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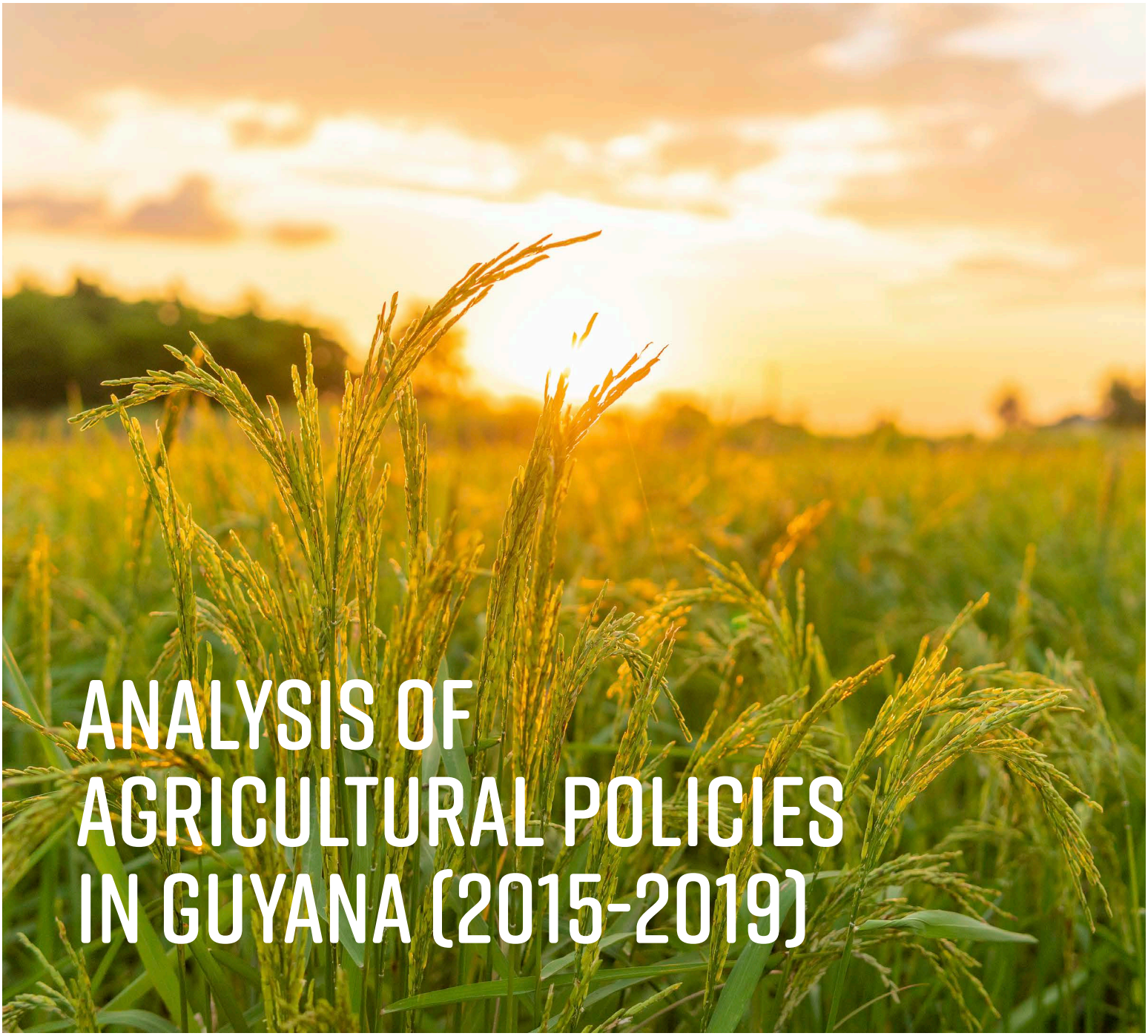

ANALYSIS OF AGRICULTURAL POLICIES IN GUYANA (2015-2019)

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ABSTRACT

The agricultural sector plays a crucial role in Guyana´s economic development by contributing 21.15% of gross domestic product (GDP). However, the share of the agricultural sector has been gradually decreasing over the years. This monograph offers an update of the OCDE´s Producer Support Estimate (PSE) methodology applied to Guyana for 2015-2019. The PSE approach focuses on two main elements of support: (i) the effect of government policy on prices received by agricultural producers, and (ii) the support provided through budgetary transfers to the sector. The market price support (MPS) remained Guyana's main PSE component. Expressed as a share of the total PSE, Guyana's MPS averaged 59% between 2015 and 2018. Following the end of Government transfers to GuySuCo in 2019, which led to a sharp decline in budget transfers to the agricultural sector, it rose to 96%. The main driver of Guyana's MPS remained the import duties in place to protect domestic producers of poultry meat. This report also documents the evolution of agricultural policies-related greenhouse gas emissions in Guyana for the first time. The poultry subsector, which receives most of the policy support in Guyana, emits little. Sugar and rice, on the other hand, are the commodities with the highest GHG emissions per hectare. To conclude, several policy recommendations are presented.

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LIST OF ABBREVIATIONS

ACE | Agricultural Carbon Emissions

CARICOM | Caribbean Community

CDB | Caribbean Development Bank

CDF | CARICOM Development Fund

CET | Common External Tariff

CPI | Consumer Prix Index

CSE | Consumer Support Estimate

EPA | Economic Partnership Agreement

EU | European Union

GDP | Gross domestic product

GHG | Greenhouse Gas

GSSE | General Services Support Estimate

GuySuCo | Guyana Sugar Corporation

GY$ | Guyanese dollar

IDB | Inter-American Development Bank

IICA | Inter-American Institute for Cooperation on Agriculture

IMF | International Monetary Fund

IsDB | Islamic Development Bank

LAC | Latin America and the Caribbean

MPD | Market Price Differential

MPS | Market Price Support

NACEN | National Advisory Committee on External Negotiation

NAREI | National Agriculture Research and Extension Institute

NGO | Non-Governmental Organization

NSV | Net Social Value

OECD | Organization for Economic Co-operation and Development

PSE | Producer Support Estimate

TSE | Total Support Estimate

UN | United Nations

UNFCCC | UN Framework Convention on Climate Change

USAID | US Agency for International Development

VAT | Value-added Tax

WTO | World Trade Organization

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INTRODUCTION

This report offers an update on the application of the Producer Support Estimate (PSE) methodology to Guyana for the period 2015-2019. The PSE is a quantitative approach developed by the Organization for Economic Cooperation and Development (OECD) to assess the level and the composition of the support provided by agricultural policies. It has been previously applied to Guyana by the Inter-American Development Bank (IDB) for the period 2010-2014 (Derlagen, 2017).[1]

Since 2003, Agrimonitor, an IDB initiative, has been estimating and regularly updating the PSE for countries in the Latin America and the Caribbean (LAC) region. The comparability of policy indicators measured by the PSE across countries and over time is particularly valuable to understand incentives or public policy disincentives for the agricultural sector, and thus as a tool to guide policymaking in the region.

This report also documents the evolution of agricultural policies-related greenhouse gas emissions in Guyana using a methodology developed by the IDB and Professor Tim Josling. It is the first time that this methodology has been applied in Guyana.

The first chapter of the report provides an overview of the role of agriculture in the economy of Guyana and of agricultural policies which have been in place over the period 2015-2019. The second chapter presents the results of the PSE, and offers a comparison of the level and structure of agricultural support in Guyana with those of other countries in the region. The third chapter focuses on agricultural policies-related greenhouse gas emissions for the period 2015-2019. The fourth and last chapter provides policy recommendations based on what has been observed through the application of these different tools.

THIS REPORT ALSO DOCUMENTS THE EVOLUTION OF AGRICULTURAL POLICIES-RELATED GREENHOUSE GAS EMISSIONS IN GUYANA USING A METHODOLOGY DEVELOPED BY THE IDB AND PROFESSOR TIM JOSLING. IT IS THE FIRST TIME THAT THIS METHODOLOGY HAS BEEN APPLIED IN GUYANA

1. Derlagen, C., Tas, J., Schik, O., Boyce, R. and De Salvo, C. P. (2017). *Analysis of Agricultural Policies in Guyana*. IDB.

1. OVERVIEW OF THE SECTOR AND POLICIES BETWEEN 2015 AND 2019

1.1. THE ROLE OF AGRICULTURE IN THE ECONOMY

The southernmost member of the Community of Caribbean (CARICOM) states, Guyana is a low-income country with a population of close to 800,000 people and a GNI per capita of US$ 6,630 (Table 1) in 2019. A former British Colony, Guyana lies in the northwestern part of South America between Venezuela and Suriname, formerly Dutch Guyana. It is a sparsely populated country, with around 90% of the population concentrated in the northeast around the capital Georgetown, while the rest lives in the dense rainforest, amongst the most well-preserved in the world.

TABLE 1: KEY MACRO INDICATORS

INDICATOR	2014	2015	2016	2017	2018	2019
GNI PER CAPITA (CURRENT US$)	5,570	5,470	5,600	5,910	6,290	6,630
REAL GDP GROWTH RATE	1.7	0.7	3.8	3.7	4.4	5.4
EXPORT AS % OF GDP	37.93	36.01	41.11	40.43	35.47	33.01
AGRICULTURE, FORESTRY, AND FISHING AS % OF VALUE ADDED TO GDP	24.59	25.44	20.39	22.76	19.54	17.60
SUGAR (% OF AGRICULTURAL VALUE)	16.7	17.9	17.1	12.1	7.5	6.6
RICE PADDY (% OF AGRICULTURAL VALUE)	42.4	33.6	27.4	33.6	34.9	37.9
MANUFACTURING AS % OF GDP	6.05	5.94	4.97	4.79	4.67	5.05
SUGAR (% OF MANUFACTURING VALUE)	14.59	22.46	23.18	17.73	10.22	7.78
RICE (% OF MANUFACTURING VALUE)	25.68	19.81	15.19	20.10	21.87	26.03

Sources: Guyana Bureau of Statistics, World Bank and International Monetary Fund (IMF)

As can be seen from **Table 1**, the agriculture sector plays a critical role in the economy and has, on average for the period under study, contributed to 21.15% of the gross domestic product (GDP). However, the share of the agricultural sector has been gradually decreasing over the years.

Over the same period, exports have averaged at 38.26% of the GDP and, as of 2018, agriculture products themselves (sugar and rice) account for 15.5% of total exports (down from 28.6% in 2010).[2] The other main export commodities are raw gold (55.7% of exports in 2018), bauxite (9.3% of exports in 2018), and seafood and its by-products (7.1% of exports in 2018).

As a result of high export commodity prices, Guyana experienced a relatively high growth rate averaging 4.7% per year between 2005 and 2013[3]. However, the growth rate dipped to 1.7% in 2014 and then to 0.7% in 2015 due to a slowdown in the agricultural output rate due to El Niño. It has since returned to a higher rate of growth (4.32%, on average, over 2016-2019), despite structural readjustments in the sugar industry leading to public divestment and layoffs, and poor infrastructure hindering the development of the mining and resource extraction sector[4].

2. Guyana Bureau of Statistics.

3. Derlagen, C., Tas, J., Schik, O., Boyce, R. and De Salvo, C. P. (2017). *Analysis of Agricultural Policies in Guyana*. IDB.

4. Comisión Económica para América Latina y el Caribe (CEPAL), (2018). Guyana – Economic Survey of Latin American and the Caribbean.

As shown in **Tables 1** and **2**, rice is the most important agricultural commodity by volume as well as value accounting for a total of 26% of the manufacturing value and 37.9% of the agricultural value in 2019. Other important crops include sugarcane, coconut, and tomatoes. Livestock mainly consists of milk, poultry, beef, and eggs. As can be seen from the data, rice faced considerable volatility in production between 2015 and 2017, with production dropping by 22% in 2016, before recovering and reaching over a million tons in 2019, a 53% increase relative to 2015. The sugar industry, on the other hand, continued its sharp decline. Production of sugarcane fell by 63% between 2015 and 2019. The sugar industry suffered on account of diminishing global demand but mainly due to the abolishment by the European Union (EU), the biggest importer of sugar, of the quota system (the EU Sugar Protocol), which allowed the African, Caribbean, and Pacific group of states (of which Guyana is a member) to sell at over two times the market price. While this points to the need for structural changes in the sugar industry given the new circumstances, the volatility in the rice production resulted from climate change leading to extremely dry conditions in 2016, affecting harvest[5]. Overall, between 2015 and 2019, the growth observed in agricultural production in Guyana **(Figure 1)** continued to be primarily driven by rice and poultry production.

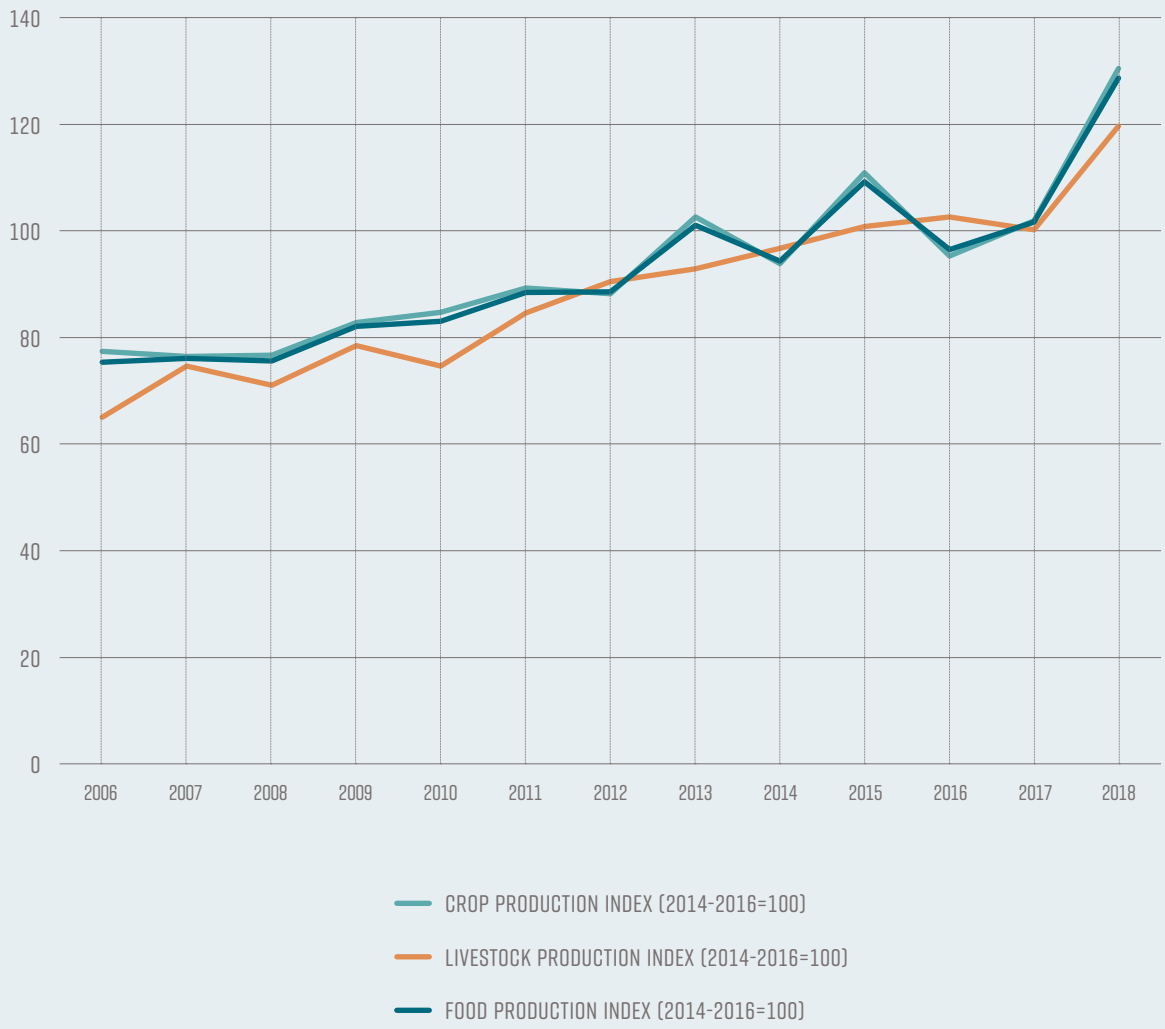
TABLE 2: PRODUCTION BY VOLUME, 2015-2019

PRODUCTS	UNITS	2015	2016	2017	2018	2019
RICE PADDY	METRIC TONS	1,058,129.00	822,229.00	969,391.00	965,120.00	1,049,874.00
RICE EQUIVALENT	METRIC TONS	687,784.00	534,450.00	630,104.00	627,328.00	682,418.10
SUGARCANE	METRIC TONS	2,815,616.00	2,366,995.00	1,859,037.00	1,214,495.00	1,042,088.00
RAW SUGAR	METRIC TONS	231,145.00	183,615.00	137,307.00	104,642.00	86,840.67
COCONUT	METRIC TONS	90,960.00	170,699.00	136,606.00	136,603.00	117,004.00
MILK	MLN LITRES	55,327.00	55,000.00	55,000.00	55,000.00	55,000.00
POULTRY	METRIC TONS	30,678.00	32,163.00	30,668.00	42,022.00	52,315.00
TOMATOES	METRIC TONS	21,480.00	19,092.00	28,479.00	38,563.00	35,560.00
BEEF	METRIC TONS	2,282.00	2,036.00	1,979.00	2,128.00	2,828.00
EGG	MLN	26.14	19.37	28.91	32.08	46.62

Source: FAOSTAT.

5. Foreign Agricultural Services, US Department of Agriculture, (2017). Commodity Intelligence Report – Guyana Rice.

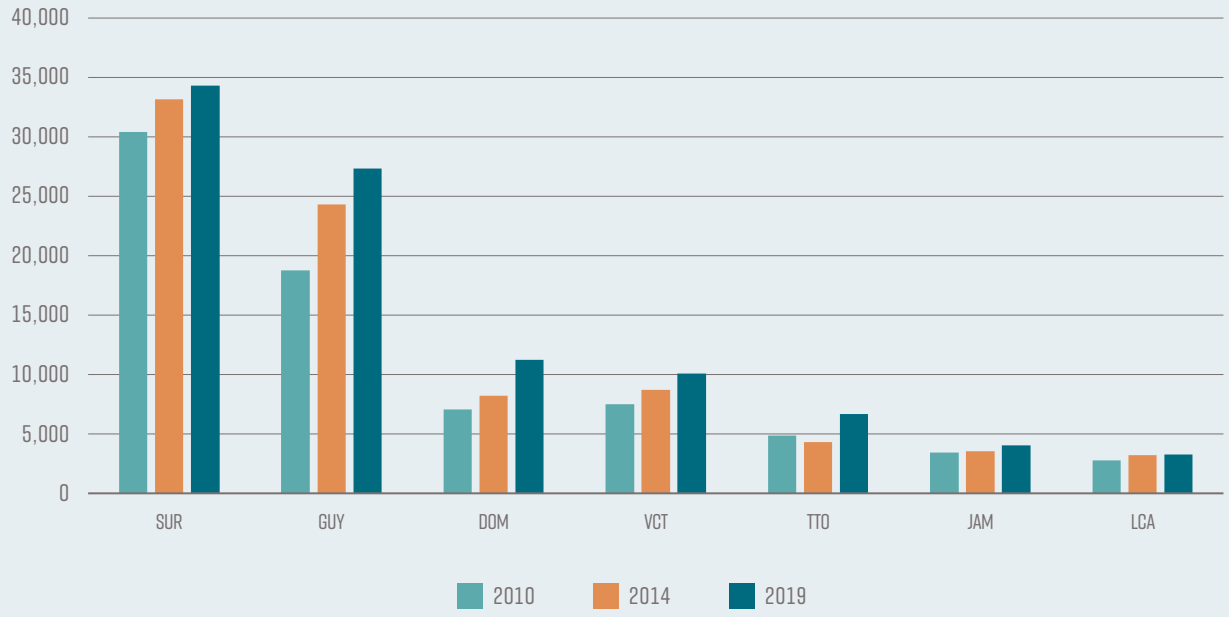
FIGURE 1: CROP, LIVESTOCK AND FOOD PRODUCTION INDICES IN GUYANA, 2006-2018



Source: FAOSTAT.

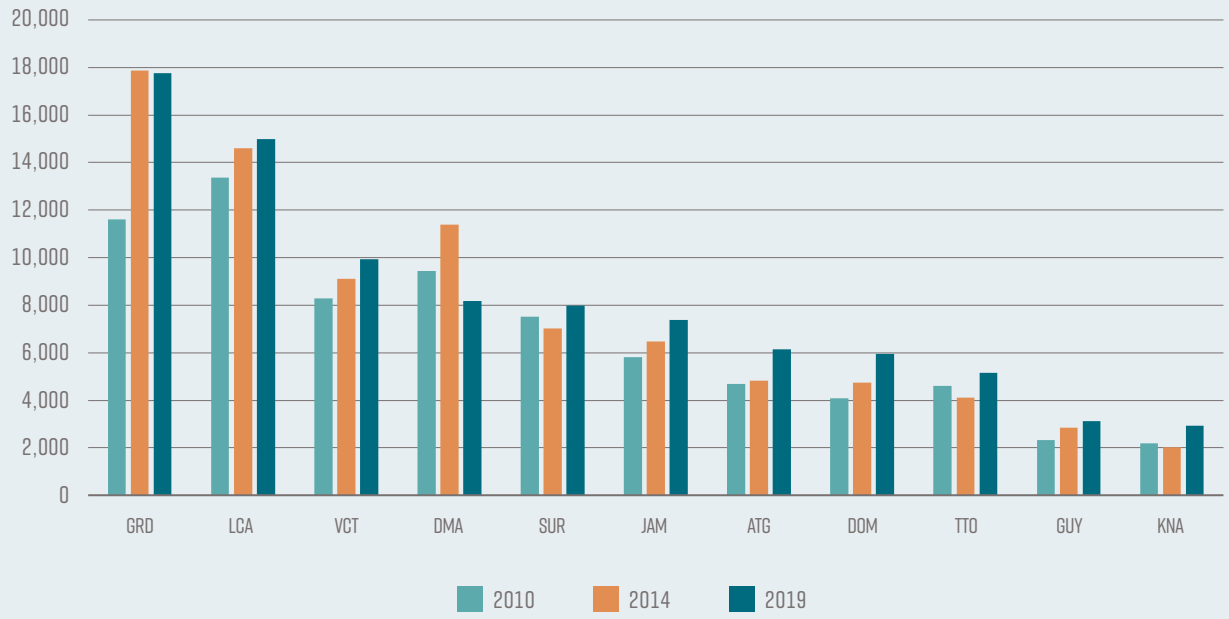
Compared to other Caribbean countries, labor productivity in the agriculture sector was relatively high in Guyana **(Figure 2)**. Land productivity, however, was among the lowest in the region **(Figure 3)**. Derlagen (2017) explained that this is primarily the result of the significant amount of land dedicated to sugarcane production (though it has recently been declining as it went from 12% of Guyana's total arable land in 2015 down to 4% in 2019).

FIGURE 2: VALUE ADDED PER AGRICULTURAL WORKER FOR SELECTED CARIBBEAN COUNTRIES, IN CONSTANT 2010 US$*



Source: World Development Indicators (WDI).
(*) ATG: Antigua and Barbuda; DMA: Dominica; DOM: Dominican Republic; GRD: Grenada; GUY: Guyana; JAM: Jamaica; SUR: Suriname; TTO: Trinidad and Tobago; VCT: St. Vincent and the Grenadines; KNA: St. Kitts and Nevis; LCA: St. Lucia.

FIGURE 3: AGRICULTURE VALUE ADDED PER HECTARE OF ARABLE LAND IN SELECTED CARIBBEAN COUNTRIES, IN CONSTANT 2010 US$



Source: Author's estimation using data from WDI.

The business environment in Guyana had remained uncompetitive and mired with bureaucratic constraints that hinder economic development. The country ranked 121 out of 140 on World Economic Forum's Global Competitive Report in 2015 and has since then not met the minimum requirements to be surveyed. Specifically, the country performed particularly poorly on the parameters of infrastructure, innovation, government institutions, and technology readiness. Similarly, the World Bank's Doing Business 2019 report ranked the country 136 out of 190, down ten places from 126 it had achieved in 2018 but slightly better than 137 in 2016. This is considerably below the average for other CARICOM countries but still better than neighbor Suriname which ranked 165. The report highlights difficulties in obtaining construction permits, getting electricity, trading across borders, and resolving insolvency in Guyana.

Since 2019, the start of large-scale oil production has resulted in GDP growth averaging 32 percent in 2020-2021.[6] In the non-oil sector, construction and public investment has increased rapidly. Government revenues are growing at a double-digit pace as well, opening up the potential for an increase in public investment in the agriculture sector.

6. International Monetary Fund (IMF) World Economic Outlook dataset, April 2022.

1.2. AGRICULTURAL POLICIES – PRIORITIES AND IMPLEMENTATION

For the 2015-2019 period, the primary agricultural policy driving instrument was the Plan "Vision for Agriculture 2020: A National Strategy for Agriculture in Guyana 2013-2020", which sought to develop the agricultural sector into a vehicle for sustained economic and social prosperity for the country toward the broader, more ambitious, goal of eradicating poverty and hunger by 2025 and becoming a high middle-income developing country.

Apart from ensuring food security, the Government aimed to develop a knowledge-based, multifunctional agricultural sector, transforming it from a subsistence livelihood provider into a national wealth generator. It also sought to create an entrepreneurial industry capable of meeting domestic and export food and non-food demand. This policy document, designed with a more holistic approach, differs from the previous agricultural strategies such as the 5-Cs and 4Ps, which focused on a particular set of commodities in the post-independence period. It developed an umbrella plan for expanding the interrelated facets of the agricultural sector for a more comprehensive implementation, including both food and non-food (such as local furniture and crafts) sub-sectors. This is succinctly conveyed through **the five core areas of focus mentioned in the document, collectively called the F-5:**

1. **Food Security**

   Consolidating the end of hunger in Guyana, ensuring everyone has enough food in every community.

2. **Fiber and Nutritious Food Accessible by Citizens**

   Nutrition security for all.

3. **Fuel Production**

   Helping to develop alternative fuel sources, reducing dependency on fossil fuels, and creating a bio-energy industry in Guyana.

4. **Fashion and Health Products**

   An agro-process industry that creates a new industry in Guyana.

5. **Furniture and Crafts**

   An industry which the Government expects to grow in importance in Guyana.

The document further highlighted 25 priority areas with actionable goals and predetermined targets. Progress along these is measured through a comprehensive set of indicators elucidated in the strategy. **The main goals set by Guyana for its food and agricultural sector were:**

- Cutting imports of staple foods like corn, onion, and potatoes.
- Increasing production and export of rice and sugar, in both raw and value-added forms.
- Emphasizing the development of refining and packaging capabilities.
- Being self-sustainable in meeting the demand for milk and other dairy products.
- Becoming a net meat exporter from a net meat importer.
- Increasing packaging and processing of agricultural products, reducing import dependency, and increasing exports of value-added commodities.
- Achieving an annual agricultural sector growth rate higher than 5%.

The Government's attention to the National Strategy's diversification objective was evident as shown in the presentation of the budget for FY2019 by Finance Minister Winston Jordan, as he acknowledged that *"while agrarian agriculture continues to be important, new frontiers need to be opened for plantation agriculture"*[7]. At that time, the focus was on productivity improvement and infrastructure for new value chains to create value-added industries through increased investment in agro-processing that would eventually lead to improved institutional capacity. The same speech underlined that the *"Government must ramp up diversification efforts to take advantage of available resources"*, including investing in research and development of improved crop varieties producing greater yields while consuming fewer resources.

It is worth noticing that in 2022 exogenous shocks in global food prices hit hard to Caribbean countries where more than 70% of the Regions food are imported. An initiative has been launched to slash extra-regional CARICOM food imports by 25% by 2025. As wrote in the Agriculture Investment Prospetus (2022)[8] *"...Caribbean*

7. Ministry of Finance, 2019. Full budget speech available at https://finance.gov.gy/?cat=9

8. Ministry of Agriculture, 2022, available at https://agriculture.gov.gy/wp-content/uploads/2022/05/Agri_Prospectus_MAY3_Final.pdf

must be prepared to produce more of what it consumes and to consume more of what it produces…". This involves expanding regional production, introducing new and appropriate technologies, investing in human capital development and research and development, and intensifying intra-regional trade in agricultural commodities and products.

At the institutional level, the Ministry of Agriculture in Guyana is responsible for formulating and implementing policies and programs for the development of agriculture and fisheries in Guyana. It operates through the following **four key program areas:**

1. **Ministry Administration:** The administrative arm of the Ministry responsible for coordination with other ministries, primarily the Ministry of Finance, and international organizations, as well as across departments under the Ministry to ensure proper resource allocation (financial, human, and others) for the implementation and administration of the Ministry's various programs and operations.

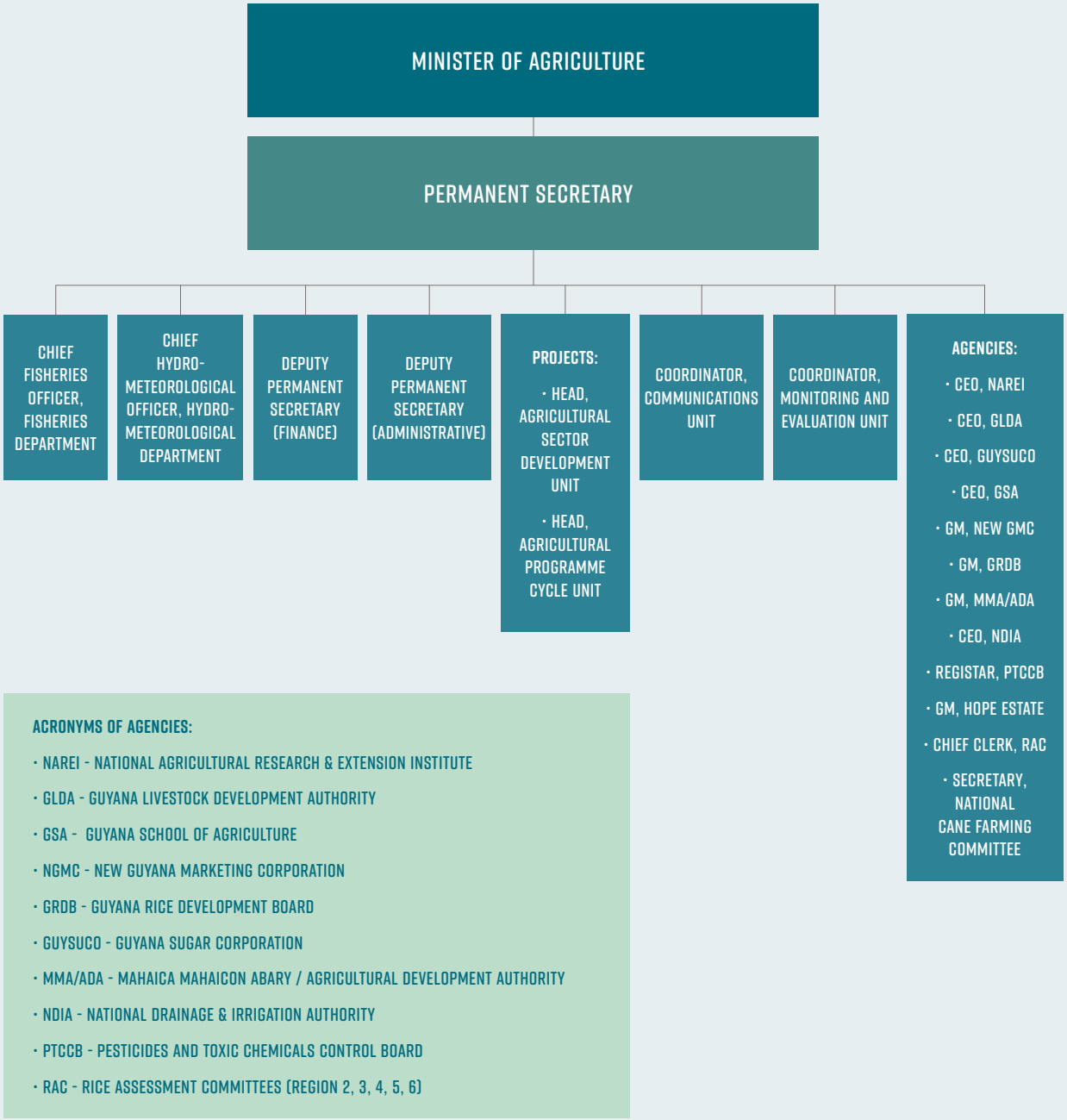
2. **Agriculture Development and Support Services:** Responsible for supporting the development and promotion of the crop and livestock sub-sectors and formulating the necessary technical and regulatory framework.

3. **Fisheries:** Manages, regulates, and promotes the development of the fisheries sub-sector and provides the framework for support and research.

4. **Hydrometeorological services:** Provides hydrological, meteorological, and oceanographic reports and advice, critical to the scientific management of the crops, livestock, and fisheries sub-sectors.

The organization of the Ministry of Agriculture is illustrated in **Figure 4**. There are ten semi-autonomous agencies that carry out the technical work in support of the general strategic plan outlined by the Ministry. Each agency has a board of directors answerable to the Minister of Agriculture through its day-to-day functioning, and the budget is managed semi-autonomously by a Chief Executive Officer (CEO).

FIGURE 4: ORGANIZATIONAL CHART OF THE MINISTRY OF AGRICULTURE IN GUYANA



Source: Website of the Ministry of Agriculture.

TABLE 3: MAIN SEMI-AUTONOMOUS AGENCIES UNDER THE MINISTRY OF AGRICULTURE FOR 2015-2019

AGENCY	DESCRIPTION
GUYANA RICE DEVELOPMENT BOARD (GRDB)	Semi-autonomous body responsible for the rice industry's overall development, including promoting rice exports, coordinating research for improved varieties, licensing mills and exports, and grading and certifying rice and paddy.
GUYANA LIVESTOCK DEVELOPMENT AUTHORITY (GLDA)	Semi-autonomous body responsible for developing the livestock sub-sector, including providing services in livestock husbandry, health, research, as well as disease surveillance and control, veterinary care, and trade regulation.
GUYANA SUGAR CORPORATION (GUYSUCO)	State-owned sugar corporation with a monopoly in sugar processing and export in Guyana. It was recently subjected to a plan of divestment and restructuring under the Parliament mandated 'Sugar Task Force'.
NEW GUYANA MARKETING CORPORATION (NEW GMC)	Provides marketing assistance and services including those on retail and wholesale prices, transportation, and export packaging to the non-rice, non-sugar (non-core) agricultural sector.
NATIONAL AGRICULTURAL RESEARCH AND EXTENSION INSTITUTE (NAREI)	Responsible for agricultural research and development, including those into more productive, and resistant crop varieties and advices the Agriculture Minister on relevant policy matters.
NATIONAL DRAINAGE AND IRRIGATION AUTHORITY (NDIA)	Maintains and operates relevant drainage, irrigation, and flood control infrastructure.
MAHAICA MAHAICONY ABARY AGRICULTURE DEVELOPMENT AUTHORITY (MMA-ADA)	Responsible for allocating state lands between the Mahaica and Berbice rivers. Constructs, operates, and maintains drainage and irrigation agricultural infrastructure in region 5, Mahaica/Berbice on the north-eastern coast.

Sources: Ministry of Agriculture and Derlagen (2017).

In the absence of an overarching law governing the agricultural sector, a variety of legislation exists dealing with agricultural issues and its various sub-sectors, as presented in **Table 4**.

TABLE 4: MAIN LEGAL INSTRUMENTS GOVERNING THE AGRICULTURAL SECTOR IN GUYANA

NAME OF LEGISLATION	DESCRIPTION
RICE FACTORIES ACT	Regulates rice mills and payments to farmers
RICE DEVELOPMENT BOARD ACT	Established the Guyana Rice Development Board which regulates the value-added aspects, namely manufacture and marketing, of rice.
SUGAR INDUSTRY SPECIAL FUNDS ACT	Established a price stabilization fund, rehabilitation fund, and labor welfare fund for the sugar industry.
SEEDS ACT	Regulates the production, sale, import, and exports of seeds.
GUYANA LIVESTOCK DEVELOPMENT AUTHORITY ACT	Deals with matters of animal health, production, and trade through the establishment of the Guyana Livestock Development Authority.
FISHERIES ACT	Provides for the promotion, management, development of fisheries through regulating fishing in Guyana's internal and maritime waters and its domestic and international trade.
MARITIME ACT	Defines maritime boundaries and regulated maritime research, mariculture, and conservation.

Sources: Ministry of Agriculture and ECOLEX.

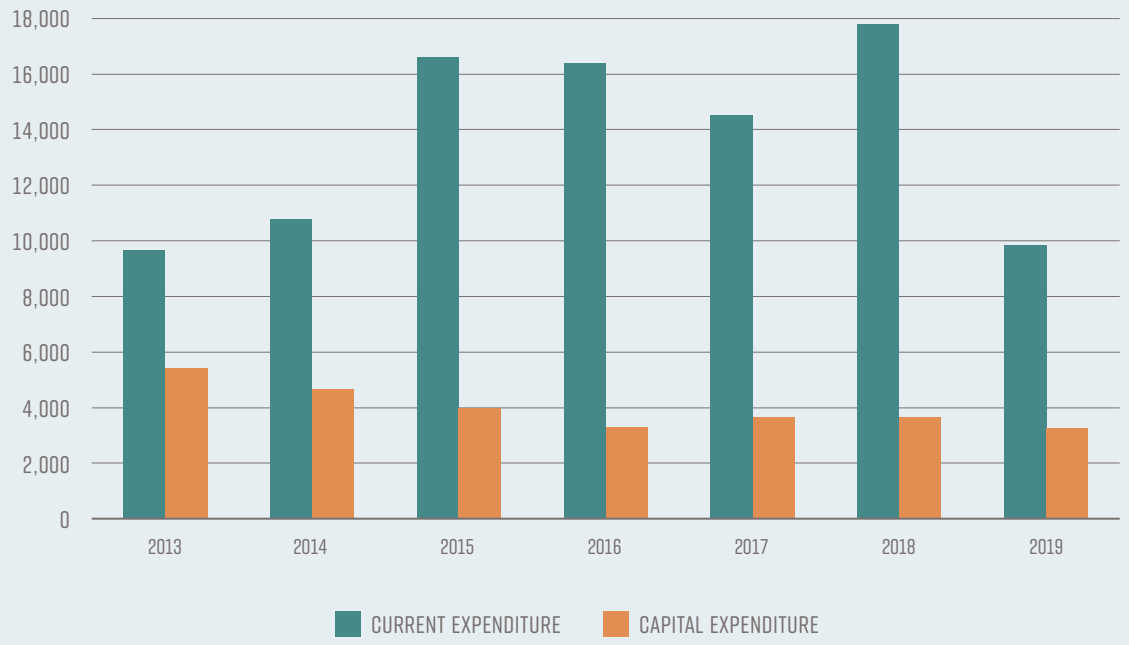
1.3. AGRICULTURAL POLICIES: OVERVIEW OF SUPPORT POLICIES AND ACTIONS

Between 2015 and 2018, the budget allocated to the Ministry of Agriculture increased from GY$ 20.6 billion to GY$ 21.5 billion. In 2019, however, it declined sharply to GY$ 13.1 billion. While the Ministry of Agriculture's budget represented 11% of the Government's total budget in 2015, it only amounted to 4% in 2019.

The main driver behind this change is the end of subsidies provided to cover the losses of the Guyana Sugar Corporation (GuySuCu), the largest employer in Guyana **(Figure 6)**. In a 2019 speech, President Granger noted that the *"Government cannot sustain the sugar industry in its current state"*, highlighting the overall policy direction at the time which saw Government subsidies to GuySuCo fall from GY$ 6 billion in 2015 (29% of the Ministry of Agriculture's total budget and 66% of its current expenditure) to 0 in 2019.[9]

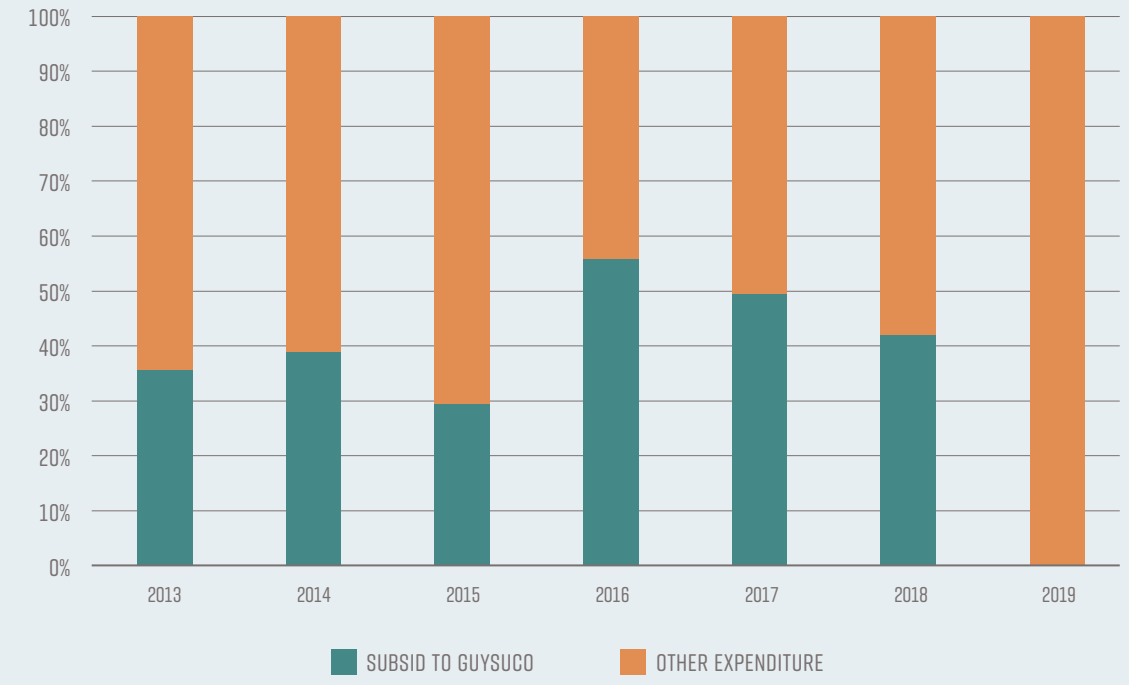
9. Ministry of Finance, Budget speeches available at https://finance.gov.gy/?cat=9

FIGURE 5: BUDGET OF THE MINISTRY OF AGRICULTURE, 2013-2019 IN CURRENT MILLION GY$



Source: Ministry of Finance (Budget Estimates).

FIGURE 6: SHARE OF MINISTRY OF AGRICULTURE'S BUDGET GOING TO GUYSUCO, 2013-2019



Source: Ministry of Finance (Budget Estimates).

Following the PSE methodology, support policies for agriculture in Guyana can be divided into two broad categories: those that imply budgetary transfers (or a flow of Government funds) and/or a revenue foregone; and those that instead create a gap between domestic market prices and border (or competitive) prices (price transfers).[10]

BUDGETARY TRANSFERS: PROJECTS, POLICIES, AND PROGRAMS

Budgetary transfers include budget allocations to the Ministry's semi-autonomous agencies, to regions (decentralized entities), to state-owned enterprises (GuySuCo) as well as to national and/or donor-funded agricultural development projects.[11] The main investment projects are presented in **Annex 1**. Budgetary transfers also include a number of tax exemptions for agricultural inputs such as fertilizers and pesticides, granted under the value-added tax (VAT) Act and the Customs Act.[12] However, in the absence of data on revenue foregone, these exemptions were not included in the calculations of support indicators.

PRICE TRANSFERS: DUTIES AND TAX EXEMPTIONS

Agriculture support policies that generate price transfers are primarily related to trade regulations. Between 2015 and 2019, Guyana continued implementing its 2003 National Trade Strategy, which states that the focus should be on enhancing market access for Guyanese exports. This national strategy is to be updated in 2020. Guyana's trade policy is under the responsibility of the Ministry of Foreign Affairs. It is coordinated at the domestic level within the National Advisory Committee on External Negotiation (NACEN) and at the regional level within CARICOM.

Since Guyana is a CARICOM member, imports from fellow CARICOM countries and countries that signed regional trade agreements with CARICOM (Colombia, Costa Rica, Cuba, the Dominican Republic, and Venezuela) are duty-free across tariff lines. Conversely, Guyana applies CARICOM's Common External Tariff (CET) on all imported goods, except on those that are either not

10. In line with the PSE methodology, agriculture support policies are here understood as policies that are agriculture-specific or that benefit primarily agricultural producers.

11. Between 2015 and 2019, agriculture-related capital expenditures of Guyana's ten regions increased significantly from GY$ 0.2 billion in 2015 to GY$ 0.54 billion in 2019 (Source: Ministry of Finance – Budget Estimates).

12. WTO (2016). Trade Policy Review – Report by the Secretariat – Guyana.

produced, insufficiently produced or produced in substandard quality within CARICOM. According to the World Trade Organization (WTO), the average tariff protection in 2019 in Guyana is 22.3% for agricultural products and 10% for non-agricultural products. There has not been any significant change during the period of this study since 2014: then, average tariffs for agricultural and non-agricultural products were 22.7% and 10%, respectively. **Table 5** below shows import duties, from smallest to largest, for a number of key agricultural commodities, which have been selected for the PSE analysis.

Guyana is also a member of the CARIFORUM Economic Partnership Agreement (EPA), which grants all CARIFORUM goods duty-free and quota-free access to the EU (except for rice and sugar). In addition, Guyana has ratified bilateral free trade agreements with Brazil, China, and Venezuela, and enjoys preferential market access to the United States (under the Caribbean Basin Trade Partnership Act, CBTPA) and Canada (under CaribCan).[13]

TABLE 5: IMPORT DUTIES

IMPORT DUTIES	DUTY RATE - CET
RICE	25.00%
SUGAR	40.00%
COCONUT	40.00%
TOMATOES	40.00%
BEEF	40.00%
POULTRY MEAT	100.00%

Source: Guyana Revenue Authority (Revised Common External Tariff of the Caribbean Community, 2017 Edition).

The VAT in Guyana is applied both to domestically produced goods and services and imports at a general rate of 16%. Under the VAT Act, however, for a number of food items such as raw sugar, white or brown rice, and chicken, domestic production is exempted from VAT, while imports are not.[14]

13. United States Department of Commerce: https://www.trade.gov/country-commercial-guides/guyana-trade-agreements

14. Derlagen (2017).

2. ESTIMATE OF SUPPORT TO AGRICULTURE

2.1. METHODOLOGY[15]

The PSE is a standardized quantitative approach developed by the Organization for Economic Co-operation and Development (OECD) to measure the support to the agricultural sector. Since 1987, the OECD has been estimating and regularly updating the PSE for its member countries and, increasingly, for other associated countries. Furthermore, since 2003, Agrimonitor has been doing the same for its member countries in the Latin America and the Caribbean (LAC) region.

15. OECD (2010). OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculations, Interpretation and Use (The PSE Manual). Paris, France.

The PSE estimates the support to the agricultural sector coming from policies that imply both budgetary transfers (and/or revenue foregone) and price transfers. While the former can be easily expressed in monetary, and thus comparable, terms, the latter requires an extra layer of analysis in order to compare observed market conditions to a benchmark situation. The aggregated effect of such policies in the supply-demand model is measured by the price ratios in the "with-" and "without-policy" situations. Producer prices (at farm gate) are thus compared to "reference" (or "border") prices that would be expected without policy interventions (i.e., in a market equilibrium scenario). The impact of price policies is measured by the gap between market and reference prices, also referred to as the Market Price Differential (MPD). If the gap is positive, policies benefit producers. If the gap is negative, it represents an implicit taxation of farmers to the benefit of consumers. When aggregated at the sector's level (by multiplying the MPD by the level of domestic production), the Market Price Support (MPS) is obtained.

Policies that generate budgetary transfers and/or revenue forgone, on the other hand, need first to be sorted. According to the OECD methodology, only those that are agriculture-specific or that benefit primarily agricultural producers need to be included in the measurement of support.[16] For those that fit this criterion, implementation costs such as salaries, travel expenses, and capital goods, which do not produce any transfers to producers, are not considered. These policies then need to be classified according to the nature of the services they provide either to individual producers (PSE), individual consumers (Consumer Support Estimate, or CSE), or to the sector as a whole (General Services Support Estimate, or GSSE). Even though budget expenditures are well detailed in Guyana, such a classification is sometimes tricky. In the absence of detailed budget expenditure information, and to remain consistent with the Derlagen (2017), the following rules were applied:

- For policies that support both individual producers (PSE) and the sector as a whole (GSSE), 50% of expenditures have been attributed to GSSE and 50% of costs to PSE.

- If most expenditures of a selected policy can be defined as a budget transfer to individual producers, the entire policy is considered to support individual producers (PSE). In turn, if most expenditures of a selected policy can be defined as a budget transfer to the sector as a whole, the entire policy is considered to support the sector as a whole (GSSE).

16. Forestry and fishery support policies are thus excluded.

The **Total Support Estimate (TSE)** "represents the sum of all three components, adjusted for double-counting, given that the transfers associated with MPS policies appear in both the PSE and CSE calculation".

2.2. DATA DESCRIPTION AND ANALYSIS

The data used in this analysis comes from different sources. The main ones are listed in **Table 6**.

TABLE 6: DATA SOURCES

DATA	MAIN SOURCES
VOLUMES OF PRODUCTION	MINISTRY OF AGRICULTURE AND FAOSTAT
FARM-GATE PRICES	MINISTRY OF AGRICULTURE, BUREAU OF STATISTICS AND FAOSTAT
REFERENCE PRICES	BUREAU OF STATISTICS, UN COMTRADE AND FAOSTAT
TRADE DATA	BUREAU OF STATISTICS, UN COMTRADE AND FAOSTAT
PUBLIC EXPENDITURES	MINISTRY OF FINANCE

In order to estimate the MPS, the OECD recommends selecting a basket of commodities representing at least 70% of the total value of agricultural production on average over the previous three years. **Figure 7** presents the list of selected commodities (or "MPS commodities") and their respective individual shares of the value of agricultural production both in Derlagen (2017) and in the present analysis (average 2015-19). Between these two periods, the shares of beef, poultry, tomato and coconut increased, while the shares of rice and sugarcane decreased by 15% and 33%, respectively. Overall, while MPS commodities represented an average of 79% of the value of production over the period 2010-2014, they represent an average of 77% of the value of production over the period 2015-2018.

Between 2015 and 2019, the following remained net exported commodities: rice, sugar, coconut, and tomato; while poultry and beef remained net imported.

FIGURE 7: AVERAGE SHARE OF SELECTED COMMODITIES TO TOTAL VALUE OF AGRICULTURAL PRODUCTION IN GUYANA

Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT

2.3. RESULTS: LEVEL AND STRUCTURE OF SUPPORT TO PRODUCERS

The results of the PSE for Guyana over the period 2015-2019 are presented in **Table 7**.

TABLE 7: SUPPORT ESTIMATE IN GUYANA (2015-2019)

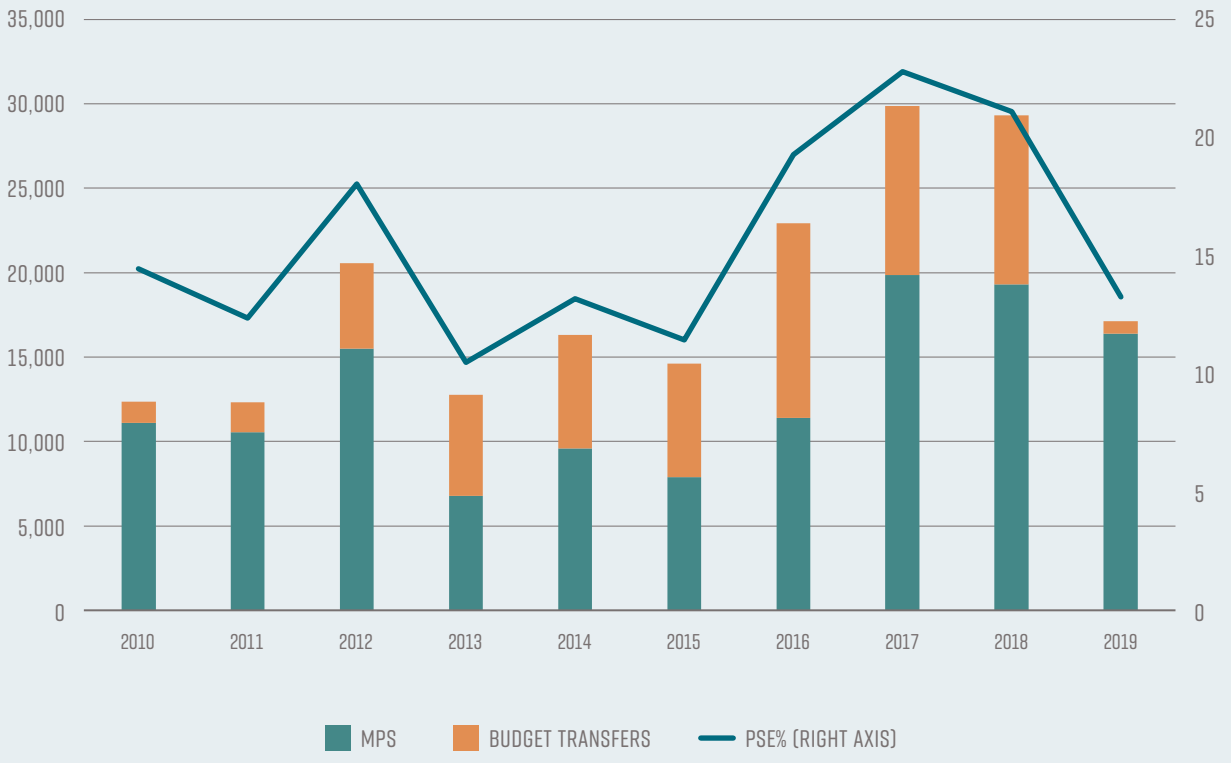
INDICATORS		UNITS	2015	2016	2017	2018	2019
I.	**TOTAL VALUE OF PRODUCTION (AT FARM GATE)**	GY$ MN	120,798.7	107,380.5	120,981.2	129,004.1	128,375.0
	I.1. OF WHICH, SHARE OF MPS COMMODITIES (%)	%	73.9	76.9	78.5	80.1	78.2
II.	**TOTAL VALUE OF CONSUMPTION (AT FARM GATE)**	GY$ MN	67,768.1	63,846.1	79,223.5	90,402.8	86,267.8
	II.1. OF WHICH, MPS COMMODITIES	GY$ MN	49,759.1	50,139.9	61,576.5	73,721.7	68,564.1
III.1	**PRODUCER SUPPORT ESTIMATE (PSE)**	GY$ MN	14,600.1	22,939.2	29,860.9	29,326.0	17,142.3
	A. SUPPORT BASED ON COMMODITY OUTPUTS	GY$ MN	7,885.3	11,388.7	19,874.5	19,293.0	16,400.3
	A1. MARKET PRICE SUPPORT	GY$ MN	7,885.3	11,388.7	19,874.5	19,293.0	16,400.3
	BEEF MPS	GY$ MN	0.0	0.0	794.5	234.6	0.0
	COCONUT MPS	GY$ MN	1,003.9	0.0	0.0	0.0	0.0
	POULTRY MPS	GY$ MN	8,478.5	9,010.6	8,497.9	12,028.5	12,188.2
	RICE MPS	GY$ MN	-3,968.9	677.1	5,708.9	4,779.6	2,015.1
	SUGAR MPS	GY$ MN	0.0	0.0	0.0	0.0	0.0
	TOMATO MPS	GY$ MN	0.0	0.0	0.0	0.0	0.0
	OTHER MPS	GY$ MN	2,371.8	1,701.1	4,873.2	2,250.2	2,197.0
	A2. PAYMENTS BASED ON OUTPUT	GY$ MN	0.0	0.0	0.0	0.0	0.0
	B. PAYMENTS BASED ON INPUT USE	GY$ MN	6,714.8	11,550.5	9,986.3	10,033.1	742.1
	B1. VARIABLE INPUT USE	GY$ MN	391.7	326.4	751.5	756.4	461.1
	B2. FIXED CAPITAL FORMATION	GY$ MN	6,073.0	11,000.0	9,000.0	9,000.0	0.0
	B3. ON-FARM SERVICES	GY$ MN	250.1	224.1	234.8	276.7	281.0
III.2	**PERCENTAGE PSE**	%	11.4	19.3	22.8	21.1	13.3
IV.	**GENERAL SERVICES SUPPORT ESTIMATE (GSSE)**	GY$ MN	3,628.0	3,095.1	3,501.7	4,202.8	4,781.2
	H. AGRICULTURAL KNOWLEDGE AND INNOVATION SYSTEM	GY$ MN	616.3	725.4	787.6	883.1	960.4
	H1. AGRICULTURAL KNOWLEDGE GENERATION	GY$ MN	470.3	546.2	581.8	675.7	713.5
	H2. AGRICULTURAL KNOWLEDGE TRANSFER	GY$ MN	146.0	179.3	205.8	207.4	246.9
	I. INSPECTION AND CONTROL	GY$ MN	289.3	413.5	415.5	448.6	518.4
	I1. AGRICULTURAL PRODUCT SAFETY AND INSPECTION	GY$ MN	0.0	0.0	0.0	0.0	0.0
	I2. PEST AND DISEASE INSPECTION AND CONTROL	GY$ MN	289.3	413.5	415.5	448.6	518.4
	I3. INPUT CONTROL	GY$ MN	0.0	0.0	0.0	0.0	0.0
	J. DEVELOPMENT AND MAINTENANCE OF INFRASTRUCTURE	GY$ MN	2,608.7	1,863.0	2,201.9	2,759.9	3,174.0
	J1. HYDROLOGICAL INFRASTRUCTURE	GY$ MN	2,512.0	1,741.5	1,643.9	2,186.6	2,814.1
	J2. STORAGE, MARKETING AND OTHER PHYSICAL INFRA.	GY$ MN	59.2	84.0	470.8	573.3	359.9
	J3. INSTITUTIONAL INFRASTRUCTURE	GY$ MN	0.0	0.0	0.0	0.0	0.0
	J4. FARM RESTRUCTURING	GY$ MN	37.5	37.5	87.2	0.0	0.0
	K. MARKETING AND PROMOTION	GY$ MN	113.7	93.2	96.7	111.1	128.4
	K1. COLLECTIVE SCHEMES FOR PROCESSING & MARKET	GY$ MN	81.0	93.2	93.2	97.7	105.9
	K2. PROMOTION OF AGRICULTURAL PRODUCTS	GY$ MN	32.7	0.0	3.5	13.5	22.5
V.1	**CONSUMER SUPPORT ESTIMATE (CSE)**	GY$ MN	-9,976.9	-8,857.3	-13,675.5	-13,634.6	-11,686.0
	O. TRANSFERS TO PRODUCERS FROM CONSUMERS (-)	GY$ MN	-10,381.9	-10,838.1	-15,896.8	-16,253.4	-15,060.8
	P. OTHER TRANSFERS FROM CONSUMERS (-)	GY$ MN	-220.4	-254.2	-77.0	-9.8	-46.1
	Q. TRANSFERS TO CONSUMERS FROM TAXPAYERS	GY$ MN	625.4	2,235.0	2,298.3	2,628.6	3,420.9
Q.1.	**COMMODITY SPECIFC TRANSFERS TO CONSUMERS**	GY$ MN					
Q.2.	**NON-COMMODITY SPECIFIC TRANSFERS TO CONSUMERS**	GY$ MN	625.4	2,235.0	2,298.3	2,628.6	3,420.9
	R. EXCESS FEED COST	GY$ MN	0.0	0.0	0.0	0.0	0.0
V.2	**PERCENTAGE CSE**	%	-14.9	-14.4	-17.8	-15.5	-14.1
VI.	**TOTAL SUPPORT ESTIMATE (TSE)**	GY$ MN	18,853.4	28,269.3	35,660.8	36,157.4	25,344.4
	S. TRANSFERS FROM CONSUMERS	GY$ MN	10,602.3	11,092.3	15,973.8	16,263.2	15,106.8
	T. TRANSFERS FROM TAXPAYERS	GY$ MN	8,471.5	17,431.2	19,764.0	19,904.0	10,283.7
	U. BUDGET REVENUES (-)	GY$ MN	-220.4	-254.2	-77.0	-9.8	-46.1
PERCENTAGE TSE (IN GDP)		%	2.1	3.1	3.6	3.6	2.3

Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics, UN Comtrade and FAOSTAT.

2.3.1. ESTIMATES OF SUPPORT TO INDIVIDUAL PRODUCERS

Between 2015 and 2019, individual producers in Guyana continued to be positively supported by the public sector, despite significant fluctuations from one year to the other. Transfers to individual producers (PSE) are composed of two elements: the MPS, and budget transfers that support producers individually. The PSE reached GY$ 14.6 billion in 2015, increased to GY$ 23 billion in 2016 and to GY$ 29 billion between 2017 and 2018, before dropping down to GY$ 17 billion in 2019. Over the same period, the percentage PSE (%PSE; the support to producers expressed as a share of gross farm receipts) followed the same pattern. It rose to 19.3% in 2016 before dropping down to 13.3% in 2019. The main factor behind the PSE's sharp decline over the period of study is the end of Government transfers to GuySuCo in 2019.

FIGURE 8: PSE COMPOSITION IN GUYANA, IN MILLION GY$, 2010-2019

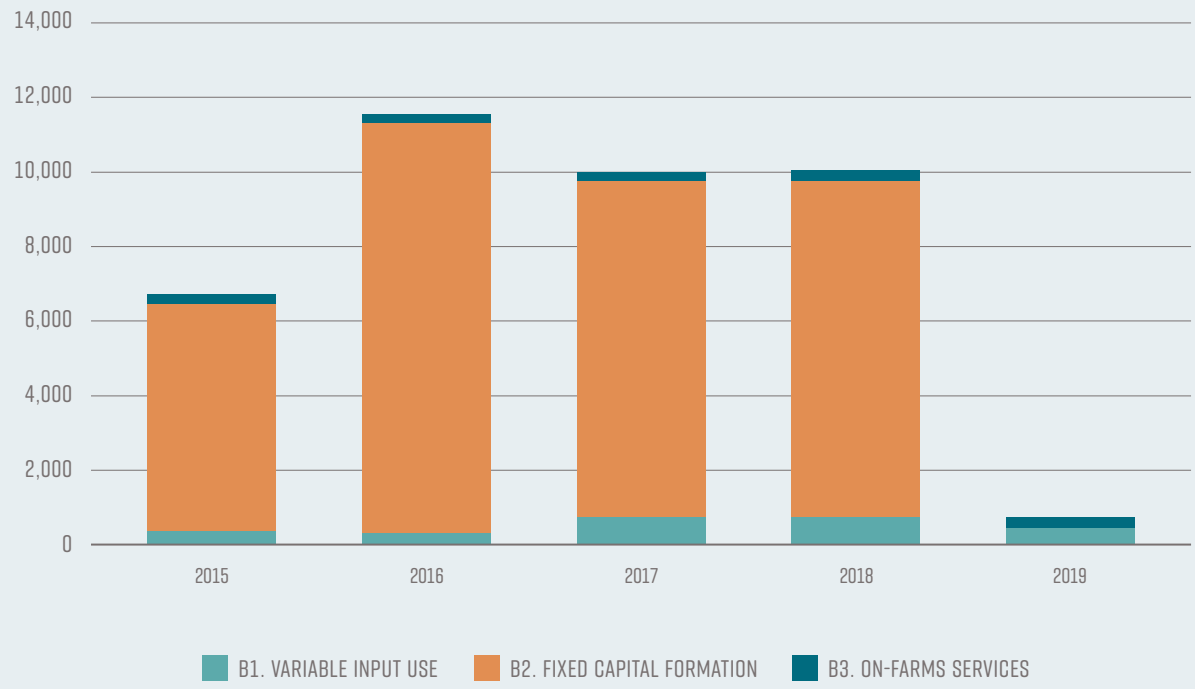


Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

As illustrated in **Figure 8**, the MPS continued to be a significant component of the support to the agricultural sector in Guyana, despite its distorting effects on producers' production decisions and its impact on consumers who end up paying higher prices for agricultural commodities than international prices. On average, between 2015 and 2019, the MPS represented 66% of the total PSE and GY$ 15 billion per year. Following the end of Government transfers to GuySuCo in 2019, which led to a sharp decline in budget transfers that year, the MPS expressed as a share of the total PSE reached 96% in 2019 (conversely, budget transfers dropped from 34% of the total PSE in 2018 down to 4% in 2019). The main driver of Guyana's MPS remained the import duties in place to protect domestic producers of poultry meat.

Budget transfers to individual producers include payments for variable input use, fixed capital formation such as transfers to GuySuCo, and on-farm services such as extension and livestock development. With the end of Government transfers to GuySuCo in 2019, budget transfers to individual producers fell from GY$ 10 billion in 2018 to GY$ 742 million in 2019 **(Figure 9)**.

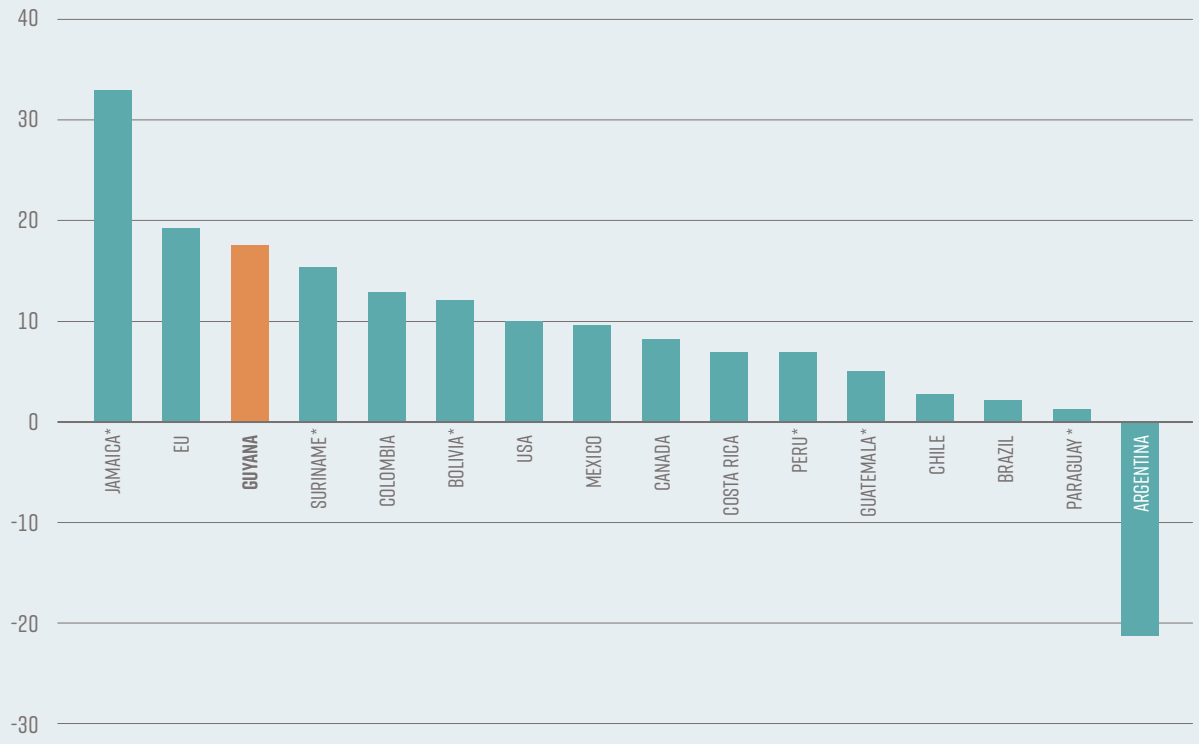
FIGURE 9: BUDGET TRANSFERS TO INDIVIDUAL PRODUCERS, IN MILLION GY$



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

Between 2015 and 2019, Guyana's average level of support to individual producers (%PSE of 17.6%) was one of the highest in the region **(Figure 10)**. It was higher than Suriname (15.4%), Bolivia (12.1%), and Colombia (12.9%), for instance, but still lower than Jamaica (33%).

FIGURE 10: %PSE IN GUYANA AND IN SELECTED COUNTRIES, 2015-2018/19



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics, FAOSTAT and Agrimonitor.
* Data not available for 2019; average over 2015-2018.

2.3.2. ESTIMATES OF SUPPORT TO INDIVIDUAL PRODUCERS BY COMMODITY

The level of support to individual producers by commodity is measured first by the MPS, and then by the single commodity transfer (SCT), which shows the level of commodity-specific support provided through both price support policies (MPS) and budget transfers.

The MPS indicator must be interpreted with care. While its intent is primarily to capture policy effects on agricultural producers and

consumers, it does also capture implicit non-policy effects such as:

- **The lack of physical infrastructures** such as rural roads, irrigation and drainage systems, and storage facilities, which all drive up production and transport costs.
- **Limited technology in the processing industry**, which constrains value addition in the sector.
- **Low levels of production concentration and inefficiencies along the value chain**, which create information asymmetries and lower producers' bargaining power, and in turn, lower the prices they receive and increase margins for middlemen.

The PSE's price gap method is based on the underlying principle of comparing "like with like" prices, which requires adjustments for weight and quality, but also for marketing margins (processing, transportation, and handling costs).[17] However, in the absence of detailed marketing margin information, it is difficult to factor in all these value chain characteristics into the calculations, which may, in turn, distort the MPS estimates.

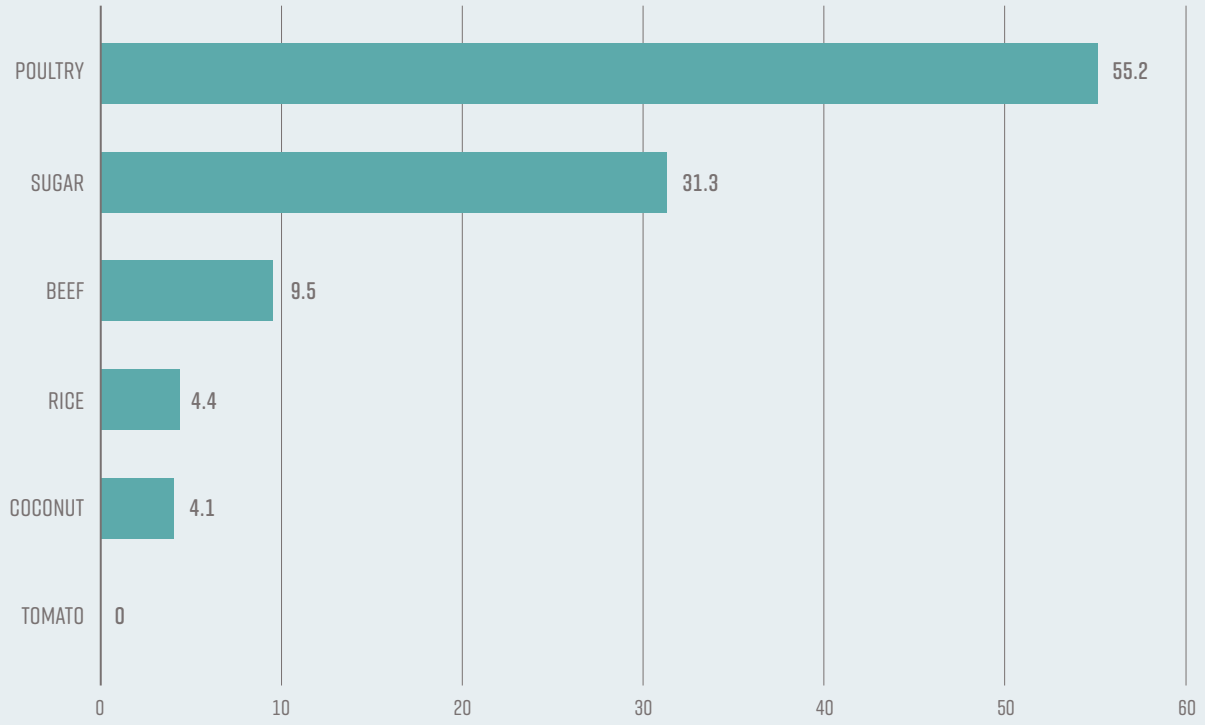
As shown in **Table 7**, between 2015 and 2019, the poultry subsector continued to receive most of the MPS (67%). Over the period of study, it is the only subsector in which producers consistently received higher prices than they would have gotten in the absence of any public policy, which is consistent with explicit public policies in place at the time (the 100% import duty on poultry meat, in particular). For rice, the price gap was negative in 2015, then positive between 2016 and 2019. As discussed in more detail below, price gaps were set to zero for the other commodities when no associated explicit public policies were identified, as suggested by the PSE methodology.

The rice and sugar subsectors were the only ones to receive commodity-specific support through budgetary transfers between 2015 and 2019. For the remaining subsectors, the SCT equaled the MPS. As presented in **Figure 11**, between 2015 and 2019, the average SCT ranged from 0% for the tomato subsector to +55.2% for the poultry subsector.

The MPS and SCT indicators are discussed in more depth in the rest of this section.

17. OECD (2010). OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculations, Interpretation and Use (The PSE Manual). Paris, France.

FIGURE 11: PRODUCERS AVERAGE SCT IN GUYANA (%), 2015-2019



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

RICE SUBSECTOR POLICY ANALYSIS

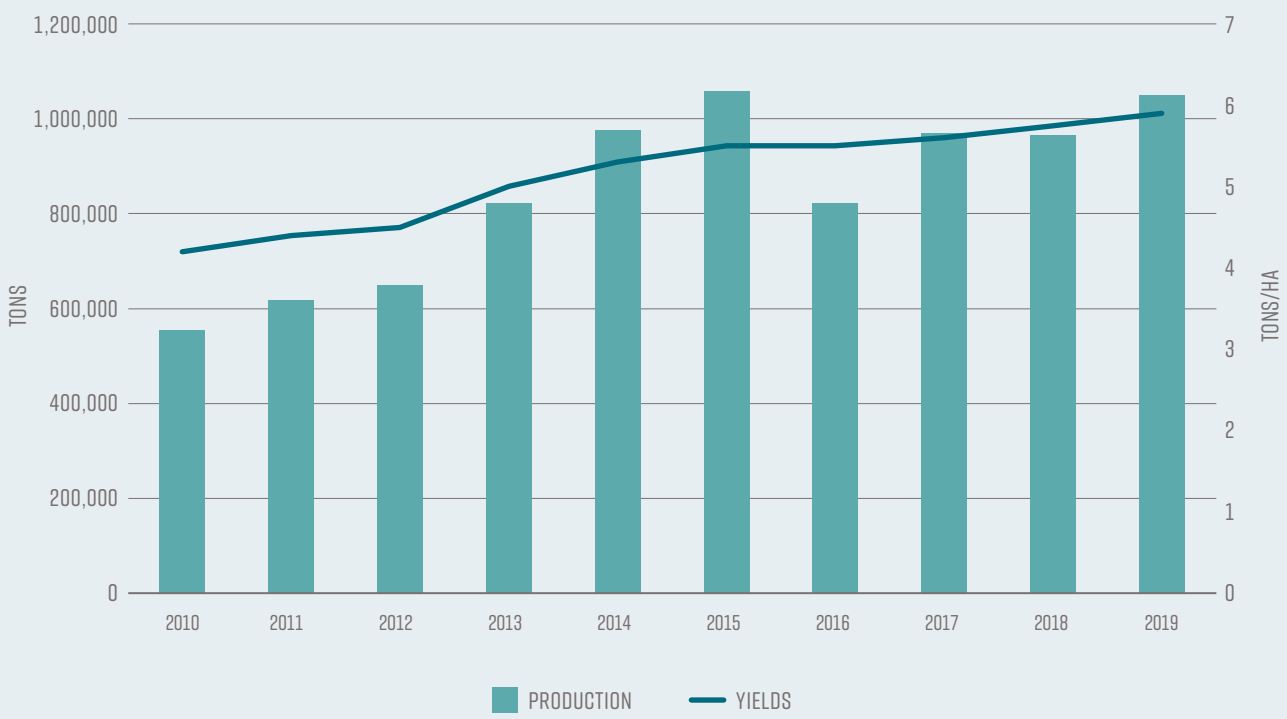
Since 2014, rice has become Guyana's main agricultural product. As of 2019, rice paddy represents 37.9% of Guyana's total agricultural production value, followed by poultry which stands at 16.3%. There are approximately 6,000 rice producers in Guyana, most of whom are small-scale farmers.[18] Rice production reached its highest annual level to date in 2015 (1,058,129 tons), before dropping by 22% in 2016. The drop in production observed between 2016 and 2017 is associated with a decrease of 4% in the area dedicated to rice production, caused by several factors including drought, saltwater intrusion, and lower input use (lower world prices of rice might have discouraged rice producers from applying rice inputs).[19] The subsector then recovered and produced

18. Guyana Chronicle (2020). Guyana expected to rake in about US$240M from rice industry.

19. US Department of Agriculture – Foreign Agricultural Service (2017). Guyana Rice: Production Drops with Problems in First Crop Rice.

1,049,874 tons in 2019, the second-highest annual level of production to date. Over the same period, yields continued to grow steadily: from 5.5 tons per hectare in 2015 to 5.9 tons per hectare in 2019. The evolution of rice production and yields over the period 2010-2019 is presented in **Figure 12**.

FIGURE 12: RICE PADDY PRODUCTION (IN TONS) AND YIELDS (IN TONS / HA) IN GUYANA, 2010-2019

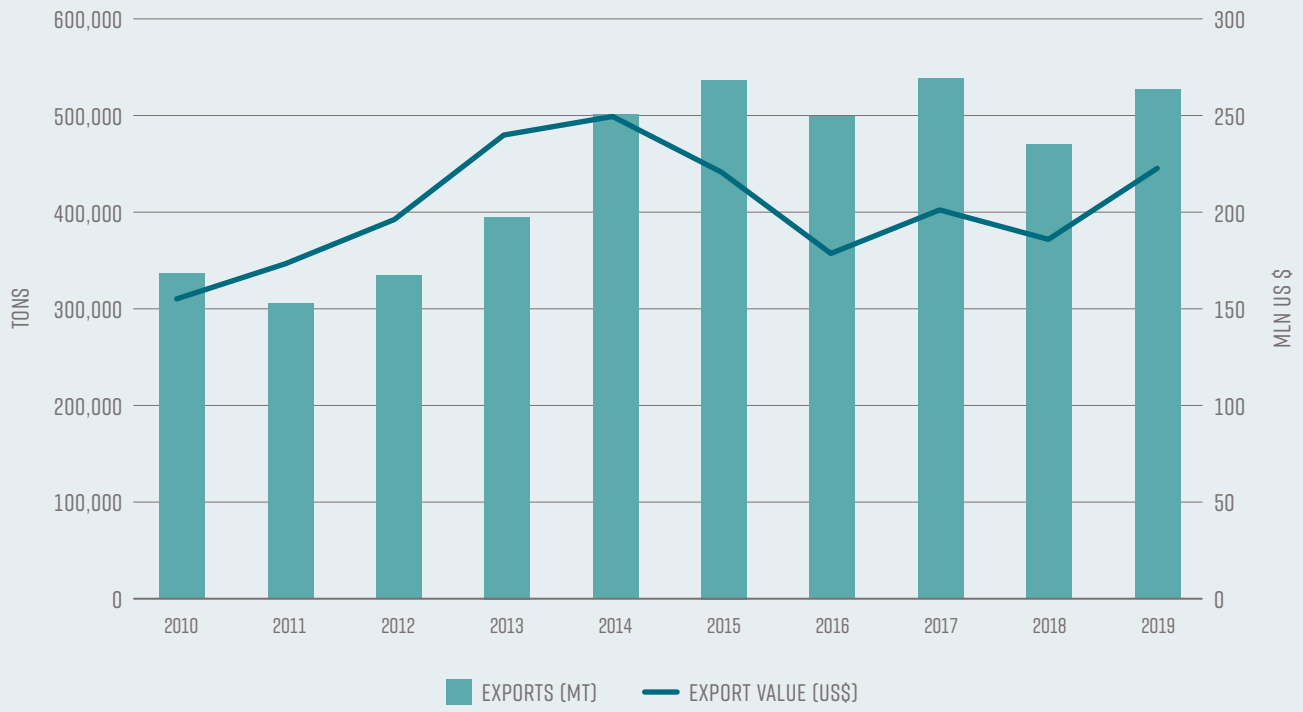


Source: Ministry of Agriculture.

Rice is Guyana's largest national export in value after gold and bauxite (or aluminum ore). The evolution of rice exports in volume and value over the period 2010-2019 is presented in **Figure 13**. Between 2015 and 2019, rice exports have been quite stable, with occasional drops in both 2016 and 2018. In 2019, Guyana exported 51% of its rice production. Of this amount, 46% was exported to Latin American countries, 41% to the EU (mainly to Portugal, Italy, Spain, and the United Kingdom), and 13% to CARICOM countries.[20] Exports to Venezuela, which came to a halt in 2015, resumed in 2016 and in 2019, Venezuela became once again the largest buyer of rice from Guyana (accounting for 34% of all exports in 2019). In the meantime, Guyana began shipping rice to both Mexico and Cuba in 2017.

20. Ministry of Agriculture (2020). Exports of Rice Earned More than US$222 Million in 2019.

FIGURE 13: RICE EXPORTS IN VOLUME (IN TONS) AND VALUE (IN MILLION US$) FROM GUYANA, 2010-2019



Source: Ministry of Agriculture.

Between 2015 and 2019, the rice subsector continued to be supported through several public policies such as tax concessions, infrastructure investments, research and development, and extension. The Guyana Rice Development Board (GRDB) is the authority within the Ministry of Agriculture responsible for providing support to rice producers through marketing and trade facilitation, quality control, research and development, technology transfer, and extension services.[21] Regarding to the extension services, GRDB employs between 80 and 100 extension agents in all the major rice-producing regions, who are in charge of providing extension services to farmers on seed rates and treatment, fertilizer management, weed management, water management, and pest and disease management.[22] GRDB's research farms also work on the development of improved seed varieties, resistant to different rice pests and diseases. An agreement was signed in 2018 with the Malaysian Agricultural Research and Development Institute for the development of three new high-yield, pest resistant, and

21. US department of Agriculture – Foreign Agricultural Service (2018). Guyana's Rice Sector Boosting Export Opportunities.

22. Ibid.

disease-resistant varieties of rice, which are expected to increase total yield by an average of 5% per annum over the subsequent three years.[23] All the activities and services provided by the GRDB are funded through a direct levy that applies to both exports and domestic sales. The fee amounts to US$ 8 per ton of white rice, US$ 4 per ton of paddy and US$ 2 per ton of rice by-product.

While the subsector's overall trend remained positive, rice growers still face several significant challenges exacerbated by the impact of climate change. Saltwater intrusion caused by sea-level rise and stronger storm surges is a growing concern that has pushed the Government to give more consideration to the expansion of rice production away from coastal regions.[24] Similarly, aging drainage canals and field access roads are increasingly unable to cope with heavy rains.[25]

Between 2015 and 2019, rice growers have received both higher prices (in 2016, 2017, 2018 and 2019) and lower prices (in 2015) than the reference price. Overall, support estimates over the period 2015-2019 indicate that the rice subsector policy's effects were positive from producers' point of view (average SCT of 4.4%).

SUGAR SUBSECTOR POLICY ANALYSIS

Between 2015 and 2019, the sugar industry remained on a steep downward trend. Production of sugarcane fell by 63%, from 2.8 million tons per year in 2015 down to 1 million tons per year in 2019 **(Figure 14)**. The industry went from being the second largest contributor to the total agricultural production value in 2015 (17.9%) to the fifth rank in 2019 (6.6%). Exports of brown sugar have also declined by 63% over the same period **(Figure 15)**. The decline of the subsector can be explained by different factors such as high production costs and operational inefficiencies in most sugar estates and factories.[26] Cane yields have also been stagnating at an average of 55 tons per hectare between 2015 and 2019 **(Figure 14),** which is significantly lower than LAC's leading sugar producers such as Mexico (74 tons per hectare) and Guatemala (108 tons per hectare). At the same time, the sugar industry suffered from diminishing global demand but particularly due to the abolishment of the EU Sugar Protocol. In 1975, Guyana, along with

23. Department of Public Information Government of Guyana, (2018a). "Growth in Guyana's Agriculture Sector Expected".

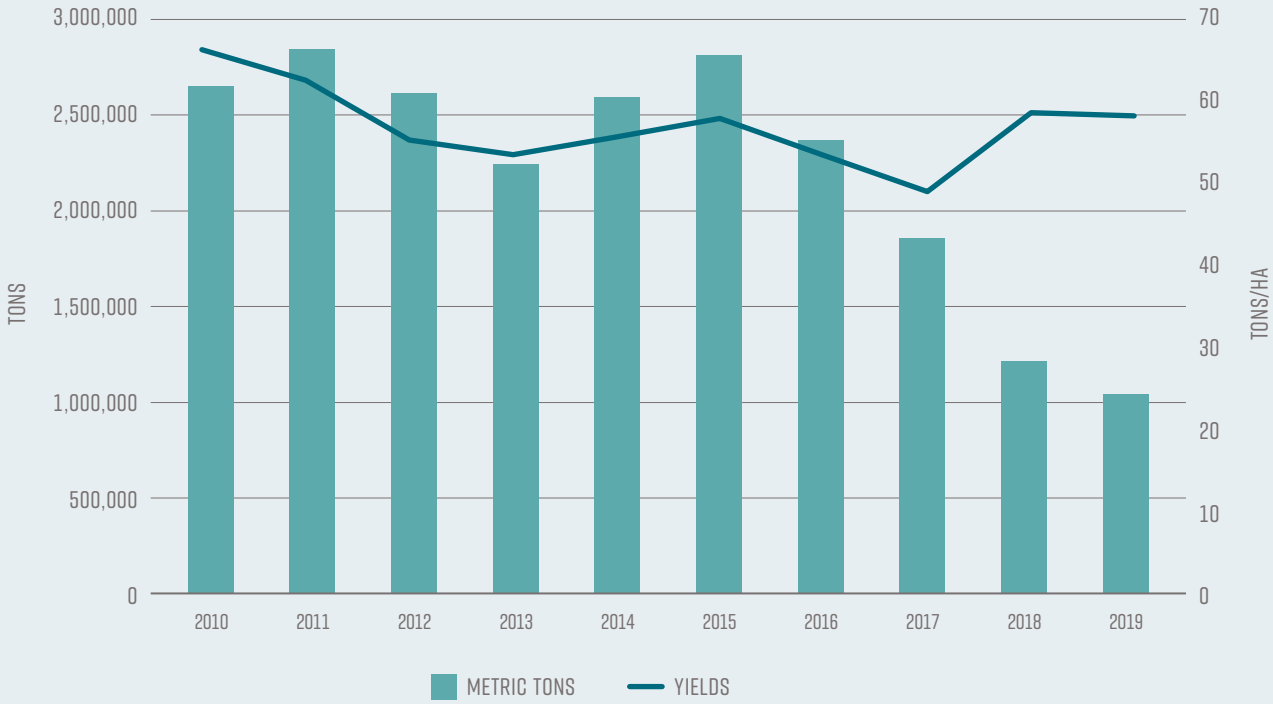
24. US department of Agriculture – Foreign Agricultural Service (2018). Guyana's Rice Sector Boosting Export Opportunities.

25. Ibid.

26. Caribbean Council (2019). The last change for CARICOM sugar?

other African, Caribbean and Pacific (ACP) countries, was guaranteed preferential prices for its sugar exports to the EU market, under the EU Sugar Protocol. However, starting in 2006, the EU gradually started to eliminate this preferential treatment. First, the gap between ACP and world prices was reduced in 2009. Then, in 2017, guaranteed sugar quotas were abolished.

FIGURE 14: SUGAR CANE PRODUCTION (IN TONS) AND YIELDS (IN TONS / HA) IN GUYANA, 2010-2019



Sources: Ministry of Agriculture and FAOSTAT.

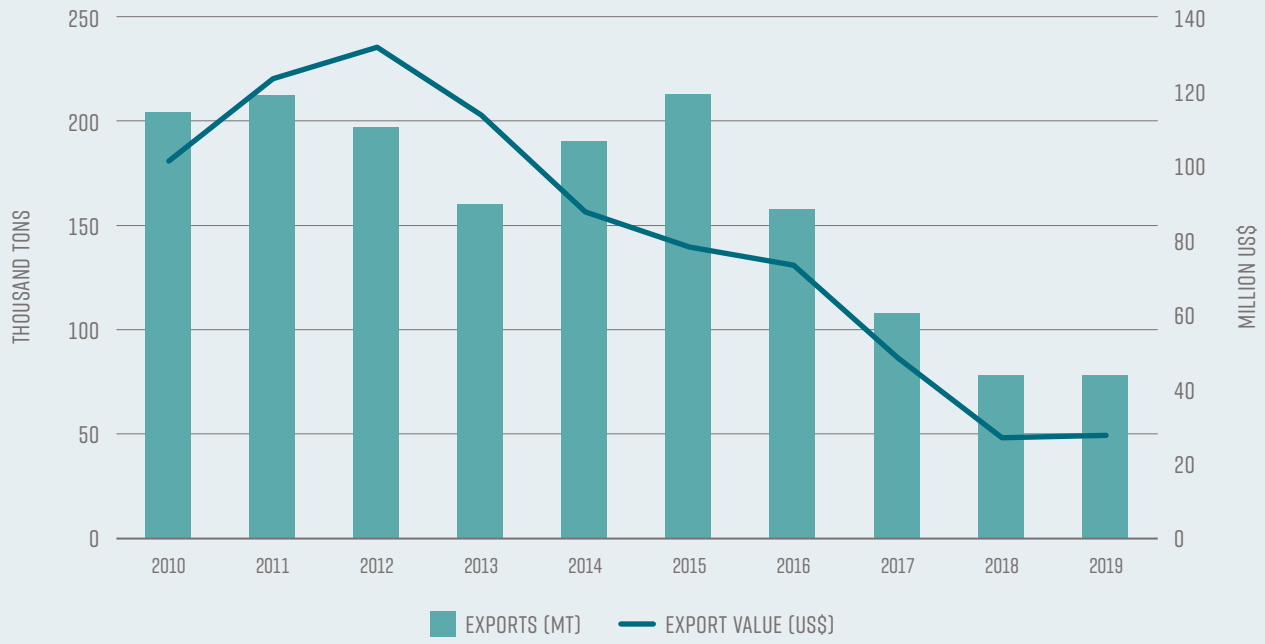
The sugar sub-sector remains of socio-economic importance to Guyana as it provides a source of income to an estimated 150,000 people.[27] It is still dominated by the Government-owned GuySuCo, which is the country's largest cultivator and producer of brown sugar, and the only state-trading company authorized to import and export sugar (other companies may import sugar but only under a non-automatic license system).[28]

In the face of the sugar industry's challenges, a number of steps have been taken to restructure it. The creation of a 'Sugar Task Force' by the Government following the presentation of the

27. Sugar Association of the Caribbean (2018). Reforming the CET for a sustainable future for the Caribbean Sugar Industry.

28. WTO (2016). Trade Policy Review – Report by the Secretariat – Guyana.

FIGURE 15: BROWN SUGAR EXPORTS IN VOLUME (IN THOUSAND TONS) AND VALUE (IN MILLION US$) FROM GUYANA, 2010-2019



Source: Guyana Bureau of Statistics.

"State Paper on the Future of the Sugar Industry" by the Ministry of Agriculture to the Parliament in 2017 has laid down a three-year plan for the restructuring of the sugar sub-sector following the removal of the EU Sugar Protocol.[29]

As part of this plan, between 2017 and 2018, the Government closed half of GuySuCo-operated estates and factories, and put them for sale, which led to the laid-off of an estimated 4,000 employees.[30] The remaining estates and factories were expected to produce approximately 147,000 tons of brown sugar annually, in order to satisfy the local market (25,000 tons), CARICOM markets (50-60,000 tons), the United States of America (USA) market (12,500 tons) and EU markets (50,000 tons).[31] However, between 2017 and 2019, this target was never met. Over that period, the production of brown sugar actually dropped by 37%, from 137,307 tons per year in 2017 down to 86,841 tons in 2019. As of 2019, GuySuCo supplies the local market with 25,000 tonnes of brown sugar, CARICOM with about 30,000 tonnes, the USA with

29. GUYSUCO, (2018). Business Strategy 2018-2020/2021.

30. Guyana Chronicle (2020b). GuySuCo aims to produce over 150,000 tonnes of sugar annually.

31. Ibid.

12,000-14,000 tonnes under the Tariff Rate Quotas (TRQ), and the rest is sold to the EU at world market prices.[32]

In 2006, the Government of Guyana began subsidizing GuySuCo to compensate for its losses.[33] Between 2011 and 2018, the Government of Guyana transferred a total of GY$ 51 billion to GuySuCo **(Table 8)**, with minor conditions.[34] On average, over that period, this annual budgetary transfer amounted to 44% of the Ministry of Agriculture's total annual budget. But in 2019, as part of its restructuring plan, the Government decided to stop subsidizing GuySuCo.

TABLE 8: GOVERNMENT TRANSFERS TO GUYSUCO, 2011-2019, IN GY$ MILLION

YEAR	GY$
2011	659
2012	4,000
2013	5,360
2014	6,000
2015	6,073
2016	11,000
2017	9,000
2018	9,000
2019	-
TOTAL	51,092

Source: Ministry of Finance.

Since 2009, the Government of Guyana has also supported GuySuCo by waiving its loan repayment obligations for the modernization of the Skeldon Sugar Processing Plant (US$ 8 million per year).[35]

Concerning thee trade policy, the 40% CET described in **Table 5** continues to be waived for imports of white sugar, which amount to approximately 20,000 tons per year and represent an essential

32. Ministry of Agriculture (2019). GuySuCo Accelerates its Engagements onWhite Sugar Production.

33. WTO (2016). Trade Policy Review – Report by the Secretariat – Guyana.

34. Ibid.

35. WTO (2016). Trade Policy Review – Report by the Secretariat – Guyana.

input for manufacturers of food and drinks.[36] GuySuCo is aiming at starting to produce white sugar at the Albion Estate in early 2022.[37]

Because GuySuCo remains the largest sugar producer and the only exporter in Guyana, at prices that depend entirely on international market prices, the MPS is set at zero (Derlagen, 2017). However, with the sizeable direct budget transfers to GuySuCo, which occurred between 2015 and 2018, support estimates over the period 2015-2019 indicate that the sugar subsector policy's effects remained significant (average SCT of 31.3%; **Figure 11**).

NONTRADITIONAL CROPS POLICY ANALYSIS

Non-traditional crops refer to crops other than rice and sugar. The National Agriculture Development Strategy (2013-2020) puts a strong emphasis on diversification (beyond rice and sugar) and thus seeks to promote various fruits and vegetables, such as coconut and tomatoes, through the provision of extension services, fertilizers, irrigation and access to roads.[38] As part of this strategy, Guyana also signed protocols for exporting fruits and vegetables to other Caribbean countries, particularly to Barbados.[39]

About coconut, between 2015 and 2019, nurseries were initiated in three locations across the country, at Mon Repos, Wakenaam, and the Pomeroon, for the expansion of the industry with increased emphasis on the production of valuable products such as coconut water and virgin coconut oil. Similarly, through the National Agriculture Research and Extension Institute (NAREI), the Government has also worked on developing new and more productive crop varieties.

The MPS for coconut was positive in 2015, which is consistent with explicit public policies in place at the time (the 40% import duty on coconut, in particular). It then became negative for the remaining years (2016-2019), despite the absence of policy changes that could explain this reversal. The MPS for coconut is thus set to zero for the period 2016-2019. With an average SCT of 4.1%, the coconut subsector policy's effects between 2015 and 2019 were slightly positive from the producers' point of view.

36. Stabroek News (2019a). No 40% CARICOM tariff on white sugar until regional producers can supply – Dookhoo.

37. Ministry of Agriculture (2019). GuySuCo Accelerates its Engagements on White Sugar Production.

38. WTO (2016). Trade Policy Review – Report by the Secretariat – Guyana.

39. Derlagen (2017).

With respect to tomatoes, the data indicates a significant price gap in favor of domestic producers.[40] However, it far exceeds the potential impact that explicit public policies in place at the time (the 40% import duty on tomato, in particular) could have had and the MPS for tomato is thus set to zero. Overall, support estimates over the period 2015-2019 indicate that the tomato subsector policy's effects were neutral (average SCT of 0%).

LIVESTOCK SUBSECTOR POLICY ANALYSIS

Between 2015 and 2019, poultry remained Guyana's most important livestock commodity. Over that period, poultry production increased by 26%, from 30,678 tons per year in 2015 to 38,729 tons per year in 2019, while imports dropped from 579 tons down to 128 tons. Domestic poultry producers continue to be protected by the 100% tariff on poultry imports **(Table 5)** and the VAT exemption granted to domestically produced chicken. The growth in domestic production has been driven by an increase in domestic demand.[41] Poultry exports, on the other hand, have peaked in 2015 (10.87 tons of poultry exported) before going down and reaching zero in 2019. Despite the opportunity offered by CARICOM's large poultry market, sanitary and phytosanitary requirements continue to hold back Guyana's poultry exports[42] In 2019, for instance, Trinidad temporarily banned poultry imports from Guyana as a result of the presence of Duck virus hepatitis in parts of the country.[43]

With respect to beef, the production also increased from 2,282 tons per year in 2015 to 2,828 tons per year in 2019 (an increase of 24%). Beef imports also increased from 20 tons per year in 2015 to 94 tons per year in 2019, mainly in the form of premium cuts for the hospitality trade.[44] The lack of abattoir in compliance with international standards has long been recognized as the main constraint preventing local beef producers from matching the quality of imported cuts.[45] At the end of 2018, the Ministry of Agriculture

40. It is worth mentioning that farm gate prices of tomatoes used in the present analysis (FAOSTAT) are significantly higher than in other countries of the region such as Mexico.

41. CEPAL (2019). Economic Survey of Latin America and the Caribbean – Guyana.

42. Ibid.

43. Stabroek News (2019b). Trinidad bans cooked and raw poultry from Guyana over duck hepatitis.

44. GLDA (2019). 2019 Annual Report.

45. News Room (2018). Modern US$2.5M abattoir could end beef imports.

announced that the construction of a modern abattoir would be completed in 2020, for a cost of US$ 2.5 million.[46]

The Guyana Livestock Development Authority (GLDA) is the agency within the Ministry of Agriculture responsible for providing support to the livestock sub-sector through the provision of services in livestock husbandry, health, research, as well as in disease surveillance and control, veterinary care, and trade regulation (including the issuance of import permits).

In 2017, with the financial support of the IDB, the Government launched the Sustainable Agriculture Development Programme. The Programme has allocated funds for the development of research stations in Pirara and Lethem and the expansion of the existing one in Ebini. Once completed, the Pirara station will consist of facilities for research on cattle, poultry, orchards, and seed stock, while the stations at Lethem and Ebini will facilitate research on cassava, peanuts, orchards, pastures, and livestock development.[47]

The MPS for beef was negative in 2015, 2016 and 2019, and positive in 2017 and 2018. While the existing 40% duty could explain the positive MPS on beef imports, the causes of the negative MPS in the remaining years are unclear. It is likely to be the consequence of implicit non-policy effects such as the lack of abattoir in compliance with international standards and other inefficiencies along the beef value chain. As a result, the MPS for beef is set to zero in years 2015, 2016 and 2019. With an average SCT of 9.5% between 2015 and 2019, the beef subsector policy's effects were slightly positive from from the producers' point of view.

As described above, between 2015 and 2019, the poultry subsector continued to receive most of the MPS in Guyana (67%). The MPS for poultry is directly related to the 100% import tariff in place to shield domestic producers from cheaper poultry meat imports. The impact of this policy is significant for domestic consumers who end up paying higher prices for poultry meat than international prices. Overall, support estimates over the period 2015-2019 indicate that the poultry subsector policy's effects remained large and significant (average SCT of 55.2%; **Figure 11**).

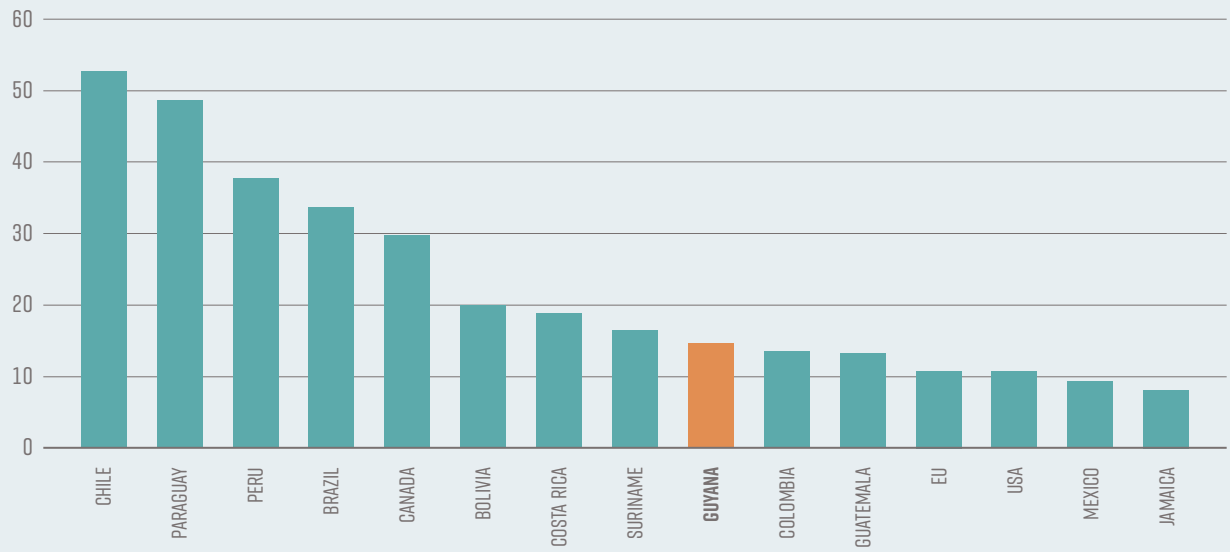
46. Ibid.

47. Department of Public Information Government of Guyana, (2018b). Design Phase of Research Station Almost Complete.

2.3.3. ESTIMATES OF SUPPORT TO GENERAL SERVICES

General Services Support Estimate (GSSE) measures budget transfers for services provided to producers collectively. Guyana's GSSE reached GY$ 4.8 billion in 2019 **(Table 7)**. As a share of the Total Support Estimate (TSE), the percentage GSSE (%GSSE) was 19% in 2015, 11% in 2016, 10% in 2017 and 12% in 2018. In 2019, it rose back to 19%, mainly as a result of the end of direct budget transfers to GuySuCo which significantly lowered the value of the PSE. With an average %GSSE of 14% over the period of study, Guyana ranks between Colombia (13.5%) and Suriname (16%) **(Figure 16)**.

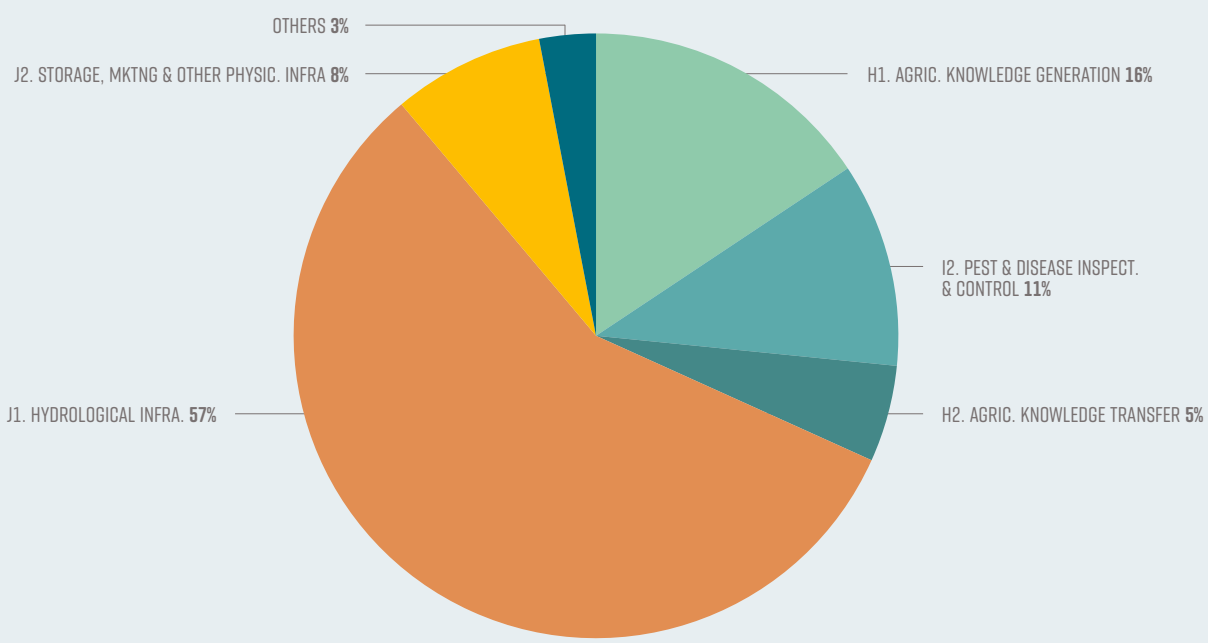
FIGURE 16: AVERAGE %GSSE IN GUYANA AND IN SELECTED COUNTRIES, 2015-2019



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics, FAOSTAT and Agrimonitor.

The average composition of Guyana's GSSE over 2015-2019 is shown in **Figure 17**. 57% of the GSSE consisted of support for developing and maintaining hydrological infrastructure (J1), primarily through the National Drainage and Irrigation Authority. It was followed by support to agricultural knowledge generation (16%; H1) through research activities conducted by the National Agricultural Research and Extension Institute (NAREI) and GRDB, and by support for pest and disease inspection and control (11%; I2), mainly through NAREI's investment in plant protection.

FIGURE 17: AVERAGE GSSE COMPOSITION IN GUYANA, 2015-2019



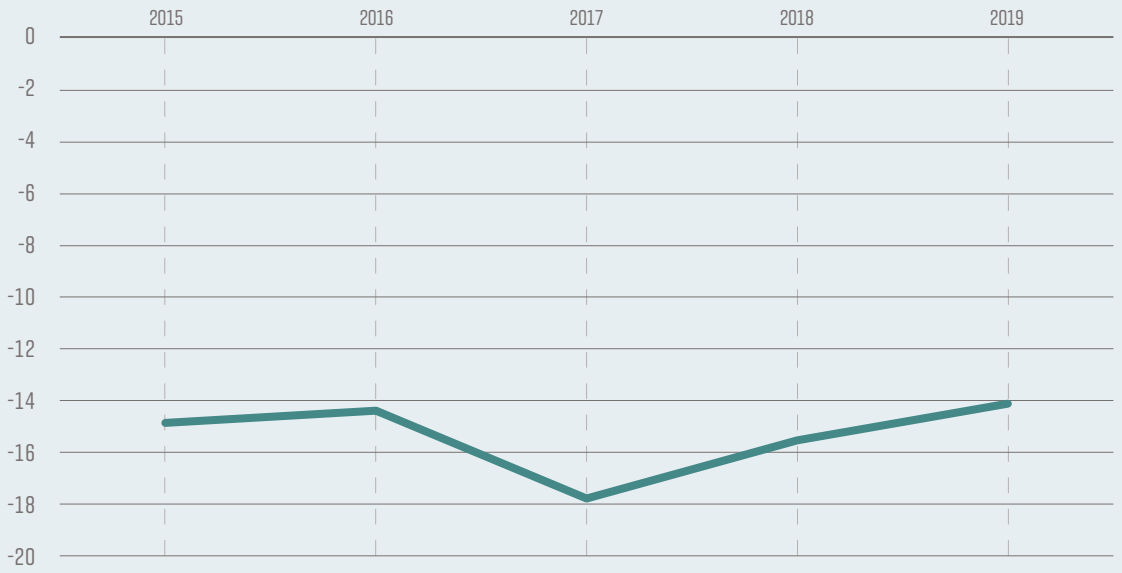
Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

2.3.4. ESTIMATES OF SUPPORT TO CONSUMERS

Guyana's Consumer Support Estimate (CSE) reached GY$ –11.7 billion in 2019, which indicates that support to producers in Guyana continued to be financed primarily by transfers from consumers **(Table 7)**. In other words, Guyanese consumers pay higher prices for agricultural commodities as a result of Government policies, which might have negative implications for food security. The main driver of this negative CSE is the protection provided to poultry farmers. As illustrated in **Figure 18**, over the period 2015-2019, Guyana's negative percentage CSE (%CSE; the CSE expressed as a share of total consumption expenditures, at farmgate, net of taxpayer transfers to consumers) ranged between 18% in 2015 and 14% in 2019. This level is quite consistent with trends observed in other lower middle-income countries **(Figure 19)**.

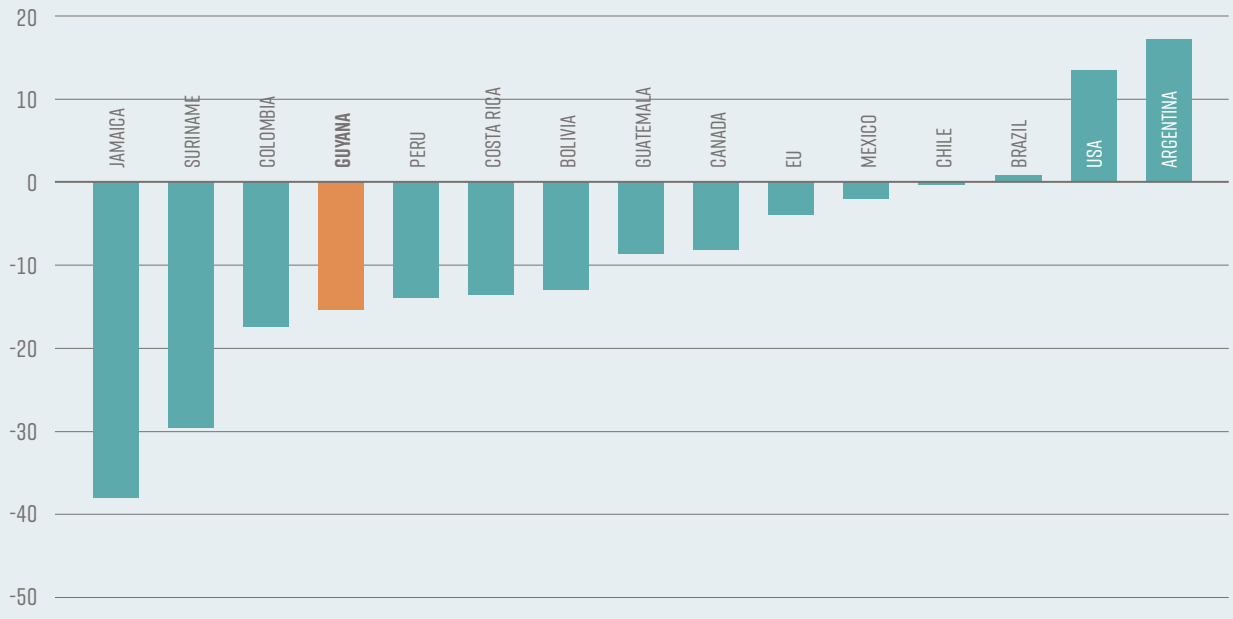
In most OECD countries, consumers are taxed as well, but budget transfers through food assistance programs usually partially compensate for this. Guyana's School Feeding Program does create transfers from taxpayers to consumers and has grown significantly from GY$ 625 million in 2015 to GY$ 3.4 billion in 2019. However, it is still too small to compensate for the higher prices paid by Guyanese consumers.

FIGURE 18: %CSE IN GUYANA, 2015-2019



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

FIGURE 19: AVERAGE %CSE IN GUYANA AND IN SELECTED COUNTRIES, 2015-2019

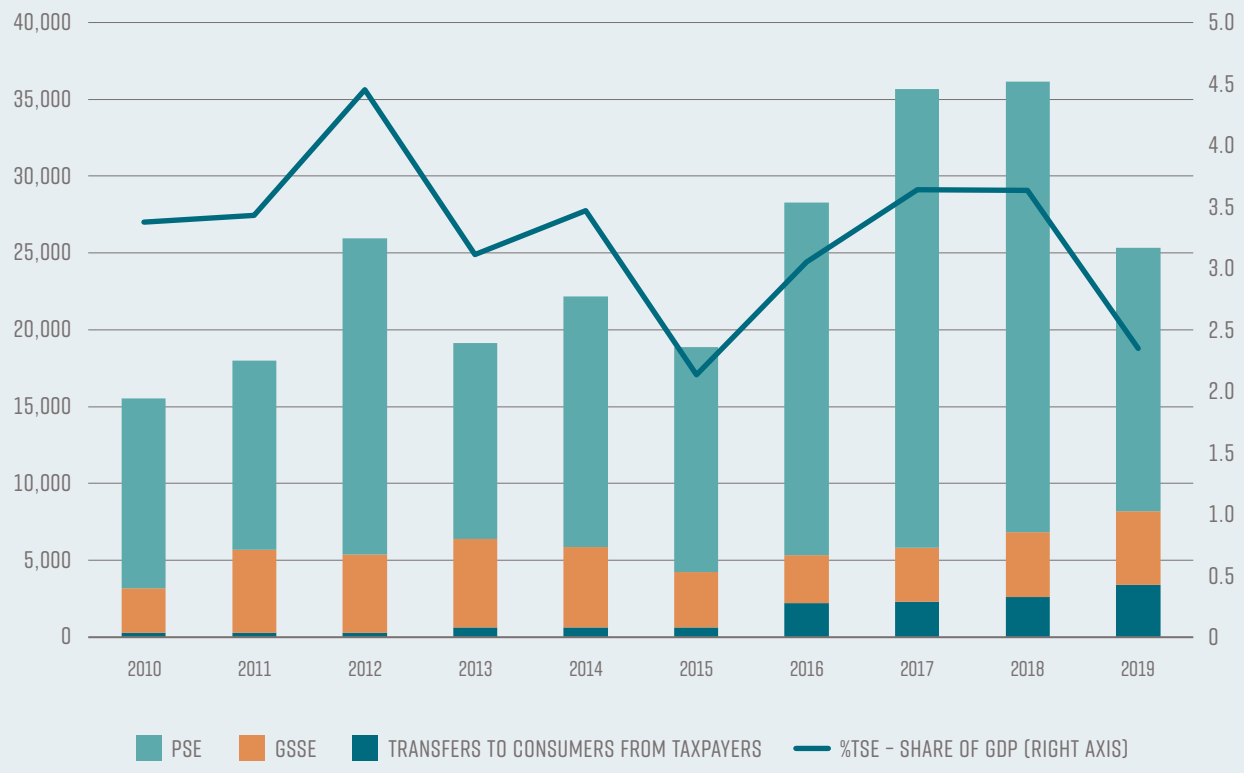


Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics, FAOSTAT and Agrimonitor.

2.3.5. ESTIMATES OF TOTAL SUPPORT TO AGRICULTURE

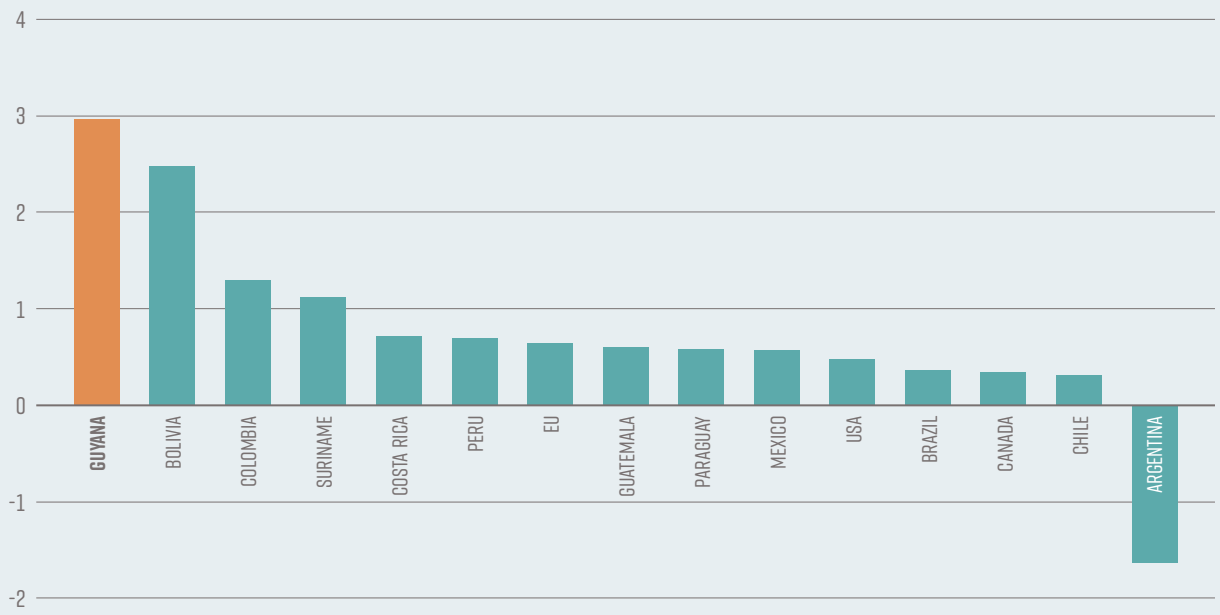
The Total Support Estimate (TSE) is the sum of the PSE, the GSSE, and transfers to consumers from taxpayers. Between 2015 and 2019, Guyana's percentage TSE (%TSE; the TSE expressed as a share of GDP) increased slightly from 2.1% to 2.3% **(Figure 20)**. In absolute terms, the total support to the sector in Guyana also increased from GY$18.9 billion in 2015 to GY$ 25.3 billion in 2019. Compared to other countries, Guyana's average level of sector support over the period 2015-2019 was the highest in the region **(Figure 21)**.

FIGURE 20: TSE COMPOSITION IN GY$ MILLION, 2010-2019



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics and FAOSTAT.

FIGURE 21: AVERAGE %TSE IN GUYANA AND IN SELECTED COUNTRIES, 2015-2019



Source: Author's estimations based on data from the Ministry of Agriculture, the Bureau of Statistics, FAOSTAT and Agrimonitor.

3. GREENHOUSE GAS EMISSIONS AND AGRICULTURAL POLICY

3.1. INTRODUCTION

This chapter aims to discuss **the relationship between commodity-specific policies discussed above and the environmental impact of these commodities**. In other words, it shed light on the impact of agricultural policies in Guyana on greenhouse gas (GHG) emissions. The Government of Guyana has an obligation to communicate GHG emission levels to the United Nations (UN) under the UN Framework Convention on Climate Change (UNFCCC) provisions. Guyana's Second and latest National Communication took place in September 2012 and provides data on GHG field emissions (excluding operational emissions) by sectors in the country up to 2004.

According to this document, Guyana is a net sink for GHG, thanks to its extensive tropical forests. It estimates that in 2004, these forests absorbed almost 60,000 gigagrams (Gg) of carbon dioxide (CO_2), while the country emitted approximately 3,330 Gg of CO_2 (including non-CO_2 emissions expressed in CO_2 equivalent Through energy generation and transport, the energy sector emitted approximately 1,657 Gg of CO_2 (50% of the country's total CO_2 emissions). Guyana's non-CO_2 emissions, on the other hand, were derived mainly from the agricultural sector and were equivalent to 1,274 Gg of CO_2 (38% of the country's total CO_2 emissions).

3.2. METHODOLOGY

The methodology has been developed by the IDB and Professor Tim Josling.[48] It is the first time that it is applied to Guyana. Data on GHG field emissions comes from Guyana's Second and latest National Communication, in the absence of more recent data. It is then matched with data on policy transfers, using the Producer Single Commodity Transfer (SCT) indicators estimated previously (SCT measures commodity-specific transfers, which provide direct incentives to produce that particular commodity).

The matching of GHG field emission data with policy transfers is an estimation, whose precision is, by definition, limited.[49] Emissions are indeed dependent on farming practices and other conditions that can vary, and the policy incidence depends on the market conditions as well as the details of policy administration. However, the results presented in this study do still provide a starting point for more detailed research into the relationship between agriculture policy and climate change.

MAIN ASSUMPTIONS

GHG emissions data: Data on GHG field emissions from Guyana's Second and latest National Communication is not presented by commodity but instead grouped by categories, as shown in **Table 9**. Since data on GHG field emissions are only provided up to 2004, it is assumed that emissions for each category grow at the same yearly rate as the production of the main crop or livestock that generates them. Using this approach, total annual

48. Josling, T. et al. (2017). *Agricultural Policy and Greenhouse Gas Emissions in Jamaica.* IDB Agricultural Policy Report.

49. This is why GHG emissions data is here presented as an average over several years, instead of per year.

GHG field emissions from agriculture are estimated for the period 2015-2019 and the annual average over the same period is presented in **Table 10**. Total field emissions from agriculture are estimated at 1,759.58 Gg CO_2 equivalent (eq.) per year, on average, for the period 2015-2019 in the present study. Of the latter, the main contributors are methane (CH4) emissions from the flooding of rice fields (64% of total crop and livestock emissions) and from enteric fermentation in animals (21%).

TABLE 9: LIST OF EMISSION CATEGORIES

LIVESTOCK	
ENTERIC FERMENTATION	CH4, CO2 eq. (Gg)
MANURE MANAGEMENT	CH4, CO2 eq. (Gg)
AGGREGATE SOURCES	
FIELD BURNING OF AGRICULTURAL RESIDUES	CH4+NO2, CO2 eq. (Gg)
PRESCRIBED BURNING OF SAVANNAHS	CH4, CO2 eq. (Gg)
DIRECT NITROUS OXIDE (N20) EMISSIONS - HISTOSOLS	N2O, CO2 eq. (Gg)
INDIRECT N20 EMISSIONS - ATMOSPHERIC DEPOSITION AND LEACHING	N2O, CO2 eq. (Gg)
RICE CULTIVATIONS - FLOODED	CH4, CO2 eq. (Gg)

Source: Government of Guyana (2012)

TABLE 10: TOTAL FIELD EMISSIONS FROM AGRICULTURE

LIVESTOCK		ANNUAL AVERAGE 2015-19
ENTERIC FERMENTATION	CH4, CO2 eq. (Gg)	375.19
MANURE MANAGEMENT	CH4, CO2 eq. (Gg)	9.38
AGGREGATE SOURCES		
FIELD BURNING OF AGRICULTURAL RESIDUES	CH4+NO2, CO2 eq. (Gg)	98.91
PRESCRIBED BURNING OF SAVANNAHS	CH4, CO2 eq. (Gg)	19.23
DIRECT N20 EMISSIONS - HISTOSOLS	NO2, CO2 eq. (Gg)	47.18
INDIRECT N20 EMISSIONS - ATMOSPHERIC DEPOSITION AND LEACHING	NO2, CO2 eq. (Gg)	83.12
RICE CULTIVATIONS - FLOODED	CH4, CO2 eq. (Gg)	1126.57
TOTAL	**Gg CO2 eq.**	**1,759.58**

Source: Author's own calculations using data from Government of Guyana (2012)

Allocation of GHG field emissions to PSE commodities: Using the approach described in Josling (2017), total GHG field emissions from agriculture are converted from the categories set out in Guyana's Second and latest National Communication to individual PSE commodities, in order to facilitate the matching with SCT indicators. GHG field emissions by individual PSE commodities are presented in **Table 11** and are estimated at 1,589.62 Gg CO_2 equivalent per year, on average, for the period 2015-2019. The subsector that emits the most is rice (73.7% of total crop and livestock emissions), followed by beef (12.8%) and sugar (8.4%).

TABLE 11: GHG FIELD EMISSIONS BY INDIVIDUAL PSE COMMODITIES

COMMODITIES		ANNUAL AVERAGE 2015-19
TOMATOES	Gg CO_2 eq.	1.14
RICE	Gg CO_2 eq.	1,201.39
SUGAR	Gg CO_2 eq.	137.41
BEEF	Gg CO_2 eq.	208.44
POULTRY	Gg CO_2 eq.	37.01
COCONUT	Gg CO_2 eq.	4.22
OTHER (NON-PSE) PRODUCTS	Gg CO_2 eq.	40.77
TOTAL	**Gg CO_2 eq.**	**1,630.39**

Source: Author's own calculations using data from Government of Guyana (2012)

Sequestration of GHG emissions by agricultural products: The positive contribution of crops, which absorb GHG, needs to be factored in. Following Josling (2017), preliminary sequestration estimates by sugar cane and coconut are incorporated.

Carbon pricing: A carbon price is required in order to be able to compare the cost of GHG emissions to the cost of financial transfers to producers of specific commodities. In the absence of a single carbon market, and thus price (over 40 different countries now operate carbon-pricing initiatives), two different carbon prices will be used and compared with each other: US$ 10 and US$ 45 per metric ton of carbon dioxide.

3.3. RESULTS

The first results of this analysis are presented in **Table 12**. In terms of the value of output (or production), the selected PSE commodities are dominated by rice (34% of the total value of agricultural production), followed by poultry (15%) and sugar (12%). The column SCT reflects policy priorities: most of the support goes to poultry (45%), in the form of price support, then to sugar (33%), mainly through direct budget transfers to GuySuCo, and lastly to rice (8%), primarily in the form of price support.

As described above, the subsectors with the highest GHG field emissions are rice (73.7%), beef (12.8%), and sugar (8.4%). As shown in **Table 10**, CH4 emissions from the flooding of rice fields are the largest source of agriculture-related GHG field emissions in Guyana. As a result, the rice subsector accounts for 73.7% of GHG field emissions, despite contributing to 33.7% of the production value. Similarly, because of cattle's enteric fermentation, the beef subsector accounts for 12.8% of GHG field emissions, despite contributing to only 1.6% of the production value. Conversely, the remaining subsectors, including sugar, contribute less to GHG field emissions than their shares in the total value of production.

Agricultural carbon emissions (ACE) are expressed in monetary value. They include direct GHG field emissions from livestock and crop cultivation and operational emissions associated with the use of fuel and energy inputs in field operations, harvesting, and processing (estimated here using the approach described in Josling, 2017). In addition, it accounts for carbon sequestration. The picture that ACE gives is not so different from the GHG column, except when it comes to coconut. The coconut subsector's ACE share is negative (–1.5%), because it is estimated that coconut trees sequestrate more carbon than they emit.

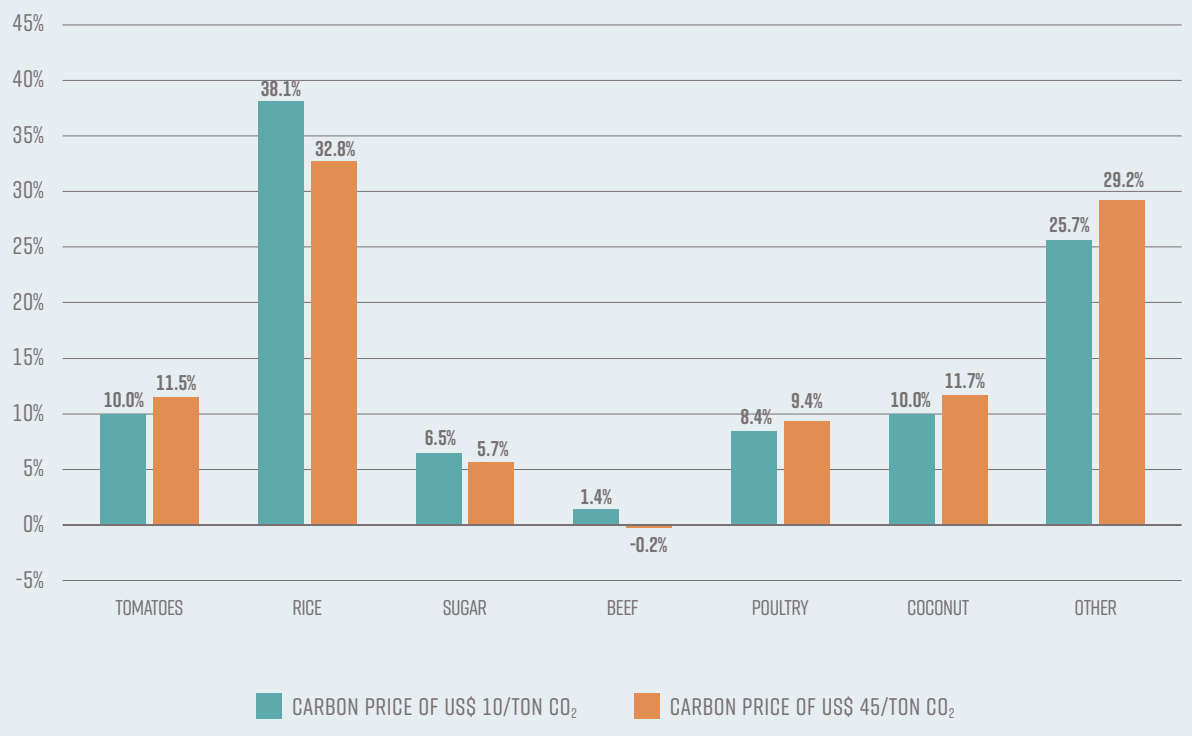
The Net Social Value (NSV) is the total production value net of both the cost of carbon emissions (ACE) and transfers through agricultural policies (SCT). If producers had to pay for the GHG emissions associated with the commodities they produce and were not receiving any transfers through commodity-specific policies, the total production value would be equal to the NSV. **Figure 22** shows the NSV shares for the PSE commodities, using two different carbon prices (per metric ton): US$ 10 and US$ 45. The PSE commodity with the largest NSV, no matter the carbon price level, is rice, despite being also the highest emitter. It is then followed by coconut and tomatoes. Increasing the price of carbon from US$ 10 to US$ 45 per metric ton does not affect the overall picture. It only leads to a slight decrease in the NSV shares of the most GHG emitting commodities (rice, sugar, and beef).

TABLE 12: SHARES OF SELECTED PSE COMMODITIES IN SUPPORT AND EMISSIONS (2015-2019 AVERAGE)

	VALUE OF PRODUCTION (VOP)	SINGLE COMMODITY TRANSFERS (SCT)	GREENHOUSE GAS FIELD EMISSIONS	AGRICULTURAL CARBON EMISSIONS (ACE)
TOMATOES	7.9%	0.0%	0.1%	0.1%
RICE	33.7%	8.4%	73.7%	73.0%
SUGAR	11.5%	32.8%	8.4%	12.0%
BEEF	1.6%	0.9%	12.8%	12.0%
POULTRY	15.0%	44.9%	2.3%	2.1%
COCONUT	7.9%	0.9%	0.3%	-1.5%
OTHER	22.4%	12.0%	2.5%	2.3%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Author's own calculations using data from Government of Guyana (2012)

FIGURE 22: SHARES IN NET SOCIAL VALUE FOR DIFFERENT CARBON PRICES (2015-2019 AVERAGE)



Source: Author's own calculations using data from Government of Guyana (2012)

Table 13's last column shows the value of production, net of such transfers, divided by the ACE. The result shows how much is produced from the point of view of society (social value) per unit of environmental costs. On the other hand, rice, sugar, and beef have the lowest ratios. In other words, using a price of carbon of US$ 45 per metric ton (the overall picture, however, does not change when using a price of US$ 10 instead), while the social value of producing tomatoes is over 800 times its ACE, it is only three times for rice and sugar, and less than one for beef.

TABLE 13: GHG AND ACE PER UNIT OF COMMODITY (2015-2019 AVERAGE)

	GHG EMISSIONS	ACE				ACE AS PERCENT OF VOP		VOP-SCT/ACE	
	MET. TONS CO_2E/HA	GYD MN		GYD/HA		%		RATIO	
		US$10/T CO_2	US$45/T CO_2	US$10/T CO_2	US$45/T CO_2	US$10/T CO_2	US$45/T CO_2	US$10/T CO_2	US$45/T CO_2
TOMATOES	4.79	2.46	11.07	9,920.51	44,642.30	0.0%	0.1%	3,876.75	861.50
RICE	7.18	2,636.43	11,863.95	14,887.71	66,994.68	6.5%	29.0%	14.78	3.28
SUGAR	7.94	434.99	1,957.45	12,871.68	57,922.58	3.1%	14.0%	15.26	3.39
BEEF	N/A	432.80	1,947.62	N/A	N/A	22.2%	99.9%	4.03	0.90
POULTRY	N/A	76.83	345.75	N/A	N/A	0.4%	1.9%	105.38	23.42
COCONUT	0.62	(55.64)	(250.39)	(3,909.81)	(17,594.15)	-0.6%	-2.6%	(169.55)	(37.68)
OTHER PRODUCTS	0.17	84.49	380.20	349.80	1,574.12	0.3%	1.4%	290.54	64.56

Source: Author's own calculations using data from Government of Guyana (2012)

The main objective of this analysis is to measure the extent to which policy transfers incentivize or disincentivize GHG emissions. As shown in **Table 12**, policy support in Guyana mostly goes to the poultry subsector (45% of SCTs, on average, over the period 2015-19) and to the sugar subsector (33% of SCTs, on average, over the period 2015-19). The poultry subsector emits little. On the other hand, sugar is the crop with the highest GHG emissions per hectare, along with rice **(Table 13)**. However, its NSV is positive (even when using a carbon price of US$ 45 per ton of CO_2), and the social value of producing sugar is more than three times its environmental cost (ACE). In sum, agricultural policy transfers in Guyana are not at odd with GHG mitigation efforts. Those transfers are concentrated on two subsectors, which are not inefficient from an environmental point of view. However, it is worth mentioning that commodities that emit the least, namely tomatoes and coconut, receive little to no policy support

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

This report provides an update on the application of the Producer Support Estimate (PSE) methodology to Guyana for the period 2015-2019. Also, it documents the evolution of agricultural policies related GHG emissions over the same period.

Between 2015 and 2019, Guyana's TSE, or overall agricultural policy transfers, averaged 3% of the country's GDP, the highest ratio in the LAC region. The market price support (MPS) remained Guyana's main PSE component. Expressed as a share of the total PSE, Guyana's MPS averaged 59% between 2015 and 2018. Following the end of Government transfers to GuySuCo in 2019, which led to a sharp decline in budget transfers to the agricultural sector, it rose to 96%.

Despite a strong emphasis on diversification in the Government's strategic policy documents for agriculture, support to the agricultural sector remained highly concentrated on three commodities: poultry, sugar, and rice. The poultry subsector continued to receive most of the MPS (73%), as a result of a high import tariff that protects domestic producers. Support to the poultry subsector, in other words, is financed primarily by transfers from consumers, who end up paying higher prices for agricultural commodities (and for chicken, in particular) as a result of Government policies. Guyana's School Feeding Program, which does create transfers from taxpayers to consumers and has grown significantly since 2015, remained, however, still too small to compensate Guyanese consumers for these higher prices.

The rice and sugar subsectors, on the other hand, were the only ones to receive commodity-specific support through budgetary transfers between 2015 and 2019. Despite capturing over 91% of budgetary transfers, on average, between 2015 and 2018, the sugar subsector remained on a steep downward trend, with both production and exports dropping significantly over that period. The end of Government transfers to GuySuCo in 2019 did not lead to a redistribution of budgetary resources within the agricultural sector. Instead, Guyana's TSE dropped from 3.6% in 2018 (as a share of Guyana's GDP) down to 2.3% in 2019. Rice, on the other hand, remains Guyana's main agricultural product. The rice subsector has received commodity-specific support between 2015 and 2019 through price support as well as budgetary transfers, though at a much lower level than the sugar subsector. In addition, all the activities and services provided by the Guyana Rice Development Board (GRDB) to rice farmers are funded by the subsector itself through a direct levy.

Guyana's percentage GSSE (%GSSE; the GSSE expressed as a share of the TSE) went down from an average of 24% over the period 2010-2014 to 14% in 2015-2019. However, a growing body of evidence suggests that support to general services is not only less distorting than MPS, but also contributes the most to long-term growth and competitiveness in agriculture. A recent regional study, for instance, shows that a shift of 10 percentage points of the agricultural budget from private goods (or transfers to individual producers) to public goods (general services), while keeping total spending constant, leads to an estimated 5% increase in value added per capita. To achieve the same increase would require an increase of approximately 25% or more in total spending, while holding the mix (or the distribution between private and public goods) constant.[50]

DESPITE A STRONG EMPHASIS ON DIVERSIFICATION IN THE GOVERNMENT'S STRATEGIC POLICY DOCUMENTS FOR AGRICULTURE, SUPPORT TO THE AGRICULTURAL SECTOR REMAINS HIGHLY CONCENTRATED ON THREE COMMODITIES: POULTRY, SUGAR, AND RICE

50. Anriquez, G. et al. (2016). *Public Expenditures and the Performance of Latin American and Caribbean Agriculture*. IDB Working Paper Series.

With respect to GHG emissions, policy transfers do not clearly incentivize or disincentivize GHG emissions. The poultry subsector, which receives most of the policy support in Guyana, emits little. Sugar and rice, on the other hand, are the commodities with the highest GHG emissions per hectare. Commodities that emit the least such as tomatoes and coconut, however, receive little to no policy support.

Based on these different observations for the period 2015-2019, the following policy recommendations can be made:

1. **Reduce the poultry and rice subsectors' protection, obtained through trade policy, and at the expense of domestic consumers as well as the subsectors' mid-term to long-term efficiency.** Lower consumer prices would improve food security in the short-term —chicken being the primary source of animal protein in Guyana and rice the main staple food.

2. **Do not cut overall public investments in the agricultural sector.** Convert GuySuCo subsidies into less-distortive forms of support such as GSSE. In the medium- to long-term, investments in R&D, agricultural health and physical infrastructures, for instance, are indeed very much likely to contribute to lower production costs and to improve the agricultural sector's competitiveness, thus contributing to the Government's food security, diversification, emission-reduction and productivity objectives.

3. **Improve the collection and dissemination of agricultural statistics so as to facilitate policy monitoring and analysis.** Tools such as the PSE and the analysis of agricultural policies-related GHG emissions could be updated by the Government, and then used as inputs for more evidence-based policymaking.

THE POULTRY SUBSECTOR, WHICH RECEIVES MOST OF THE POLICY SUPPORT IN GUYANA, EMITS LITTLE. SUGAR AND RICE ARE THE COMMODITIES WITH THE HIGHEST GHG EMISSIONS PER HECTARE. COMMODITIES THAT EMIT THE LEAST SUCH AS TOMATOES AND COCONUT, HOWEVER, RECEIVE LITTLE TO NO POLICY SUPPORT

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ANNEX 1: MAIN INVESTMENT PROJECTS

PROJECT NAME	FUNDING	DESCRIPTION
EAST DEMERARA WATER CONSERVATORY	NATIONAL; JAPAN	The project entails revetment works at Flagstaff-cane grove, procurement of spares, and consultancy work for the improvement of existing drainage and irrigation systems.
FLOOD RISK MANAGEMENT PROJECT	INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA)	The project entails: 1. Rehabilitation of sections of East Demerara Water Conservancy embankment. 2. Hydrology and hydraulic modeling of the East Demerara Water Conservancy. 3. Design and construction of pump station at Liliendaal. 4. Procurement of earth-moving equipment.
REVERSE LINKAGE PROGRAM RICE IMPROVEMENT	ISLAMIC DEVELOPMENT BANK (ISDB)	The project entails: 1. Introduction of Innovative rice varieties from Malaysia including: a) Two high-yielding varieties and one aromatic variety. b) Development of a rice value chain. c) Capacity building in Certified Seed Production and breeding methodology and protocol. 2. Establishment of a unified seed production system. Perceived benefits of the project include enhanced rice production and improved quality, and enhanced rice-based value-added products.
NATIONAL DRAINAGE AND IRRIGATION AUTHORITY	NATIONAL	The project includes the construction, rehabilitation, and construction of drainage and irrigation structures and pump stations for improved infrastructure and increased agricultural production.
MANGROVE MANAGEMENT	NATIONAL	The project includes the construction of Groynes in Richmond, Paradise, and Triumph, provisions for monitoring and data collection, and renovation of the Mangrove Awareness Centre at Victoria, towards the ultimate aim of sustainable coastal zone protection.
MAHAICA/MAHAICONY/ABARY	NATIONAL	The project entails the provision of the sluice at D'Edward, Berbice, for improved production and reduced flooding.

PROJECT NAME	FUNDING	DESCRIPTION
RURAL AGRICULTURE INFRASTRUCTURE DEVELOPMENT	NATIONAL; CARICOM DEVELOPMENT FUND (CDF)	The project entails: 1. Completion of drainage and irrigation systems and access dams at Mocha, Triumph, Buxton, and Ithaca. 2. Commencement of on-farm development at Mocha, Triumph, Buxton, and Ithaca. 3. Provision for dairy farm and processing facility – President's College. 4. Provision of planting materials to selected farming groups in project areas. 5. Purchase of equipment. With the perceived benefit of improved access to agricultural infrastructure and farmlands and increased agricultural productivity.
GUYANA SCHOOL OF AGRICULTURE	NATIONAL	Capital expenditure for maintenance and upgradation of facilities, and equipment.
GUYANA LIVESTOCK DEVELOPMENT AUTHORITY	NATIONAL	Capital expenditure for maintenance and upgradation of facilities, and equipment.
NATIONAL AGRICULTURE RESEARCH AND EXTENSION INSTITUTE	NATIONAL	Capital expenditure for maintenance and upgradation of facilities, and equipment.
HINTERLAND ENVIRONMENTALLY SUSTAINABLE AGRICULTURE DEVELOPMENT PROJECT	NATIONAL; INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT (IFAD)	The project includes provision for: 1. Investment plans for the development of local value chains. 2. Establishment of investment fund for entrepreneurial, agriculture-based ventures In Regions 1 and 9. 3. Conduct of State of Food and Agriculture Study (SOFA) in Mabaruma and Moruca. 4. infrastructure to promote community resilience. 5. Institutional strengthening. With the perceived benefit of: 1. Improved access to financing for farmers. 2. Increased income-generating opportunities. 3. Enhanced food security and nutrition.
NEW GUYANA MARKETING CORPORATION	NATIONAL	Capital expenditure for maintenance and upgradation of facilities, and equipment.
AQUACULTURE DEVELOPMENT	NATIONAL	Projects include procurement of boats, development of incubators, security systems, fish feeders, and water filtration systems for improved production and efficiency.

PROJECT NAME	FUNDING	DESCRIPTION
HYDROMETEOROLOGY	NATIONAL	Includes provisions for upgrade of satellite system and other operational infrastructure for improved data collection and efficiency.
SUSTAINABLE AGRICULTURE DEVELOPMENT PROGRAMME	INTER-AMERICAN DEVELOPMENT BANK	The project includes provision for: 1. Construction of abattoirs at Regions 3 and 5. 2. Support to farmers in Region 4, 5, 6 and 10. 3. Support to Wales Development Authority. 4. Institutional strengthening. With the perceived benefit of: 1. Improved quality data for agricultural sector. 2. Enhanced productivity and ability to meet sanitary and phytosanitary standards. 3. Access to processing facilities.

Source: Ministry of Finance (Budget Estimates)

ANNEXES

ANNEX 2: PSE METHODOLOGY DEFINITIONS*

Producer Support Estimate (PSE): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

Percentage PSE (PSE%): PSE as a share of gross farm receipts.

General Services Support Estimate (GSSE): the annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that create enabling conditions for the primary agricultural sector through development of private or public services, institutions, and infrastructure, regardless of their objectives and impacts on farm production and income, or consumption of farm products. The GSSE does not include transfers to individual producers.

Consumer Support Estimate (CSE): the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products.

Percentage CSE (CSE%): CSE as a share of consumption expenditure (measured at farm gate) net of taxpayer transfers to consumers.

Total Support Estimate (TSE): The annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Percentage TSE (TSE%): TSE as a share of GDP.

Single Commodity Transfers (SCT): The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

(*) OECD's Producer Support Estimate and Related Indicators of Agricultural Support – Concepts, Calculations, Interpretation and Use (The PSE Manual). OECD (March 2016).

Percentage Single Commodity Transfers (SCT%): The commodity SCT as a share of gross farm receipts for the specific commodity.

Reference price: is the price that domestic producers could have received for their products in the absence of any domestic or trade policy affecting the commodity's market. Border prices of imports or exports are often used as reference prices. Another option is to use specific border prices in neighbouring countries or in countries that play a major role in international trade in that commodity, or prices on securities exchanges.

Reference price and producer's price for MPS calculations: must be measured at the same level of processing and at the same market. Therefore, reference prices (border prices) must be adjusted for marketing margins to make them comparable to farm-gate producer prices. The adjustment is made for the cost of processing, handling, and transportation to the market where domestically produced commodity encounters the commodity from the foreign market.

Price adjustment for imported commodity: CIF price + costs of transporting the product from the border to the internal wholesale market (T1) = price of imports at domestic market level – cost of transporting the product from the wholesale market to the farm gate (T2) – costs of processing farm product into imported product (S) = price of imports in farm gate equivalent.

Price adjustment for exported product: FOBprice – handling and transportation costs between border and domestic wholesale market (T1) – handling and transportation costs between wholesale market and the farm gate (T2) – costs of processing of farm product into exported product (S) = price of exports adjusted to the farm gate level.

Budget Transfers (BTs): for calculating coefficients of support estimation can exist in the form of transfers to producers, financing of general services, or transfers to consumers. Thus, all budget transfers need to distinguish between PSE, CSE, and GSSE.

PSE categories indicate the way the policy program is implemented by indicating the base on which the transfer or subsidy is calculated, such as value of production, number of animals, input use, services provided, income, or non-commodity criteria **(Table 12).**

Budget transfers to fund general services have been separated from PSE and have instead been calculated as a separate indicator since 1998: **General Services Support Estimate (GSSE) (Table 13)**. In 2014, the OECD changed its methodology for estimating GSSE.

TABLE A: CLASSIFICATION OF BUDGET TRANSFERS IN PSE, ACCORDING TO OECD METHODOLOGY

CATEGORIES
A. SUPPORT BASED ON COMMODITY OUTPUTS
A.1. MARKET PRICE SUPPORT
A.2. PAYMENTS BASED ON OUTPUT
B. PAYMENTS BASED ON INPUT USE
B.1. VARIABLE INPUT USE
B.2. FIXED CAPITAL FORMATION
B.3. ON-FARM SERVICES
C. PAYMENTS BASED ON CURRENT A (AREA) / AN (ANIMAL NUMBER) / R (RECEIPTS) / I (INCOME), PRODUCTION REQUIRED
C.1. BASED ON CURRENT RECEIPTS/INCOME
C.2. BASED ON CURRENT AREA/ANIMAL NUMBER
D. PAYMENTS BASED ON NON-CURRENT A/AN/R/I, PRODUCTION REQUIRED
E. PAYMENTS BASED ON NON-CURRENT A/AN/R/I, PRODUCTION NOT REQUIRED
E.1. VARIABLE RATES (VARY WITH RESPECT TO LEVELS OF CURRENT OUTPUT OR INPUT PRICES, OR PRODUCTION/YIELDS AND/OR AREA)
E.2. FIXED RATES
F. PAYMENTS BASED ON NON-COMMODITY CRITERIA
F.1. LONG-TERM RESOURCE RETIREMENT
F.2. SPECIFIC NON-COMMODITY OUTPUT
F.3. OTHER NON-COMMODITY CRITERIA
G. MISCELLANEOUS PAYMENTS

Source: OECD, 2016.

TABLE B: CLASSIFICATION OF GSSE BUDGET TRANSFERS, ACCORDING TO OECD METHODOLOGY

GENERAL SERVICES SUPPORT ESTIMATE (GSSE)
H. AGRICULTURAL KNOWLEDGE AND INNOVATION SYSTEM
H.1. AGRICULTURAL KNOWLEDGE GENERATION
H.2. AGRICULTURAL KNOWLEDGE TRANSFER
I. INSPECTION AND CONTROL
I.1. AGRICULTURAL PRODUCT SAFETY AND INSPECTION
I.2. PEST AND DISEASE INSPECTION AND CONTROL
I.3. INPUT CONTROL
J. DEVELOPMENT AND MAINTENANCE OF INFRASTRUCTURE
J.1. HYDROLOGICAL INFRASTRUCTURE
J.2. STORAGE, MARKETING, AND OTHER PHYSICAL INFRASTRUCTURE
J.3. INSTITUTIONAL INFRASTRUCTURE
J.4. FARM RESTRUCTURING
K. MARKETING AND PROMOTION
K.1. COLLECTIVE SCHEMES FOR PROCESSING AND MARKETING
K.2. PROMOTION OF AGRICULTURAL PRODUCTS
L. COST OF PUBLIC STOCKHOLDING
M. MISCELLANEOUS

Source: OECD, 2016.

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