levels of GDP (see, for example, Lei and Zhang, 2014).
- ◆ Economic diversification leads to exports of less ubiquitous¹⁴ products than the existing exports (see, for example, Hausmann and Hidalgo, 2011).

¹¹ Goal 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value-added and labour-intensive sectors.

¹² Goal 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, *inter alia*, industrial diversification and value addition to commodities.

¹³ A product is considered more complex than another when it is produced by fewer countries that are also more diversified, which suggests that it requires a more exclusive set of technologies to be produced.

¹⁴ Ubiquity is defined as the number of countries that export a product.

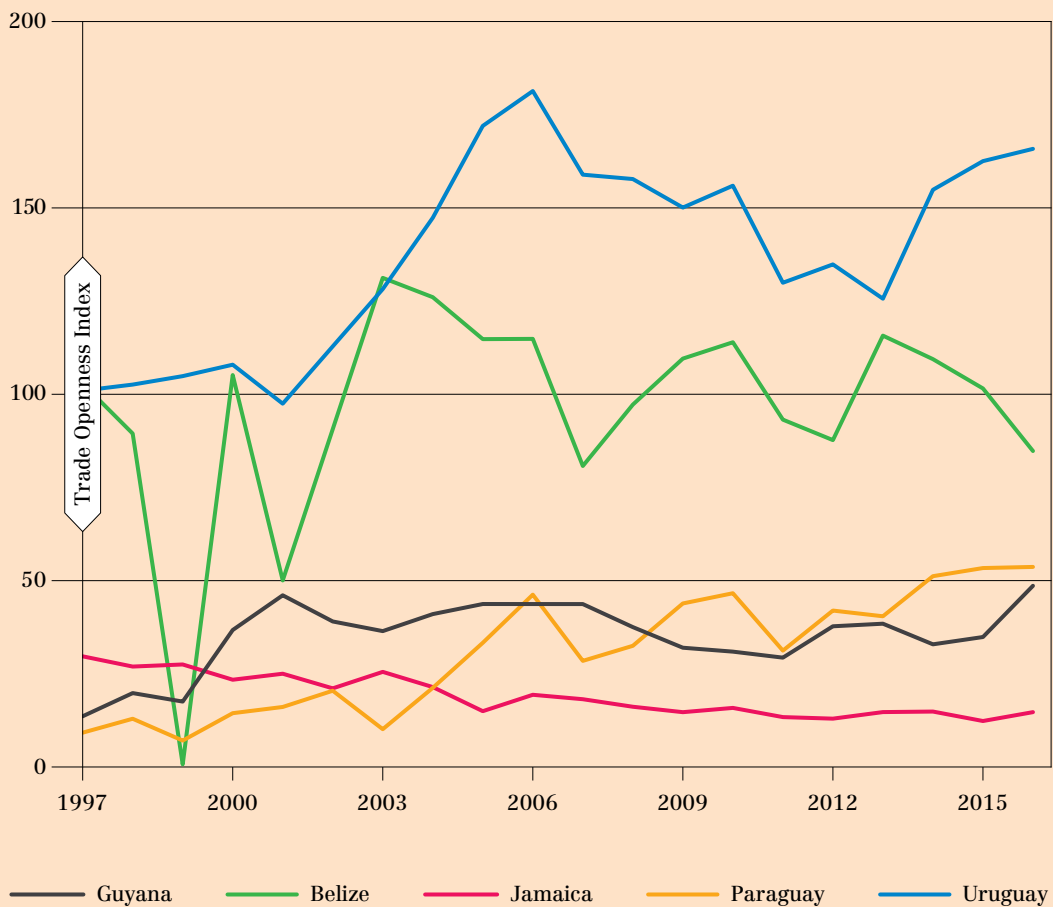
- ◆ The existing product mix of a country affects the emergence of potential new products, particularly in the agrifood sector. This means that diversification is path dependent, i.e. today's level of diversification depends on the past level of diversification. A result of the path dependency is a difficulty in 'leapfrogging,' i.e. moving directly from the production of one product to another that is far away is difficult due to the lack of the necessary productive capacities in the country.

The experience of Belize in successfully diversifying from sugar specialization is relevant for Guyana. Morris *et al.* (2017) show that sugar diversification policies in Belize have a spatial dimension. Policy interventions focus on the northern region of Belize where – according to their projections – a sizable proportion of sugar farmers would be in danger of losing their livelihoods without support. The weak international price of sugar makes farmers here particularly vulnerable, with a considerable risk of unemployment and need for social assistance. Such support is not necessary in the western region of Belize, since the number of vulnerable farmers is far lower here and workers are more likely to be absorbed by alternative agricultural production. The sugar industry's strategic development plan, prepared by American Sugar Refining/Belize Sugar Industries (ASR/BSI), aims to (i) increase sector competitiveness by focusing on efficiency and yield increase; (ii) to enable diversification into other activities for farmers who will not be able to earn a livelihood from sugar production. To implement its reform agenda of increasing efficiency and yields, ASR/BSI obtained a USD 15 million loan from the Inter-American Development Bank in 2019 (IDB, 2019). Yet, the focus of the IDB loan seems to be on increasing the production and exports of higher value-added sugars (IDB, 2019), while it remains unclear how diversification activities outside of the sugar industry will be supported. The experience of Belize holds valuable lessons for Guyana. Revenues from oil production put Guyana in a unique position to implement large-scale investments in the sustainable development and diversification of its agricultural sector. This has the potential to reduce the dependency of the agricultural sector on sugar and to enable farmers to continue earning their livelihood from agricultural activities in the future. Yet, Belize's policy design indicates that accounting for spatial dimensions could improve the targeting of reforms.

Trade is fundamental for the development of the agricultural sector in Latin America and the Caribbean. Figure 19 shows the aggregated value of the trade in agricultural products (export plus imports as a percentage of agricultural GDP) for some benchmark states. In smaller states, such as Belize and Uruguay, agricultural trade is higher than agricultural GDP and, while agricultural trade is lower in Guyana, it still equals roughly 40 percent of agricultural GDP. This measure is defined as 'agricultural trade openness,' which shows the level of a country's integration with the rest of the world in terms of the agricultural products market. The literature supports the existence of a positive relationship between openness and economic growth (Huchet-Bourdon *et al.*, 2018). The historic focus on a few export-oriented commodities in the Caribbean, a legacy of the colonial period and past trade agreements with the EU, have limited the development of a competitive agricultural sector. Moreover, many Caribbean states depend on food imports due to their narrow range of natural resources, including land on smaller islands. Guyana's main constraint to developing a competitive agricultural sector instead relates to the scale of its internal market due to a small population size. Moreover, the country's high dependency on a few export commodities is a source of risk because of unstable international prices and markets.

The Export Concentration Index, also known as the Hirfindahl-Hirschmann Index, is used to measure trade concentration. An index value close to one indicates that a country's exports are highly concentrated on a few products. Values closer to zero suggest that exports are more homogeneously distributed among a series of products. Figure 20 shows the indices for Guyana's overall economy as well as for the agricultural sector. While the overall economy displays an increasing trend toward export concentration in the last two decades, the agricultural sector shows a trend toward decreased concentration between 2005 and 2012. This positive trend in the agriculture sector was interrupted by a high volatility in the Hirfindahl-Hirschmann Index between 2013 and 2017. The volatility of the index in recent years was due to an increasing concentration on rice production in Guyana.

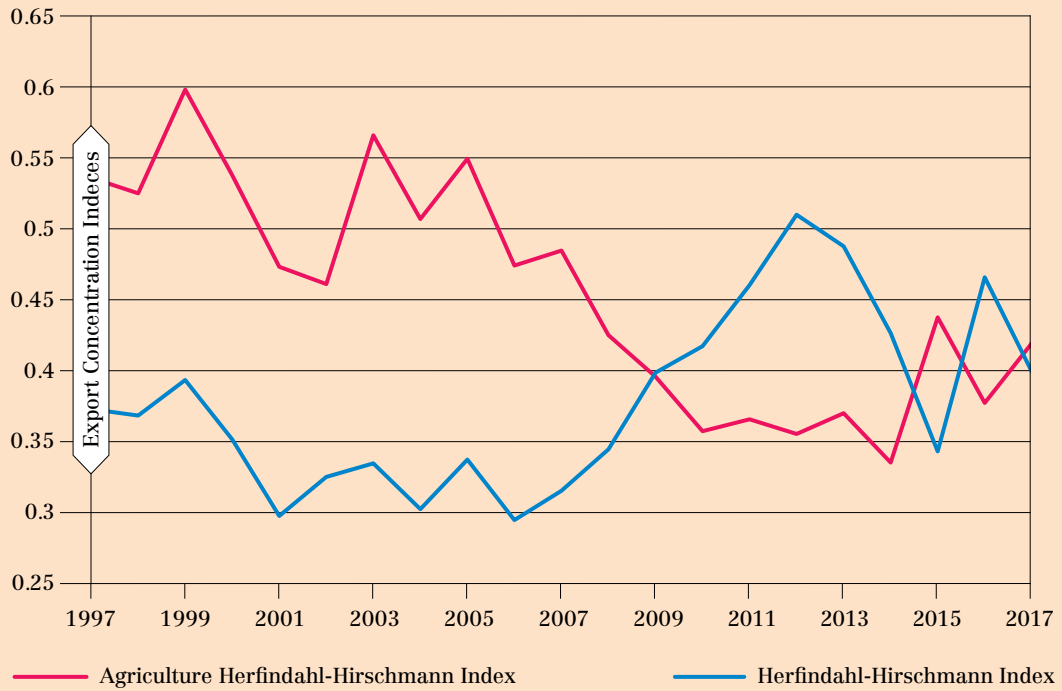
◆ **FIGURE 19** Agricultural trade openness in selected countries



Source: Authors' elaboration based on data from UN Comtrade, 2019.

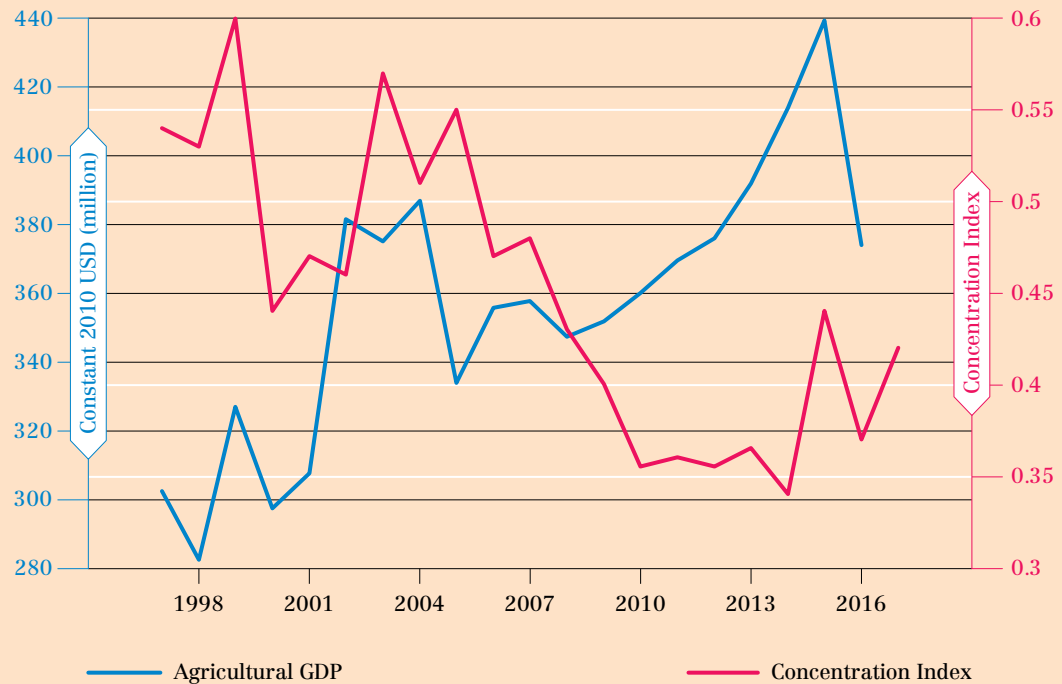
Figure 21 depicts the Agricultural Export Concentration Index and agricultural GDP of Guyana from 1998 to 2016. The relationship between the two variables seems to be negative, such that an increasing concentration index leads to lower agricultural GDP and vice versa. This indicates the importance of diversification in the agriculture sector to promote economic growth in Guyana.

FIGURE 20 Export Concentration Index in Guyana



Source: Authors' elaboration based on data from UN Comtrade, 2019.

FIGURE 21 Agricultural Export Concentration Index and agricultural GDP in Guyana



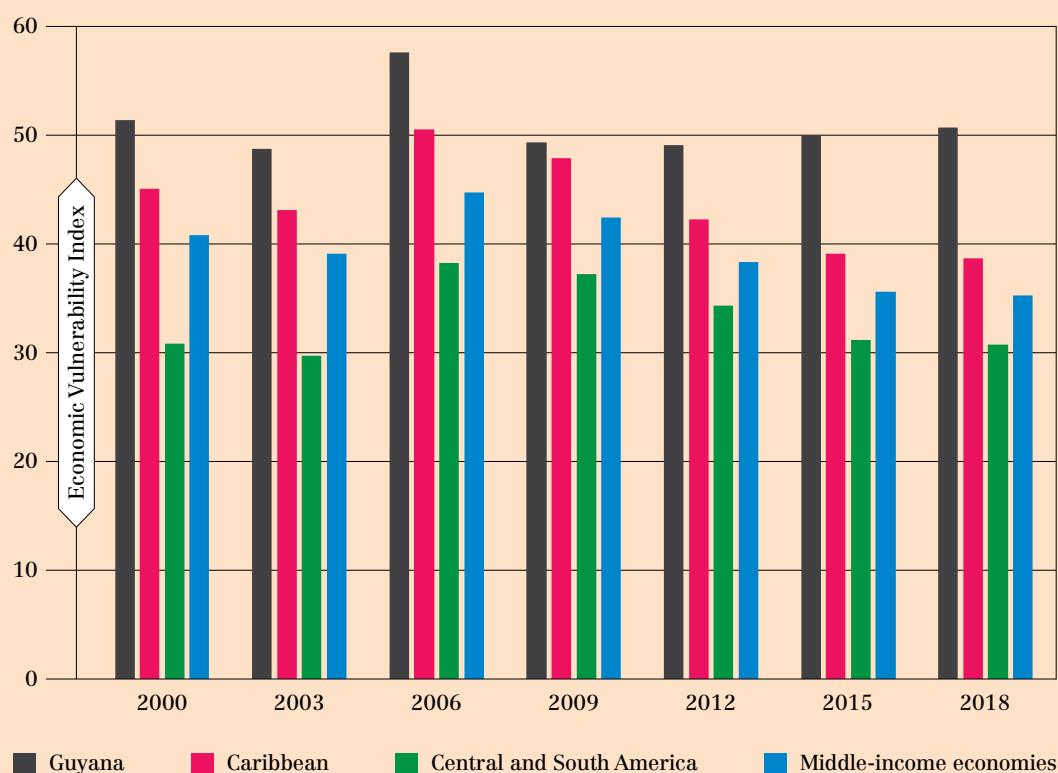
Source: Authors' elaboration based on data from UN Comtrade, 2019.

4.1 Economic vulnerability

Economic vulnerability is defined as the likelihood that a country's economic development process can be obstructed by exogenous events, often called external shocks (Cariolle, 2011; Guillaumont, 2009a; 2009b). We used the Economic Vulnerability Index (EVI) developed by the United Nations to describe the economic vulnerability of Guyana and the selected country groups. This consists of two main determinants: the size and likelihood of shocks, and the exposure to these shocks (Guillaumont, 2009b). The two determinants depend on a country's structural features (geographic location, human capital, economic diversification, etc.). Exposure is measured through: i) population size; ii) remoteness; iii) merchandise export concentration; iv) share of agriculture, forestry and fisheries in gross domestic product. The size and likelihood of shocks are measured by: v) homelessness owing to natural disasters, vi) instability of agricultural production, vii) instability of exports of goods and services, and viii) the share of population living in low elevated coastal zones. The EVI ranges between 0 and 100, with higher scores corresponding to greater levels of vulnerability and lower scores corresponding to lesser levels of vulnerability.

Figure 22 shows the EVI for Guyana and the selected country groups from 2000 to 2018. Guyana's EVI hovers around a value of 50 over the past 20 years, with a peak in 2006. This value is quite high; none of the selected country groups can be considered as vulnerable as Guyana. A further concern is that while the Caribbean, Central and South American countries and MICs have reduced their vulnerability since 2009, Guyana demonstrates a small increase in vulnerability. Reducing Guyana's economic vulnerability and susceptibility to exogenous shocks should, hence, play an important role in any future reform agenda.

◆ **FIGURE 22** Economic vulnerability in Guyana and in selected country groups



Source: Authors' elaboration based on data from the United Nations, 2019.

4.2 Vulnerability to natural hazards and readiness for adaptation

To describe economic and natural vulnerability in Guyana and the selected country groups, we analysed the Notre Dame-Global Adaptation Index (ND-GAIN), a composite index built by Chen *et al.* (2015). The index measures a country's vulnerability to climate disruption and readiness to leverage private and public sector investment for adaptive actions (see Figure 23).

Vulnerability is defined as the “propensity or predisposition of human societies to be negatively impacted by climate hazards (ND-GAIN, 2015)”. The ND-GAIN index evaluates six dimensions in terms of vulnerability: health, food, water, ecosystem services, human habitat and infrastructure. Each sector is in turn characterized by six indicators representing three crosscutting components: the exposure¹⁵ of the sector to climate-related or climate-exacerbated hazards; the sensitivity¹⁶ of that sector to the impacts of the hazard; and the capacity¹⁷ of the sector to cope or adapt to these impacts.

Readiness is defined as the capacity of making “effective use of investments for adaptation actions thanks to a safe and efficient business environment (ND-GAIN, 2015).” Readiness is measured by three components: economic readiness,¹⁸ governance readiness¹⁹ and social readiness.²⁰

¹⁵ Exposure: The extent to which human society and its supporting sectors are stressed by future climate conditions. Exposure in ND-GAIN captures the physical factors external to the system that contribute to vulnerability.

¹⁶ Sensitivity: The degree to which people and the sectors they depend upon are affected by climate-related perturbations. The factors increasing sensitivity include the degree of dependency on climate-sensitive sectors, and the proportion of the population that is sensitive to climate hazards due to factors such as topography and demography.

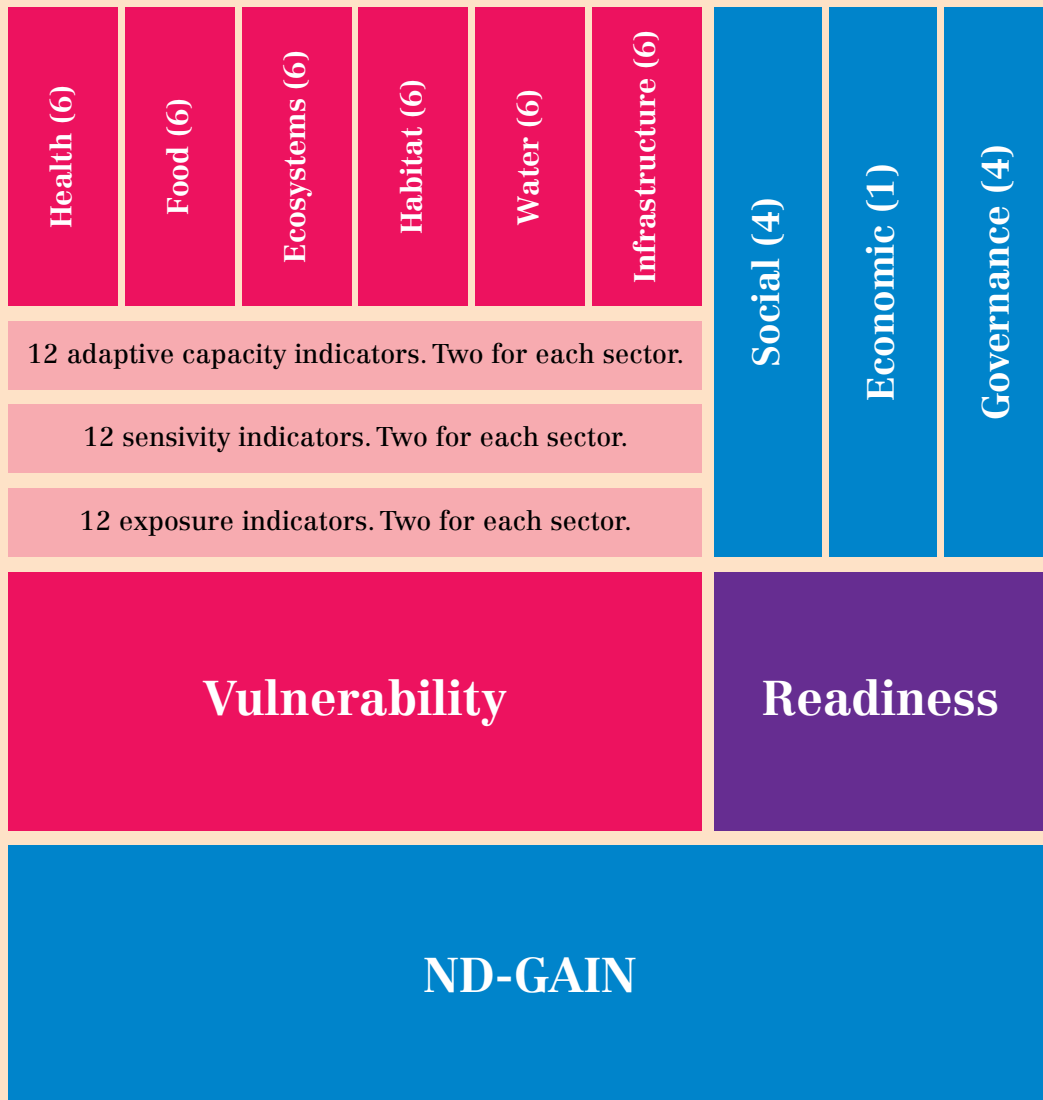
¹⁷ Adaptive capacity: The ability of society and its supporting sectors to adjust in order to reduce potential damage and respond to the negative consequences of climate events. In ND-GAIN, adaptive capacity indicators seek to capture a collection of means that are readily deployable to deal with sector-specific climate change impacts.

¹⁸ Economic readiness: The investment climate that facilitates mobilizing capital from the private sector.

¹⁹ Governance readiness: The stability of the society and institutional arrangements that support investment risks. A stable country with high governance capacity reassures investors that invested capital could grow with the help of responsive public services and without significant interruption.

²⁰ Social readiness: The social conditions that help society make efficient and equitable use of investment and to yield more benefit from the investment.

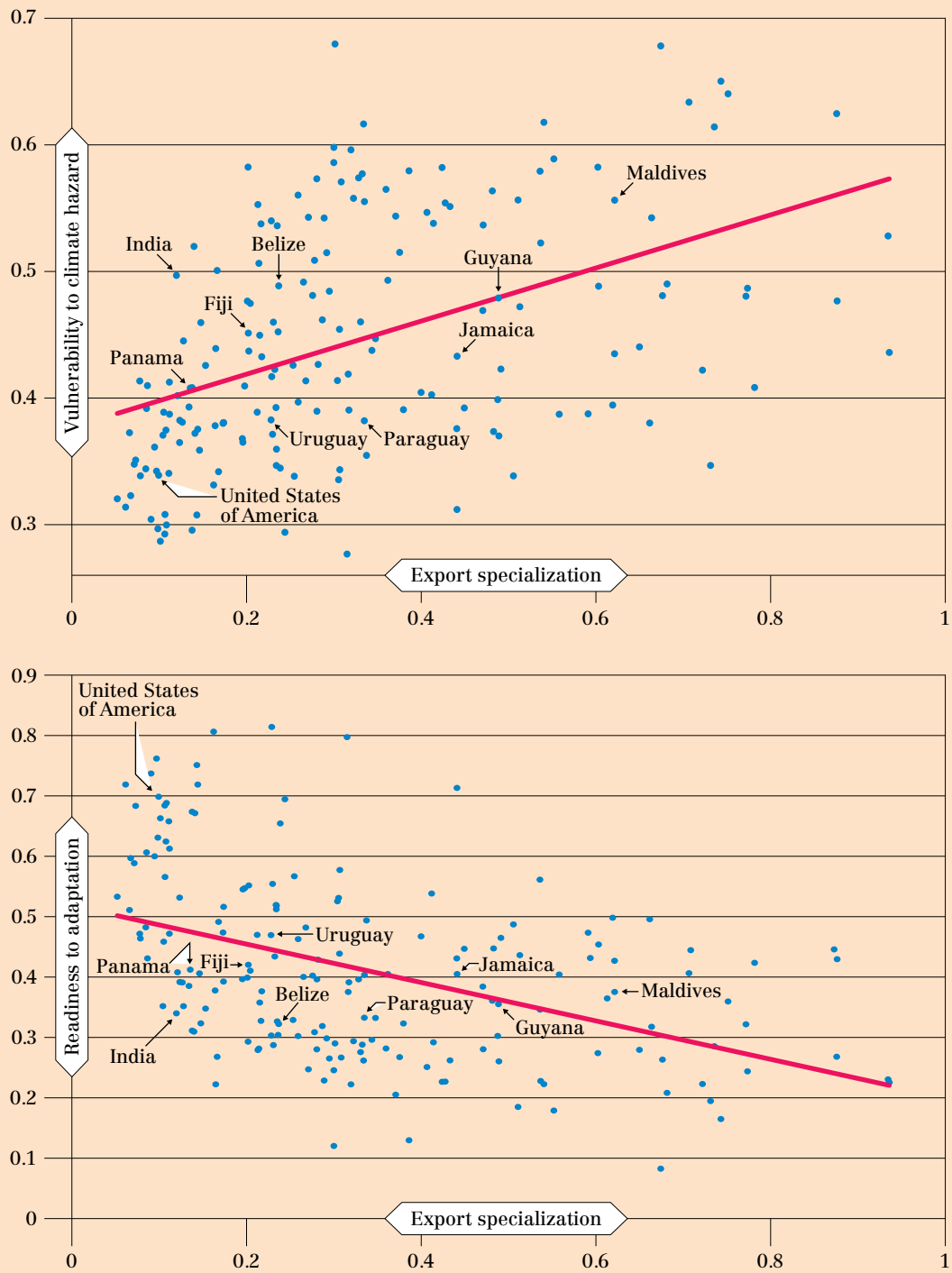
◆ **FIGURE 23** Summary of ND-GAIN vulnerability and readiness indicators



Source: ND-GAIN, 2019.

Figure 24 elaborates the correlation between vulnerability and export specialization in the economy (left panel), and readiness and export specialization (right panel) by plotting the data of 181 countries on a scatterplot. There is a positive correlation between specialization and vulnerability such that highly vulnerable countries have a high degree of export specialization. Moreover, higher readiness comes with lower levels of export specialization. Guyana’s economy already exposes relatively high dependence on exports. With the discoveries of oil this export dependency is expected to increase further. Future reforms should hence consider reducing the level of economic and natural vulnerability in Guyana.

FIGURE 24 Scatterplot: vulnerability, readiness and export specialization index



Source: Authors' elaboration based on data from UNSD, 2019 and ND-GAIN, 2019.

5 Competitive profile

KEY MESSAGES

- ◆ Guyana's current agricultural export basket particularly focuses on rice and, to a lesser extent, on fish (frozen, fresh, and dried), crustaceans, sugar and ethyl alcohol. Guyana's sophistication and dynamics in promoting a comparative advantage for rice, fish and ethyl alcohol bode well for development in Guyana.
- ◆ This report identified a set of commodities with high export potential; these share characteristics with the current export basket, implying that expanding exports to these goods will not be costly and should promote development. They include oil seeds, bovine meat, sunflower seed oil, fish flours (for animal feed), palm oil, fowl, cocoa beans, cocoa paste and sunflower seeds.
- ◆ Institutional challenges hampering Guyana's export and diversification perspectives include low credit levels, high tariff and non-tariff barriers, and difficulties for traders to receive permits.
- ◆ Intraregional trade within CARICOM presents an opportunity to boost trade and diversification but has not been used to the fullest extent, due to the lack of good sanitary and phytosanitary regimes.
- ◆ Changing consumption trends driven by supermarkets and fast food chains provide opportunities for Guyana's farmers, however, currently they cannot benefit from these trends due to a lack of quality and quantity standards and the inability to deliver their products in a timely manner.

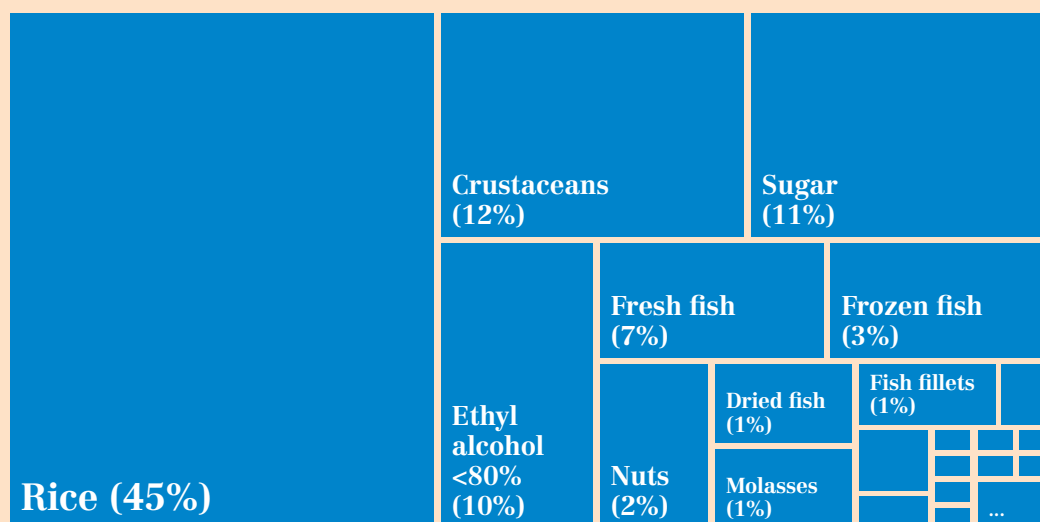
This section explores the competitive profile of Guyana's agricultural sector. The aim is to analyse existing export commodities to identify products with a positive outlook, to identify new products for diversification and export, and to discuss institutional arrangements that could improve Guyana's export potential. While the previous sections provided a broader picture by comparing Guyana to similar economies (Caribbean and MICs), this section focuses on comparing Guyana to other Caribbean nations, which have higher degree of similarity with Guyana, in particular with regards to the agricultural sector (FAO and CAB, 2019).

Figure 25 shows the composition of Guyana's current agricultural export basket at the four-digit level of the harmonized system (HS)²¹ in 2017 with data supplied by the Guyana Bureau of Statistics. The main commodity in Guyana's agricultural export basket is rice, which contributed 45 percent or roughly USD 200 million to Guyana's agricultural exports. The main exported subproducts include other white rice, other rice in the husk (paddy or rough), and semi-milled white rice. Crustaceans contribute 12 percent to the export basket, with frozen shrimps and prawns being the main contributors. Eleven percent of agricultural

²¹ The Harmonised System – also called the Harmonized Commodity Description and Coding System – is an international standardized system of product names and corresponding numeric codes to classify traded products between countries (UNSD, 2019).

exports come from the sugar industry with the most important subproduct being cane sugar. Ethyl alcohol (< 80 percent), also contributes 10 percent to the agricultural export basket; the main exported subproduct of ethyl alcohol is rum.

◆ **FIGURE 25** Export composition in Guyana, 2017



Source: GBoS, 2019.

5.1 Current agricultural export basket

To identify commodities from the current agricultural export basket with potential for expansion, we start with a comparative advantage analysis to reveal specialization patterns in Guyana’s agriculture sector, followed by an export sophistication analysis. The combination of the two analyses should reveal the agriculture and food commodities with a positive export outlook.

David Ricardo’s theory of comparative advantage and the Hecksher-Ohlin model of factor endowments relate trade to productivity. Product specialization and labour allocation are associated with initial levels of productivity. In a dynamic perspective, specialization patterns affect productivity growth and trade (Proudman and Redding, 2000). We looked at the evolution of comparative advantage to capture the distribution of relative production costs (relative productivity) in Guyana, and its evolution over time.

We estimated a normalized revealed comparative advantage index (NRCA) (Yu, Cai and Leung, 2009). The NRCA is comparable across commodity, country, and time and is formulated as follows:

$$NRCA_j^i \equiv \frac{\Delta E_j^i}{E} = \frac{E_j^i}{E} - \frac{E_j E^i}{EE}$$

Where:

- ◆ E_j^i is the export of product j of Guyana;
- ◆ E is the export of all commodities by all countries;
- ◆ E_j is the export of product j of Guyana;
- ◆ $E^i = \sum_j E_j^i$

The NRCA captures the degree of deviation of Guyana's actual export from its comparative advantage neutral level²² in terms of its relative scale with respect to the world export market, and thus provides an indication of the underlying comparative advantage. If $NRCA_j^i > 0$, then the actual export of commodity j is higher than its comparative advantage neutral level, which means that the country has a comparative advantage in producing this commodity compared to other countries.

◆ **TABLE 5** Normalized comparative advantage product groups (HS – four-digit level)

Code	Commodity	Ranking comparative advantage		Agrifood export share (%)		Δ Export share
		2017	2007	2017	2007	2017–2007
1006	Rice	1	2	45.4	15.5	29.9
306	Crustaceans	2	3	12.4	8.1	4.3
1701	Sugar	3	1	11.0	57.3	-46.3
2208	Ethyl alcohol < 80%	4	4	10.4	5.5	4.9
0302	Fish (fresh or chilled, excluding fillets)	5	7	6.6	1.7	5.0
0303	Fish; frozen, excluding fillets	6	14	3.5	0.3	3.2
0801	Nuts	7	35	2.5	0.0	2.4
0305	Fish (dried, salted or in brine)	8	10	1.6	0.5	1.1
1703	Molasses	9	8	1.4	0.8	0.6
0304	Fish fillets and other fish meat	10	6	1.1	3.1	-2.0

Note: Codes and Commodity definition are according to the harmonized system of the UN at the four-digit level.

Source: Authors' calculation based on data from the GBoS, 2019.

Table 5 shows the ranking of the ten agricultural and food commodities with the highest comparative advantage in 2017. Comparing the rankings in 2017 and 2007 allows us to analyse the dynamics of Guyana's comparative advantage. The most significant dynamics can be found in rice, which increased its share in total agrifood exports by almost 30 percentage points during this period. At the same time, the share of sugar exports fell by 46 percentage points. The change in rankings shown in Table 5 confirms the general state of Guyana's agricultural sector. Today, the sugar industry is in crisis due to the abandonment of preferential access to the European market and the resulting competition. The past and current importance of sugar is still visible; although the export share of sugar significantly decreased, sugar still ranks third after rice and crustaceans. This relative importance of sugar implies that a long-term, sustainable agenda to reform the sugar industry needs to be

²² $NRCA=0$ is defined as the normalized revealed comparative advantage neutral level in which a country's export of a product matches the world export share of the same product, i.e. the country has neither an advantage or disadvantage in exporting the product compared to the rest of the world (Yu, Cai and Leung, 2009).

designed and implemented in the upcoming years. This could, for example, entail reforms that contribute to easing the phasing out of sugar production and making Guyana's sugar industry more competitive.

The report uses methodology from Hausmann *et al.* (2007) to measure the quality of exports using an index for **export sophistication**. The index captures the implied productivity of exported commodities weighted by the income levels of countries producing them. The index is a weighted average of the per capita GDP of producer countries, with weights assigned by comparative advantage.

Sophistication may be measured at commodity level $PRODY_k$ and at country level $EXPY_j$:

$$PRODY_k = \sum_j \frac{\frac{X_{kj}}{X_j}}{\sum_j \left(\frac{X_{kj}}{X_j}\right)} Y_j$$

Where:

- ◆ X_{kj} represents the value of product k exported by country j ;
- ◆ X_j is the total value of exports of country j ;
- ◆ Y_j is the GDP per capita.²³

The product-level sophistication variable is used to measure the overall level of income associated with a country's export basket, which is the export sophistication level of country j during the year t . The index is the average of the $PRODY$ of all commodities that a country exports, weighted by its share of total exports:

$$EXPY_{jt} = \sum_k \frac{X_{kjt}}{X_{jt}} PRODY_k$$

Notwithstanding the fact that 'rich-countries' have a high level of sophistication and 'poor-countries' have a level of low sophistication by construction, countries with equal GDP per capita may have different levels of sophistication.

As discussed by Reis and Farole (2012), Hausmann *et al.* (2007) show that countries with high sophistication levels tend to have higher growth rates. Countries 'become' what they export by converging to the income level implied by their export baskets. This implies that focusing on commodities with high sophistication levels should increase income and promote development.

Lall *et al.* (2006) describe cases where high-technology commodities have low levels of sophistication, suggesting that some production processes can be fragmented, and thus parts of the process relocated to lower-wage countries. In addition, some low-technology commodities have high sophistication levels, suggesting that the products have specific requirements for natural resource or logistics, or are subject to policy interventions.

Table 6 presents Guyana's eight most sophisticated agrifood export commodities. These are mostly part of the fishing industry, but also include rice, sugar, and ethyl alcohol (rum).

²³ Gross national income per capita, purchasing power parity (current international \$) as measured by the World Bank are used to measure GDP per capita in this report.

◆ **TABLE 6** Highly sophisticated agrifood exported commodities

Code	Commodity	Sophistication ('000)
0303	Fish (frozen, excluding fillets)	62.71
0302	Fish (fresh or chilled, excluding fillets)	19.77
0304	Fish fillets	17.36
2208	Ethyl alcohol < 80%	16.73
0307	Molluscs	15.89
1701	Sugar	13.95
0306	Crustaceans	8.85
1006	Rice	6.48

Source: Authors' calculation based on data from the GBoS, 2019.

In a final step, we combined the results from the comparative advantage analysis and the export sophistication index. The idea is that a product with positive comparative advantage can be produced by Guyana at a low cost, which would allow it to be sold on the international market. A product with a high sophistication index, on the other hand, will increase income and promote development. In combination, a product with high sophistication index and a comparative advantage can be sold in the market and should promote development at the same time.

Six commodities with these characteristics are presented in Table 7. Three commodities with high sophistication level (Table 6) – sugar, molluscs and fish fillets – are not included because they have a negative trend in terms of their comparative advantage (see Table 5). The remaining six commodities share positive comparative advantage and high level of sophistication. Again, these feature many products from the fishing industry (frozen, fresh, dried fish and crustaceans) as well as rice and ethyl alcohol.

◆ **TABLE 7** Normalized comparative advantage product groups (HS – four-digit level)

Code	Commodity	Trade value (million USD)	Export share (%)	Sophistication ('000)	Comparative advantage ranking
0303	Fish (frozen, excluding fillets)	15.306	3.5	62.71	6
0302	Fish (fresh or chilled, excluding fillets)	29.188	6.6	19.77	5
2208	Ethyl alcohol < 80%	45.727	10.4	16.74	4
0306	Crustaceans	54.283	12.4	8.85	2
1006	Rice	199.331	45.4	6.48	1
0305	Fish (dried, salted or in brine)	7.053	1.6	6.04	8

Note: Values are for the year 2017.

Source: Authors' elaboration based on data from GBoS, 2019 and UN Comtrade, 2019.

The agricultural commodities presented above are currently exported and have a positive outlook for the future. Nevertheless, it should be noted that this is a purely macroeconomic analysis and the results should not be interpreted at face value. Rather, they should be seen as pointers to further analyses covering other important dimensions, such as microeconomic, environmental, social, territorial and agricultural dimensions for a better understanding of Guyana's overall export potential.

5.2 Potential future agricultural export basket

In this section, we conduct a proximity analysis on Guyana's current agricultural export basket to identify new products in which the country can invest to diversify the agricultural sector.

As Reis and Farole (2012) have emphasized, when studying the ingredients for diversification, it is critical to identify the capacities required for each economic activity, from labour-training and physical assets, to regulatory requirements, property rights and infrastructure (Hausmann and Klinger, 2007; Hidalgo *et al.*, 2007).

According to Reis and Farole (2012), exporting coffee requires different capacities (such as decent sanitary and phytosanitary regimes) than does producing synthetic apparel, but the capabilities needed for producing coffee are likely to be similar to those needed for bananas and plantains. Similarly, gold mining or extraction of forest products may require a higher level of property rights enforcement than, say, the assembly of electronic parts. The ease with which an economy can move to produce new exports depends on the capacities that are already in place. The hypothesis is that countries with competence in producing a certain good can redeploy their human skills, physical infrastructure and institutions more easily if they seek to produce goods that are 'nearby' products they are already producing (Reis and Farole, 2012).

To identify 'nearby' products, we constructed the entire product space of Guyana (see Annex 1), followed by an estimation of the distance to not-yet exported goods to discover which products are closest to Guyana's current agricultural export basket.

Following Fortunato *et al.* (2015), we used the methodology of Hausmann and Klinger (2007) to measure the probability of moving from a given set of commodities (the current export basket) to a new not-yet exported product h : *distance*. Distance is the conditional probability of exporting a new commodity h given the current export structure. If a commodity requires the same capacities as the current basket, then its export probability is high. Distance measures the capacities that are lacking to export commodity h . It is the sum of the proximities between a commodity and all the products that country j is not exporting, normalized by the sum of proximities between all products and product h . If Guyana exports most of the commodities nearby commodity h , then the distance is small. If Guyana exports a small proportion of the products that are related to product h , then the distance is large.

Mathematically, the distance between the export basket b and a new product h is measured as follows:

$$distance_{bh} = \frac{\sum_{k=1}^N (1 - M_{kh}) \varphi_{kh}}{\sum_{k=1}^N \varphi_{kh}}$$

Where $\{1, N\}$ denotes the entire product space and $M_{kh} = 1$ if Guyana exports product k with $NRCA > 0$ and 0 otherwise.

As a first step, we arranged all not-yet exported commodities into ten different groups (using quintiles) based on their distance from the agrifood export basket in Guyana for 2017.

Then, we measured the level of sophistication of the not-yet exported commodities and compared them with the average sophistication level of the current export basket.

The commodities with the highest sophistication levels are shown in Table 8. The table shows the distance of each commodity from the 2017 export basket and its level of sophistication. It depicts agricultural goods that Guyana is already mostly prepared to produce, thus raising the aggregated sophistication level of the country's exports; these include fish flours for animal feed, palm oil and sunflower seeds.

As noted above, Table 8 shows the potential for future product diversification from a purely macroeconomic perspective. These results should not be interpreted at face value. Rather, they should be seen as inviting further analysis of the microeconomic, environmental, social, territorial and agricultural dimensions of Guyana's export potential.²⁴

◆ **TABLE 8** Highly sophisticated agrifood commodities 'nearby' the current export basket

Distance rank	Commodity	Sophistication	Distance
1	Other oil seeds	1 055	0.46
2	Bovine	3 218	0.47
3	Sunflower seed oil	2 686	0.48
4	Fish flour for animal feed	10 931	0.48
5	Palm oil	4 396	0.48
6	Fowl	521	0.49
7	Sheep	795	0.50
8	Cocoa beans	9 767	0.51
9	Cocoa paste	581	0.52
10	Sunflower seeds	1 499	0.52

Source: Authors' calculation based on data from the GBoS, 2019.

The application of the concepts of product space and export sophistication allows us to identify the most promising commodities in the agrifood sector, given the productive capabilities already present in Guyana. Certainly, it is not an easy task to make Guyana's agrifood export basket more sophisticated. Our methodology selects new commodities on the basis of their distance from the current export basket. Comparing the aggregated sophistication level of Guyana's agrifood exports with the level that apparently could be reached raises an important question: what has prevented Guyana from developing a productive export structure that is closer to the one identified by the empirical results?

There are many possible explanations. The low rates of transformation could relate to domestic factors, such as local barriers to new activities (for example, underdevelopment of the financial sector or scarce links with emerging sectors, quality of government, and infrastructure), as well as to the global macroeconomic context (such as adverse terms-of-trade movements, exchange rates, etc.). In order to analyse the relative importance of the domestic factors, the next chapter explores the constraints to structural transformation more deeply.

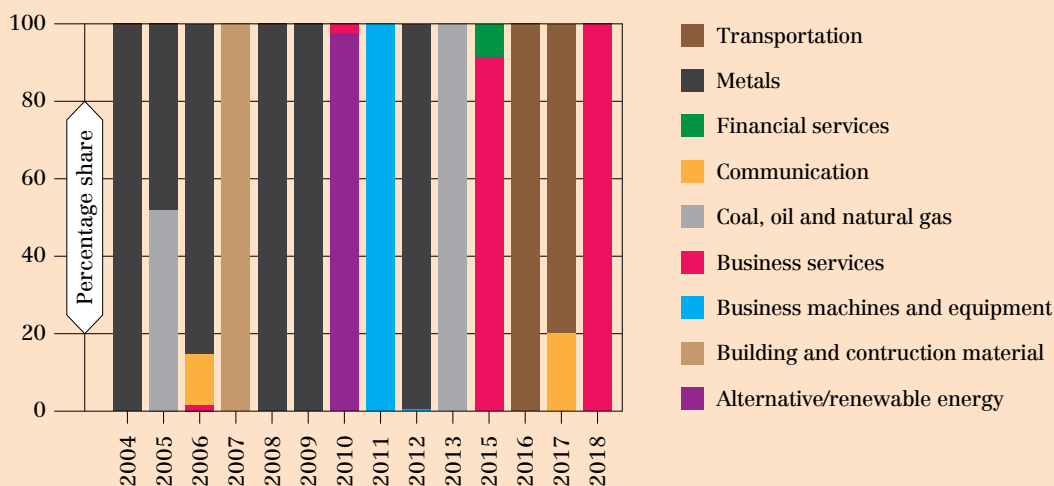
²⁴ For example, an agronomist would immediately point out that producing sheep in a tropical climate is difficult and thus would not be a feasible investment.

5.3 Investments in the food industry, the supermarket revolution and fast food chains

In the developing world, investments – both foreign and domestic – in the food value chain have increased significantly over the past two decades. The Caribbean has received some of the highest levels of foreign direct investment (FDI) in the world,²⁵ with many economies having reported FDI to GDP ratios above 10 percent in 2012 (De Groot and Ludena, 2014). Most FDI in Guyana goes to crop production (mainly cereals and sugar cane) rather than to the food-processing sector. Recent major foreign land acquisitions in Guyana, for example, have primarily been driven by the forestry sector, which has shown promising economic returns. Ethnical and cultural reasons may have played a role in these investments, as investors are Indian firms with possible close ties to Guyanese of Indian descent (Land Matrix, n.d.).

Green field investments (GFI) are an area of rapid investment growth in the Caribbean. These are a type of foreign direct investment where a parent company creates a subsidiary in a different country, building its operations from the ground up. Between 2003–2018, most GFI investments in the agribusiness sector were concentrated in Caribbean states with large populations (Haiti, Jamaica, Trinidad and Tobago) and a high agricultural share of GDP (Belize, Suriname). While Guyana’s agrifood sector has not been a GFI destination, (see Figure 26), other types of FDI still enter the country’s agricultural sector (Figure 27) and in recent years FDI increased significantly in Guyana’s agricultural sector (see Figure 28). Given the preliminary commodity groups identified in our analysis, such investments may be of interest for supporting the country’s diversification strategy. In particular, GFI funds may be beneficial in the fishing and forestry sectors, which show a positive trend and require large capital investments to expand.

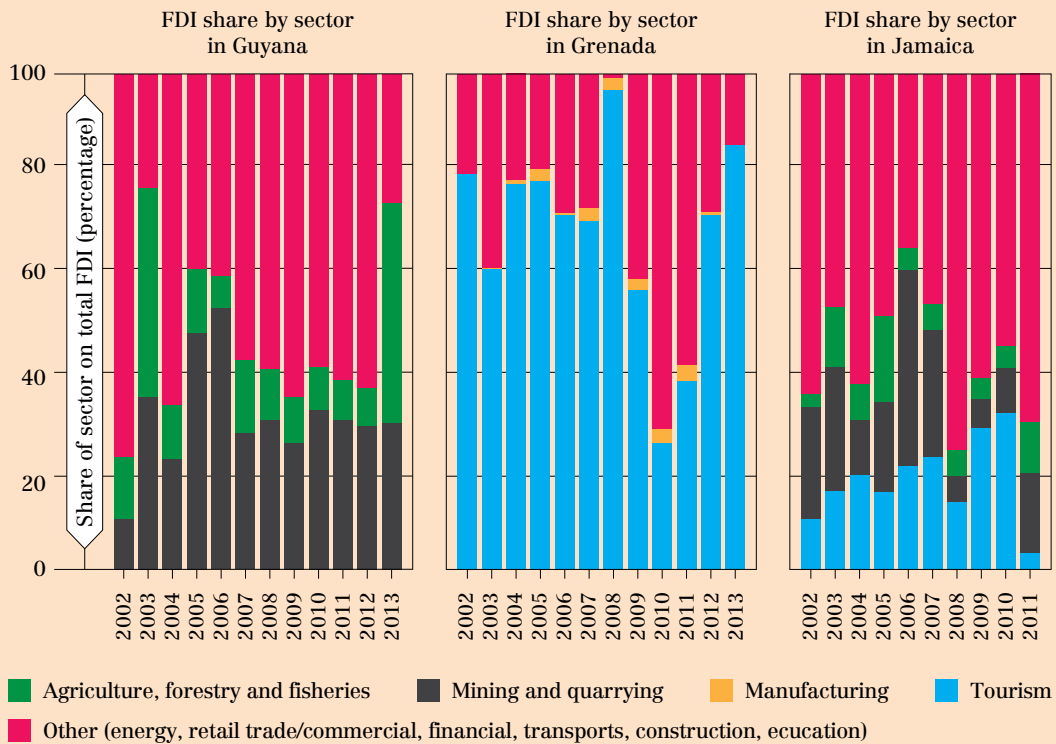
◆ **FIGURE 26 Greenfield investments in Guyana by sector**



Source: Authors’ elaboration based on data from fDi markets, 2019.

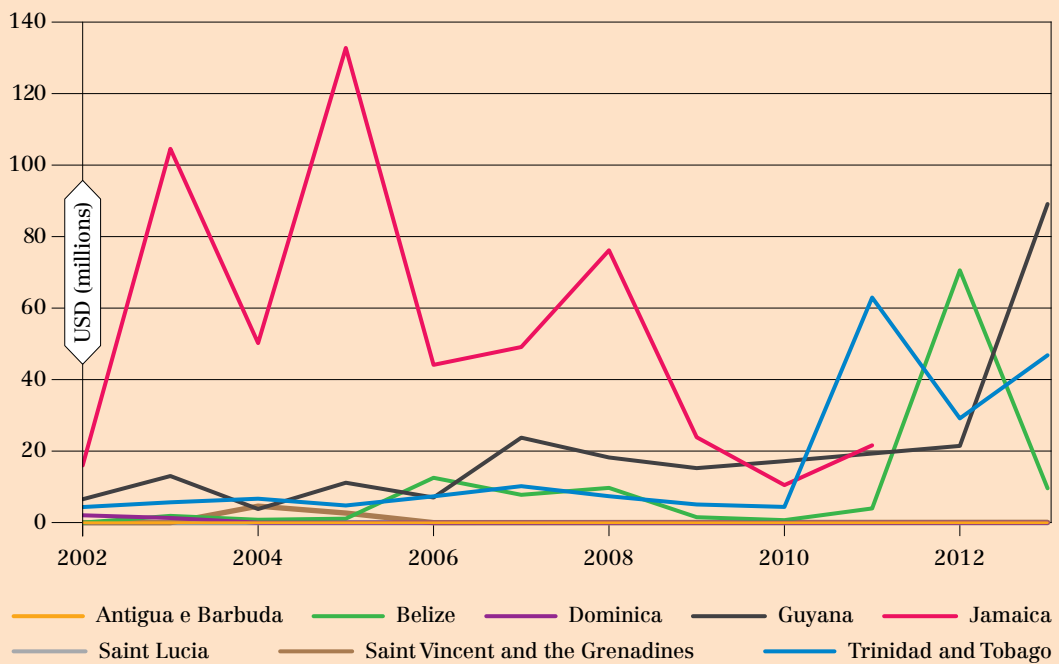
²⁵ There is a great deal of economics literature on the relationship between foreign direct investments and economic growth, considering especially the determinants of growth, the determinants of FDI, the role of multinational companies in the recipient economies and the direction of causality between FDI and growth (Chowdhury and Mavrotas, 2006). Endogenous growth theory emphasizes impact on economic growth through capital, technological and knowledge diffusion (De Mello, 1999; Blomstrom, Lipsey and Zejan, 1996; Borenzstein, De Gregorio and Lee, 1998). Several studies on agrifood value chains have documented the important impact that FDI in agrifood chains can have on the development of local agriculture (Gow and Swinnen, 1998; Dries and Swinnen, 2004, 2010; Maertens et al., 2012).

◆ **FIGURE 27 FDI inflows by sector in Grenada, Guyana and Jamaica**



Source: Authors' elaboration based on data from De Groot and Ludeña, 2014.

◆ **FIGURE 28 Agriculture, fishing and forestry FDI in Guyana and selected countries**



Note: Values are in constant 2010 US dollars.

Source: Authors' elaboration based on data from CARICOM, 2019.

The food retail sector in developing and emerging countries has attracted the largest share of foreign investment. This has been called the 'supermarket revolution' because the most dramatic investments were at the retail level, but large investments have also affected the food processing and wholesale stages of the value chains (Reardon *et al.*, 2003, 2009; Swinnen, 2017). Many studies have shown that these downstream investments in the value chain can have important implications for local agriculture and food consumers.

While data is scarce, available information suggests that a similar process is taking place in Guyana. Based on discussions with some supermarket operators, Iton (2009) found that the importance of supermarkets in the Caribbean has been increasing. This has changed the diets and consumption basket of food consumers significantly. The traditional diet in Guyana was mainly composed of roots and tubers produced primarily on local farms, with the surplus sold on the market (Iton, 2009). Today, many other products are available, such as fruits, vegetables and microwaveable meals, with a large percentage being imported.

The increasing importance of supermarkets has created challenges and opportunities for local farmers, particularly when they actively participate in the supply chain (Iton, 2009). Some of the most common challenges include supplying – on a timely basis – an adequate volume of product that satisfies strict quality standards and food safety requirements. An important aspect of the literature on value chains considers the importance of institutions for agrifood value chain development. In particular, the role of institutions is analysed by studying the routines that govern compliance with food safety standards, or the mechanisms that control access to formal agricultural output markets, such as supermarkets or the fast food industry.

Small agricultural producers and producers that are not members of farmers' organizations in the region commonly find it difficult to access formal commercialization channels. This may be due to a lack of compliance with food safety regulations and or good agricultural practices, missing capacity to respond to the quantity and timing requirements of supermarkets or large traders, or it may simply be a result of missing linkages to communication channels and marketing networks. As a result, agricultural households may remain disconnected from national input and output markets, alienating them from more profitable value chains.

Despite these constraints, Guyana does offer opportunities for local farmers. One example is in the livestock sector. Guyana produces cattle and pig meat, and there is sufficient knowledge available in the country to foster cattle breeding, meat production and export. Although the country is self-sufficient in meat production, it imports meat due to a misalignment between the quality standards of local suppliers and those required by the fast-food industry and other internationally aligned sectors. In response, the Government of Guyana recently launched the Sustainable Agricultural Development Program (SADP), which supports compliance with sanitary and phytosanitary standards (SPS). Under this programme, a state-of-the-art abattoir will be built, thus enabling the country to meet international food safety and quality standards. In addition, Guyana's Minister of Agriculture and Finance has engaged with the Inter-American Development Bank in order to review the standards and codes related to products with potential export markets.

Improving links with modern food value chains, whether for local food processors and/or the retail sector, should be a major focus of future investments strategies. A number of empirical studies show that such value chain development strategies can have important spillover effects at the farm level, particularly in vertically-coordinated value chains (Swinnen and Kuijpers, forthcoming; Dries and Swinnen, 2010). This can enhance productivity, the quality and safety of agricultural raw materials, improve access to markets, and promote transfers of technology and expertise to farmers. Value-chain finance mechanisms may also contribute to lower credit constraints for farmers (Townsend *et al.*, 2018).

5.4 Tourism and agriculture

Tourism represents an important sector, which has attracted a major share of FDI in the Caribbean, around 30 percent over the past 15 years. The main destination for tourism-related FDI has been small and large island states, making up around 50 percent of average FDI in the small island states. Compared to other Caribbean countries, the tourism sector in Guyana represents a small percentage of GDP and attracts very little FDI (see Figure 29).

A web of relationships joins the tourism industry and the agrifood system in the Caribbean. The influx of foreign tourists has increased local demand for food, and for specific food products. This has affected both trade and local production. With increased tourism, food imports have increased in several Caribbean economies (Caribbean Community, 2010; Gonzalez, 2011). In Guyana, the lack of diversity in food production has stimulated imports of products demanded by the tourism sector (Singh, 2006).

The growth in tourism in the Caribbean has also created opportunities for local farmers because it has stimulated demand for high-value food products. Many scholars expected local agricultural production to expand and diversify to meet tourist demand. However, studies suggest that such links between local agricultural production and tourism have not materialized (Rhiney *et al.*, 2015). The lack of a supply response from Guyana’s agricultural sector to increased food demand from tourism can be traced to many factors, including small farm size and natural disasters that keep investments low; limited water supply and irrigation development; low productivity; limited trade competitiveness; short supply of skilled human labour; and phytosanitary issues (Jansen *et al.*, 2015). These constraints have actually increased the levels of food imports.

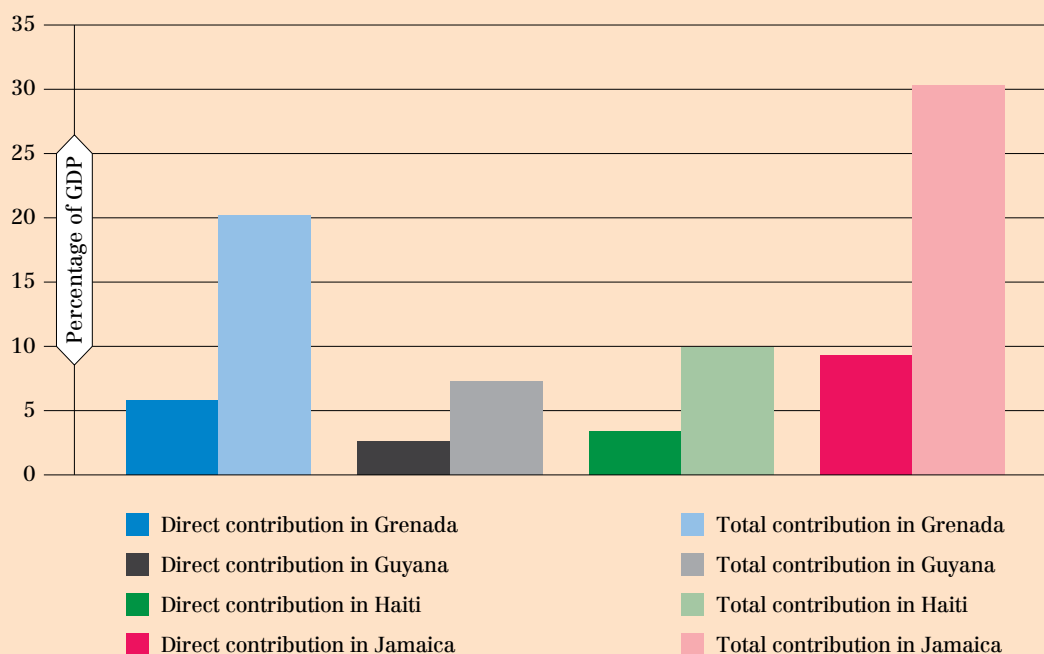
Caribbean hotel representatives interviewed by the World Bank explained that ensuring a consistent supply of locally grown produce is especially challenging during the dry season – from mid-December to mid-April – which happens to coincide with the high tourist season. This is exactly the period when local agricultural production drops in the absence of intensive irrigation. The main strategy used by the larger hotels to mitigate local food supply shortages has been to rely on food imports, or to purchase from importers such as traders and wholesalers or supermarkets and marketing boards in the case of smaller hotels (Jansen *et al.*, 2015).

5.5 Quality of government

The World Bank produces ‘ease of doing business indicators,’ which capture the multidimensionality of the quality of government and the ease for businesses to deal with government bureaucracy. Figure 30 compares Guyana’s ease of business indicators with those of the selected country groups. Doing business in Guyana can be difficult, especially when dealing with construction permits, resolving insolvency, and trading across borders.

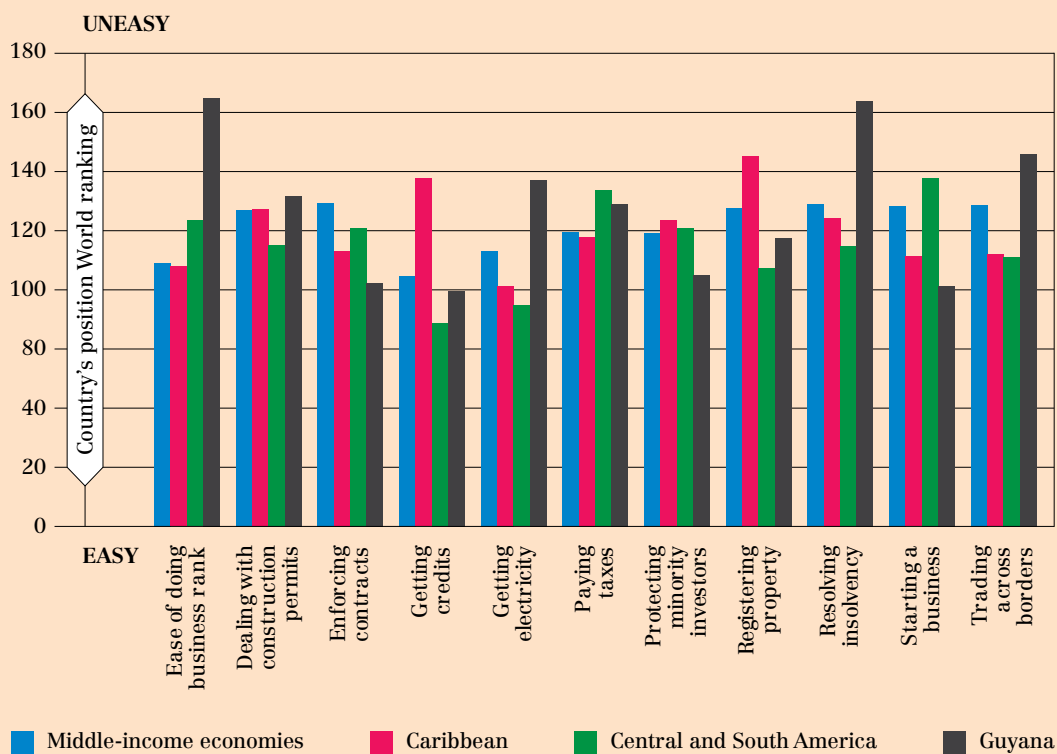
Many studies underline the importance of government quality in agriculture and food product development. DaSilva and Hosein (2018) reported the results of a survey conducted among exporters of food and agriculture products in Guyana. The results suggest that the “exports are hindered not so much by the technical requirements of export markets, but rather by the institutional inefficiencies that prevail in local agencies that play a role in the export process, particularly as it relates to obtaining certification and undergoing inspection (DaSilva and Hosein, 2018).”

FIGURE 29 Economic impact of tourism in Guyana and selected Caribbean countries



Source: Authors' elaboration based on data from the WTTC, 2019.

FIGURE 30 Ease of doing business in Guyana and in selected country groups



Source: Authors' elaboration based on data from World Bank, 2019.

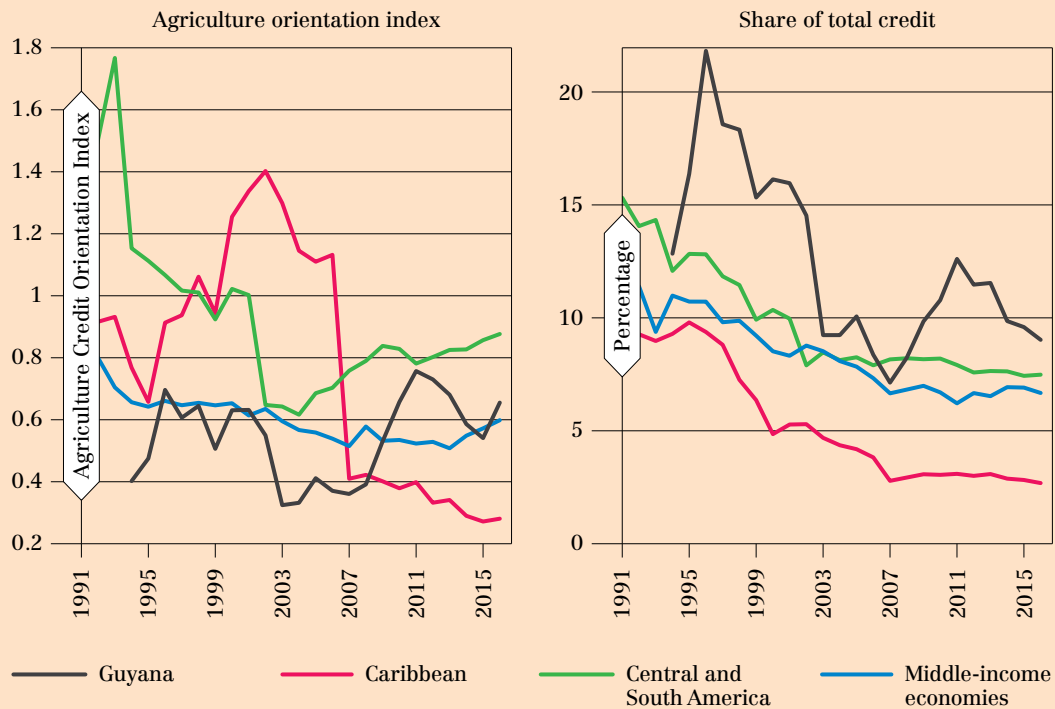
5.6 Access to credit

Access to credit is fundamental for growth and business development in the agricultural sector. Lack of credit is particularly problematic for farmers, since they face a time lag between investment and the sale of livestock and crop products. The agricultural sector is generally under-represented in commercial lending as compared to other sectors: while globally agriculture contributes over 4 percent of GDP, agriculture receives only 3 percent of total credit from domestic commercial banks (FAO, 2019).

The Agriculture Credit Orientation Index (ACOI) measures the relative importance that commercial banks place on providing credit to the agricultural sector. The ACOI is the share of credit provided to agriculture over the share of agriculture in GDP (FAO, 2018). In other words, it normalizes the share of credit provided to agriculture by taking into account the economic contribution of the sector. An index value of less than 1 means that the agriculture sector receives a lower share of credit compared to its GDP share, while an index value greater than 1 indicates that the sector receives a higher share of credit compared to its economic contribution.

A general reduction in the indicator has been observed across the Caribbean (see Figure 31), with a rapid fall in 2007. The large variability of the index is the result of the declining contribution of the agricultural sector to the economy, especially in small island states where any small change produces a large variation in the index. By contrast, since 2007 Guyana has recorded a higher ACOI than the average in the Caribbean and middle-income countries. However, Guyana's ACOI has been consistently lower than in Central and South America. Moreover, the country's ACOI never surpassed a ratio of one during the period from 1993 to 2016. This means that the sector receives a lower share of credit compared to its economic contribution.

◆ **FIGURE 31** Indicators of credit in agriculture



Source: Authors' elaboration based on data from FAO, 2018.

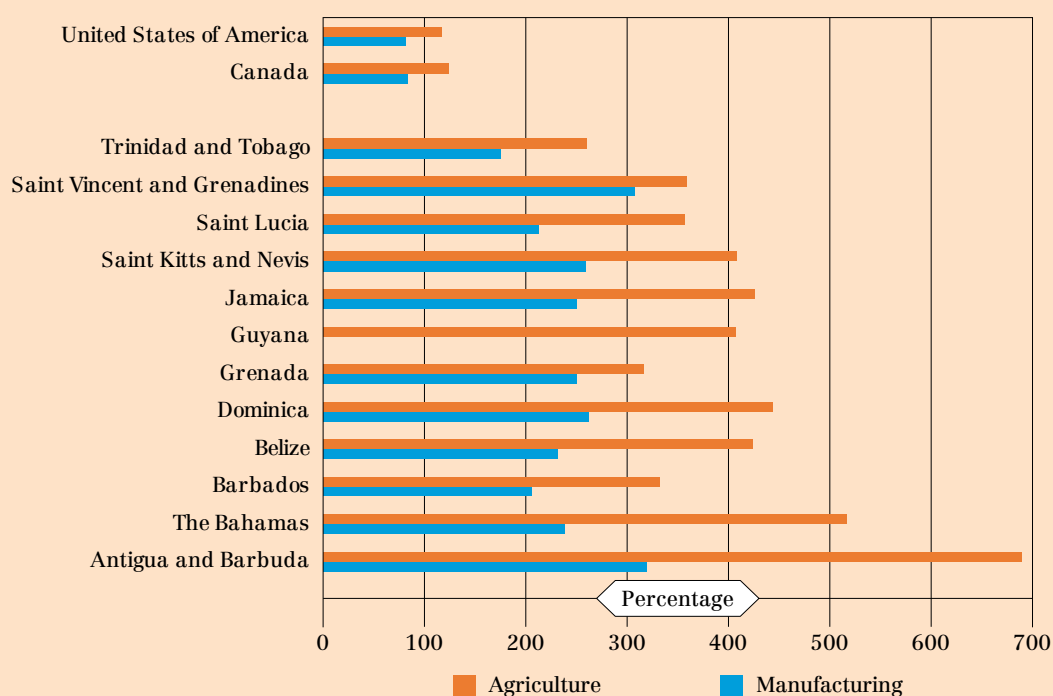
5.7 Barriers to trade

Guyana's external trade policies are coordinated with CARICOM (as outlined in the Revisited Treaty of Chaguaramas), which are harmonized with WTO regulations. Additionally, Guyana has many trade agreements with other countries and regions, all of which set their own particular conditions. Different measures are applied to imported and exported agricultural products or food, with considerable impact on the national economy.

The integration of Guyana in international trading systems is constrained by very high trade costs. The ESCAP-World Bank Trade Costs Database provides a description of the bilateral trade costs experienced by some Caribbean countries (Arvis *et al.*, 2013) (see Figure 32). This dataset comprises all the aspects that can cause friction between producer prices in exporting countries and consumer prices in importing countries. In particular, it includes elements such as tariff and non-tariff barriers, regulatory measures, differences in cultural and legal institutions, standards, and geographical and historical factors. Based on bilateral data, average trade costs can be computed as in Arvis *et al.* (2013). For the sake of comparison, the USA and Canada are included in the calculation because of geographical proximity and importance in international markets.

In the agricultural sector, trade costs in the Caribbean are between two and almost six times higher than in the USA and Canada. It is important to note that trade costs in agriculture are higher than trade costs for manufacturing. This phenomenon is valid in countries around the world. One explanation is that, relative to the manufacturing sector, markets for primary goods and processed foods are exposed to different tariff and non-tariff barriers, as well as product standards. Such barriers can have negative consequences for small developing countries like the Caribbean states.

◆ **FIGURE 32 Trade costs in agriculture and manufacturing for selected countries (2012)**



Source: Arvis *et al.*, 2013.

It is clear that a range of challenges must be overcome to foster trade in the region. A comprehensive review of studies on this topic can be found in the most recent report of BFSL (2017). The report includes recommendations for Caribbean countries as a whole, including Guyana, aiming to facilitate and increase trade both within the region and with countries outside of the Caribbean.

The challenges include unsatisfactory infrastructure, such as roads, electricity, ports, and storage conditions, and the need for more qualified technical staff. Often, these challenges can be addressed by public and private stakeholders. Many studies reported that non-tariff measures (NTMs) and non-tariff barriers (NTBs) need to be settled in accordance with CARICOM. Three different categories of NTMs/NTBs are found in the region. The first includes barriers imposed on **imports** as quantitative restrictions such as quotas, prohibitions, licensing, custom and administrative fees. The second are measures imposed on exports and include taxes, restrictions or quotas, subsidies, prohibitions and voluntary **export** restraints. Those two types of measures are applied at the border. The third category of NTMs/NTBs includes **actions or legislation applied internally** in the domestic economy that potentially can distort trade, these include environmental, labor, and health legislation; taxes or subsidies; technical standards; sanitary and phytosanitary standards; and outdated laws. All of these measures are potential or real obstacles to agricultural trade, particularly for small-scale operators.

According to BFSL (2017), WTO has adopted a minimalist approach to the treatment of NTMs/NTBs, leaving a wide space for restrictions and complaints. This opens the door for CARICOM member states to pursue the elimination of those obstacles, enhancing intra-regional trade but at the same time qualifying countries to join the global market.

Quantitative restrictions are reported to have been significantly reduced over the past decade, with sanitary and phytosanitary and health standards remaining the major obstacles.

The BFSL (2017) report also analysed international experiences of trade facilitation in other regional agreements and compared them to the experiences of Caribbean countries, including Guyana. The report made a number of recommendations:

1. Develop a flexible and effective rules-based framework to address sanitary and phytosanitary concerns. Furthermore, the Council for Trade and Economic Development (COTED) of CARICOM should have a more prominent and effective role in dealing with such disputes.
2. Adopt an approach to harmonize trade standards but maintaining the principle "One region, one requirement, one method of adoption accepted everywhere" (BFSL, 2017).
3. Develop Infrastructure for quality assurance.
4. Implement a regional impact assessment regime to ascertain the impact of the new regulations on the internal markets.
5. Establish a modality of notification of non-tariff barriers and non-tariffs measures on trade in CARICOM.
6. Increase and improve interagency cooperation.
7. Review and analyse legislation that can potentially affect trade.

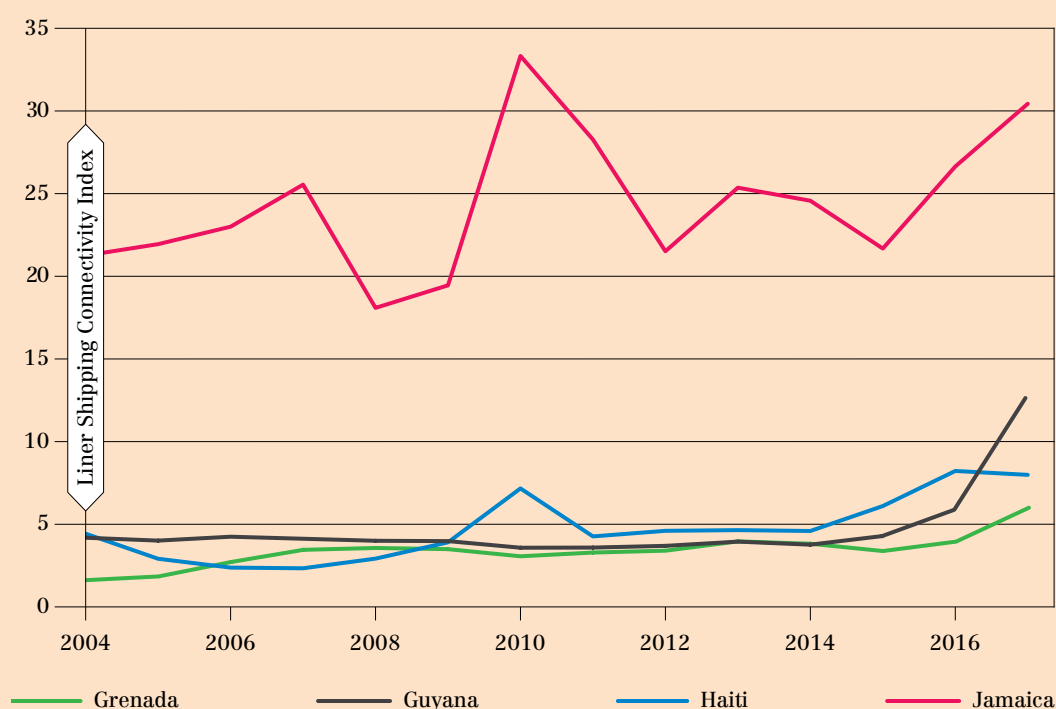
These recommendations are presented in detail in the BFSL report and should certainly be considered for a higher political level decision since their implementation will require an interministerial and multilevel approach. Task forces should be appointed to coordinate and initiate the actions called for in the recommendations.

The BFSL (2017) report outlines the political frictions affecting trade. Another dimension to consider is the physical dimension. Distance has often determined trade barriers by

influencing transport costs (freight rates); this is not the case for the Caribbean. Instead, the key physical trade barriers are liner shipping connectivity and port efficiency (Sanchez *et al.*, 2003; Sanchez and Wilmsmeier, 2010; Wilmsmeier and Hoffman, 2008). Indeed, McLean *et al.* (2017) describe the general agreement in the private sector that deficient economic infrastructure, such as ports, freight logistics, internal, maritime and air transport and communications networks, in Belize, Suriname, and Trinidad and Tobago, are one of the principal barriers to fostering export diversification and redressing supply-side capacity constraints.

Figure 33 shows the Liner Shipping Connectivity Index (LSCI) for Guyana and some of its Caribbean neighbours.²⁶ Despite a small but significant improvement, Caribbean countries – including Guyana – have a relatively low LSCI. The exception is Jamaica; where ports seem to provide the required cargo services efficiently. Kingston is eighth in the ranking of the Central and South American top ports and first in the Caribbean (World Container Traffic Data, 2017).²⁷

◆ **FIGURE 33** Liner Shipping Connectivity Index in Guyana and selected countries



Source: Authors' elaboration based on data from UNSD, 2019.

²⁶ The LSCI measures a country's level of integration into the existing liner shipping network. It is based on five components of the maritime transport sector: number of ships, their container-carrying capacity, maximum vessel size, number of services, and number of companies that deploy container ships in a country's ports. A country's value is divided by the maximum value of each component in 2004, the five components are averaged for each country, and the average is divided by the maximum average for 2004 and multiplied by 100. The index generates a value of 100 for the country with the highest average index in 2004. The indicator was developed by UNCTAD, Division on Technology and Logistics, Division on International Trade in Goods and Services, and Commodities and is based on data from Containerization International Online (www.ci-online.co.uk) and Lloyd's List Intelligence.

²⁷ See www.iaphworldports.org/statistics

6 Conclusions

Guyana and its agricultural sector are at a critical point in time, as they are facing three substantial challenges:

1. Recent large-scale, off-shore oil discoveries are expected to start generating substantial financial windfalls in 2020. These revenues will affect labour, prices and the competitiveness of non-oil sectors.
2. Guyana's coastal area, which is home to the majority of its population and agricultural activities, is at risk due to climate change and rising sea levels.
3. The loss of preferential access to the EU market resulted in a crisis of Guyana's sugar industry, triggering declining production rates and major adjustments within the sector, which was historically Guyana's most important industry.

This structural change caused a significant drop in the importance of agriculture to the Guyanese economy. Agriculture's share of the economy shrank from nearly 40 percent in the 1990s to less than 16 percent in 2016. Despite these changes, the economic value generated by the agricultural sector still depends on primary crop production, particularly of rice, sugar and forestry products. As highlighted in our report, this presents particular challenges for the country, which is particularly vulnerable to economic and climate shocks. Climate change and exogenous factors will put further pressure on the agricultural sector, particularly in rural areas where low productivity and soil degradation threaten incomes and employment. Yet, the financial windfalls from oil production put Guyana in a favourable position to tackle the risks of each challenge through smart investments in reforms and holistic sector development, ultimately promoting inclusive and sustainable growth.

In response to these challenges, the Government of Guyana has already launched several initiatives to strengthen the agricultural sector and generate growth. In particular, diversification in Guyana's agriculture sector is promoted through the Agriculture Export Diversification Program (AEDP), which was designed to promote exports, particularly of the 4Ps (peppers, plantains, pineapples and pumpkin) and the 4Cs (coconut, citrus, cassava and carrots). The government also has started to divest and privatize the Guyana Sugar Corporation's assets. This process will make new lands available for diversified agricultural production. Yet, institutional changes, including new legislation, will be required for the privatization process to enable equal and fair access to newly available farm land. Ideally, this process involves all relevant institutional stakeholders, such as the Ministry of Agriculture and the Ministry of Finance. Diversification will require a coordinated effort across all government to provide the necessary financial resources, productive and social infrastructures, and mobilization of the population to new areas.

Any effort to diversify the agricultural sector should be balanced and focus on the whole value chain, not just the primary output of the chain. Value chain development policies and programmes can enable a country to fulfil local, regional, and international demands for high-value agrifood produce. Importantly, this involves improving the environment in which farmers and agribusinesses operate to enable them to meet this demand locally. Policies are needed to stimulate FDI, improve the investment climate, ensure macroeconomic stability, and support general infrastructural investments such as in port facilities and national food safety systems. To meet private sector standards, value chain-specific investments will be required, including extension and certification services, capacity building for farmer associations, and support for infrastructural improvement, for example in cold storage and transport and irrigation for the agricultural sector.

One of the main weakness identified in our report is the lack of development of key institutions for the agricultural sector. Guyana does not have a strong institutional capacity to meet private or international sanitary and phytosanitary standards or food safety requirements, which are often needed to access high-value markets, both locally and internationally. Our analysis finds that exporting from Guyana can be costly, given the amount of time it takes to ship products from local ports, and this makes Guyanese products less competitive. Addressing shipment time and delays is particularly important for accessing the global agrifood value chain. Djankov, Freund, and Pham (2010) found that each additional day that a shipment is delayed is equivalent to a country distancing itself from its trading partners by one percent (or about 70 km). They also have shown that, in the case of perishable products, such as fruits and vegetables, the effect of time delays are even more severe, making it impossible in some cases to export agricultural products from certain countries.

This report has identified commodities that might provide a basis for greater product diversification. These include oil seeds (including sunflower), bovine meat, fish flours, palm oil, cocoa products, and aquaculture products, including fresh fish and fish meat. We believe that these commodity sectors can make use of existing export capacity and value chain infrastructure, both physical and institutional. Our analysis is very preliminary, and both agronomic suitability and a full value chain analysis is needed to definitively identify the most promising commodity sectors. One sector where the country has a clear comparative advantage in the Caribbean is meat production. Guyana already produces cattle and pig meat, and there is sufficient knowledge available to foster cattle breeding, meat production, and export. Even though the country is self-sufficient in meat production, it imports meat due to a misalignment between quality standards for local production and those required by the fast-food industry and other international buyers. It is not obvious where these inefficiencies are coming from. Therefore, it is recommended to conduct further in-depth analysis to identify the reasons and to get a better understanding of the problem. This analysis should then be used to formulate a strategy to tackle the inefficiencies.

The relative importance of sugar implies that a long-term, sustainable agenda to reform the sugar industry needs to be found and implemented in the upcoming years. This could, for example, entail reforms that contribute to making Guyana's sugar industry more competitive relative to its main competitors, e.g. by promoting technology adoption and by reversing the declining trend in sugar cane yields. Alternatively, reforms could focus on easing the phasing out of sugar production, by focussing on inclusive land reforms that enable equal access state-owned arable land used for sugar production and by promoting the adopting of crops that have a high potential for export markets. Reforms could comprise incentives for agricultural diversification; investments in agricultural technology adoption; investments in infrastructure and sanitary and phytosanitary measures that enable farmers to gain access to supermarket value chains and high-end export markets; capacity building for improved agricultural practices and the facilitation of access to credit.

Integrated value chain development programmes can assist farmers to access high value chains. Different approaches are possible, but all require close collaboration with major companies in the respective value chains. One approach might be to provide concessional loans or subsidies (e.g. as part of public-private partnerships) to hotel and restaurant chains to help develop the domestic value chain from which they can source their produce for the high value tourist sector. This typically would include providing training and technology transfer to farmers to help them comply with public and private standards for quality, quantity, safety, and reliability.

There is a need to stimulate intra-regional cooperation on trade. Many Caribbean countries have a comparative advantage in the same agricultural commodities. The creation

of a solid competitive/cooperative network of local enterprises and promotion of favourable institutional conditions may foster economies of scale and can attract foreign direct investment. In particular, the production of land-intensive products can be outsourced to countries with abundant land, such as Guyana. However, this does require trade cooperation among the Caribbean nations to reduce market distortions

Promoting a sustainable diversification strategy and value chain development will require significant financial resources. Guyana is poised to become an important exporter of energy products, including oil and gas, which will bring a significant amount of foreign exchange to the country and generate rapid economic growth. However, if this income is used to finance consumption, instead of investment in the transformation of the agricultural sector, the country may become even more economically vulnerable and dependent on food imports. Countries like Norway, and more recently Saudi Arabia, have used their vast income from energy sales to create sovereign funds to finance investments, which seek to diversify their economies to make them more resilient to exogenous market shocks. The lessons learned in these countries could be used to reinforce the initiatives already put in place by the Guyanese Government.



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Annex Further explanation

Guyana's product space

This Annex explains the product space methodology from Hausmann and Klinger (2007). Guyana's product space is presented in Figure A1.

Using the comparative advantage measure as a proxy for a country's effectiveness in exporting a commodity, Hausmann and Klinger (2007) define the proximity between commodity k and h as:

$$\varphi_{kh} = \min \{P(NRCA_k > 0 \mid NRCA_h > 0), P(NRCA_h > 0 \mid NRCA_k > 0)\}$$

Where $P(NRCA_k > 0 \mid NRCA_h > 0)$ is defined as the probability that a country exports commodity k with a positive comparative advantage, given that it also exports commodity h with a positive comparative advantage. More specifically, proximity is calculated by comparing how many countries that export product k with a positive comparative advantage also export product h with a positive comparative advantage. For example, if ten countries export product k with $NRCA > 0$, and 5 of those 10 countries also export product h with $NRCA > 0$, then the *proximity* (or the general probability to export) for product k in relation to product h is 0.5 (Fortunato *et al.*, 2015).

Guyana and its agricultural sector are facing three substantial challenges. Recent off-shore oil discoveries are expected to induce an immense inflow of revenues starting in 2020 which are likely to affect labor, prices and the competitiveness of the agricultural sector. Guyana's coastal area, which is home to the majority of its population and agricultural activities, is at risk due to rising sea levels. Lastly, the loss of preferential access to the European Union market resulted in a crisis of the sugar industry and triggered a restructuring of the agricultural sector. To identify the structural changes in Guyana's economy and agricultural sector and their consequences for productive, commercial and economic performance, the FAO project "Foster efficient, inclusive and sustainable food systems in support of agricultural diversification in Guyana" conducted a series of analyses. The present publication examines Guyana's export basket, vulnerabilities and export diversification potential. It further identifies variables that influence agricultural demand, changes in the pattern of food consumption and the exploitation of new regional markets. It raises institutional issues such as insufficient credit, trade barriers and administrative and bureaucratic difficulties and, finally, proposes steps for addressing Guyana's agricultural challenges.

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