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AGRICULTURAL POLICIES IN LATIN AMERICA AND THE CARIBBEAN 2023

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AGRICULTURAL POLICIES IN LATIN AMERICA AND THE CARIBBEAN 2023

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EXECUTIVE SUMMARY

Since 2014, the Inter-American Development Bank (IDB), through the Agrimonitor initiative, has systematically analyzed the agricultural public policies of the region's countries, following the Producer Support Estimate methodology developed by the Organization for Economic Cooperation and Development (OECD). This methodology allows for international comparisons of the different types and levels of support provided to the sector.

This document is the third installment in a series of studies on Latin America and the Caribbean (LAC) under the Agrimonitor initiative. It covers a period that extends approximately from 2009 to 2021 and analyzes the differences between the agricultural sectors of the countries in the region, from both a performance perspective and the public policies that have supported them. It also aims to identify common patterns among the countries that could help outline potential future paths for their agricultural sectors.

In recent years, the sector has faced turbulent times due to the COVID-19 pandemic, the conflict between Russia and Ukraine, and a series of natural phenomena that have affected several LAC countries. Although, in most cases, food supply chains continued operating, the health restrictions imposed during the pandemic heavily impacted the hotels and restaurant sectors in some countries. The decline in economic activity resulting from the pandemic affected the income of many families, leading them to shift their consumption patterns to substitute more expensive foods (such as beef) with cheaper alternatives. At the same time, the conflict between Russia and Ukraine, which began in February 2022, has impacted international agricultural markets due to the importance of these countries in exporting fertilizers, corn, wheat, barley, sunflower, and related products.

As a result of all these events, food prices increased significantly during 2020 and 2021, reaching historic highs by May 2022. Additionally, since 2016, some Southern Cone countries have faced severe droughts. The 2022/2023 agricultural season in Argentina, for instance, was the worst in the last 60 years. This situation is compounded by phenomena such as locust plagues in Argentina and Bolivia,

wildfires in Chile, and tropical storms in Central America. Consequently, between 2019 and 2021, the region's agricultural production growth rate decreased significantly, and the volume of agricultural exports contracted while imports accelerated.

There is a high degree of heterogeneity among the agricultural sectors of the region's countries. Brazil, Argentina, and Mexico account for approximately three-quarters of agricultural production and exports. However, when analyzing various economic performance indicators, it possible to observe that these three countries are not necessarily the ones with the highest relative penetration in high-value markets or the most dynamic in terms of agricultural production and productivity growth: some smaller countries stand out in different indicators. At the same time, there is a group of countries whose agricultural sector is relatively small (making them net importers), less dynamic, and with low (or even declining) productivity growth.

In terms of support for their agricultural sectors, LAC countries provide low levels of support compared to Canada, the United States, and European Union (EU) countries. Only a few, typically smaller countries with less dynamic agricultural sectors, provide levels of support similar to or higher than those outside the region. Most LAC countries provide agricultural support mainly through market price distortions. In contrast, agricultural budgetary spending tends to represent a small fraction of the support given to the sector. This includes investments in public services (infrastructure projects and the operation of agricultural research and development institutions, as well as animal and plant health services), which have proven to be an efficient and effective way to increase per capita agricultural income and reduce poverty. Moreover, all LAC countries, except Argentina, provide a negative level of consumer support; that is, consumers transfer resources to agricultural producers through artificially high prices.

When reviewing trends in sector support over time, a divergent pattern is observed: in general terms, countries that provide relatively less support tend to reduce it, while those that provide relatively more support tend to increase it. The division between these two groups largely coincides with performance distinctions: on one hand, countries with a relatively more dynamic and productive agricultural sector that provide low levels of support; on the other hand, countries with a smaller, net-importing, relatively less dynamic and productive sector that provide increasing levels of support. Beyond this, in terms of objectives, policies aimed at increasing the sector’s productivity, income, and competitiveness predominate. However, in some countries, there is an emphasis on supporting family or small-scale producers or on implementing programs to ensure food security for the population. There is also a growing interest in promoting the environmental sustainability of the sector.

On this last point, Agrimonitor data allows for an analysis of the relationship between support provided to specific production sectors and their greenhouse gas (GHG) emissions. The conclusion is that there does not seem to be a bias in agricultural policy either in favor of or against sectors with higher or lower levels of GHG emissions. In other words, the policy seems to be carbon-neutral. It is worth noting that the available data covers only some sectors in some countries, so the analysis cannot be generalized for the entire region. Moreover, the regional result corresponds to the aggregate of all included countries and not to the individual level: in some countries, the policy favors sectors with lower levels of GHG emissions, while in others, the opposite happens.

The Agrimonitor database also allows for an analysis of support to the fisheries and aquaculture sectors in 13 countries in LAC. Like agriculture, aquaculture and fisheries production is highly concentrated. In this case, almost three-quarters of marine catches are made by Peru, Chile, and Mexico, and 78% of aquaculture production comes from Chile, Ecuador, and Brazil. In this case, there is also high heterogeneity within LAC in terms of aquaculture and fisheries performance and the levels of support provided to the sector, either as a proportion of value or production volume. Honduras, Suriname, Costa Rica, and, to a lesser extent, Brazil provide much higher levels of support per production volume than the rest of the analyzed countries. On the other hand, Chile, Peru, Ecuador, and Mexico have much lower levels of support. It is also notable that Peru, Chile, and Ecuador, three of the leading countries in production (Ecuador in the case of aquaculture), invest at least half of their sector support resources in the provision of general services.

One last issue addressed in this report is food security and its relationship with agricultural policies. This has been particularly important during the period under analysis due to the marked increase in food prices and the setbacks the region has faced in terms of food security. The data suggests that this deterioration has been due to a problem of economic access to food by the population, rather than a lack of availability. In this scenario, combating the negative effects of rising prices becomes a public policy priority, potentially including agricultural policy. To verify this, the relationship between food price increases and changes in consumer support estimates is analyzed. Although few countries have recent data on food product inflation, there are indications of a possible positive relationship between greater price increases and higher levels of consumer support. While the direction of causality is unclear, there are slight indications that countries facing a greater price increase may have implemented policies to reduce producer support via market prices (with a consequent increase in consumer support) to mitigate the adverse effects on food security.

Support and reforms to the sector should aim to include approaches and practices with lower environmental impact, such as agroecology, permaculture, and climate-smart agriculture, among others. In this way, an integrated approach to soil and landscape management could be adopted to increase productivity, improve resilience, reduce emissions, and simultaneously achieve agricultural development and better food security.


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GLOSSARY OF ACRONYMS, INITIALISMS, AND SYMBOLS

LAC | Latin America and the Caribbean

MPS | Market Price Support

IDB | Inter-American Development Bank

CO_2eq | Carbon Dioxide Equivalent

CSE | Consumer Support Estimate

PSE | Producer Support Estimate

FSE | Fisheries Support Estimate

GSSE | General Services Support Estimate

TSE | Total Support Estimate

FAO | Food and Agriculture Organization of the United Nations

GHG | Greenhouse Gases

TBSE | Total Budgetary Support Estimate

OECD | Organization for Economic Cooperation and Development

CO | Support Based on Commodity Outputs

PO | Payments Based on Output

OBP | Other Budgetary Payments

BPP | Budgetary Payment to Producers

GDP | Gross Domestic Product

PRODUCE | Ministry of Production of Peru

TFP | Total Factor Productivity

pp | Percentage Points

TCT | Transfers to Consumers from Taxpayers

PSCT | Producer Single Commodity Transfers

EU | European Union

US$ | United States Dollars

VAP | Value Added of Production

1. INTRODUCTION

Latin America and the Caribbean (LAC) is, as a whole, an agricultural powerhouse. However, while this statement is generally true, it does not reflect the significant differences that exist between the agricultural sectors of the countries in the region or the several challenges they face. These differences are shaped by a series of agroecological, historical, social, and economic factors, including the public policies implemented to support and develop the sector.

Since 2014, the Inter-American Development Bank (IDB), through the **Agrimonitor initiative**[1], has systematically analyzed the agricultural public policies of the countries in the region, following the Producer Support Estimate (PSE) methodology developed by the Organization for Economic Cooperation and Development (OECD). This methodology allows for international comparisons of the different types and levels of support provided to the sector. Since 2017, the Josling (2017) methodology has also been incorporated to analyze the relationship between agricultural public policies and greenhouse gas (GHG) emissions. Additionally, the OECD's Fishery Support Estimate (FSE) methodology has been applied to study support for the fisheries sector.

The various analyses of agricultural and fisheries policies from the Agrimonitor initiative have generated a comprehensive database and a series of publications focused on the LAC countries, analyzing their agricultural and fisheries policies. This document is the third installment of this series. It provides an updated regional analysis of the agricultural sector and recent changes in the public policies that support it, covering the period from approximately 2009 to 2021. The first installment (Gurria et al., 2016) included information up to 2014, and the second (Egas Yerovi and De Salvo, 2018)

SINCE 2014, THE INTER-AMERICAN DEVELOPMENT BANK (IDB), THROUGH THE AGRIMONITOR INITIATIVE, HAS BEEN SYSTEMATICALLY ANALYZING AGRICULTURAL PUBLIC POLICIES IN THE COUNTRIES OF THE REGION, FOLLOWING THE METHODOLOGY OF THE PRODUCER SUPPORT ESTIMATE INDICATOR DEVELOPED BY THE OECD

1. See agrimonitor.iadb.org

up to 2016. Beyond presenting the most up-to-date analysis possible, this work aims to highlight the differences among the agricultural sectors of the countries in the region, both in terms of their performance and the sectoral public policies implemented by their governments. It also aims to identify common patterns among the countries.

The document is divided into eight sections, including this introduction. Section 2 provides an overview of the recent context in which the agricultural sector has developed in LAC, highlighting the main exogenous events it has faced, as well as the evolution of some important performance indicators. The next section uses the Agrimonitor database to present the current state of the support levels received by the sector. Section 4 analyzes the trends in regional agricultural policy: it focuses on the changes over time in the various types of support and includes a brief overview of recent changes in policy objectives. The following three sections address more specific topics: the GHG emissions of the agricultural sector and their relationship with support policies (section 5), trends in support for the fisheries and aquaculture sector (section 6), and reflections on sector support and food security in the region (section 7). Finally, section 8 presents the conclusions.

1.1. TECHNICAL SPECIFICATIONS

First, LAC refers to the 26 borrowing member countries of the IDB: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

Second, the estimates of support for the sector contained in the Agrimonitor database are divided into two: those corresponding to the agricultural sector, and those corresponding to the fishing and aquaculture (sub)sector. Both groups of estimates are independent; however, there may be overlap, especially concerning support provided through the provision of general services for the agricultural sector, whose estimates may include benefits for fishing and aquaculture.

Regarding the data used in this work, the primary source is the Agrimonitor database, which contains information for 25 LAC countries (the 26 mentioned earlier, except Venezuela), plus the United States, Canada, and the European Union (EU), but with different periods and topics[2]. The Agrimonitor database contains estimates of support for the agricultural and fishing-aquaculture sectors. In the first case, they follow a methodology defined by the OECD in 1987, which measures year by year since 1986 the support received by the agricultural sector in OECD countries and others: "OECD indicators were developed to monitor and evaluate changes in agricultural policy, establish a common basis for policy dialogue among countries, and provide economic data to assess the effectiveness and efficiency of policies" (OECD 2016, 15).

On the other hand, the OECD's estimates of support for the fishing and aquaculture sector follow a similar methodology and objective as mentioned before (see OECD 2015, 6). This database contains information since 2000, although most countries only have data starting from 2007. Within LAC, the OECD makes estimates only for Argentina, Brazil, Chile, Colombia, Costa Rica, and Mexico. The Agrimonitor initiative includes the other borrowing member countries of the IDB. In addition to the Agrimonitor database, this work uses the FAOSTAT and FISHSTAT databases from the Food and Agriculture Organization of the United Nations (FAO).

THIS WORK AIMS TO HIGHLIGHT THE DIFFERENCES AMONG THE AGRICULTURAL SECTORS OF THE COUNTRIES IN THE REGION, BOTH IN TERMS OF THEIR PERFORMANCE AND THE SECTORAL PUBLIC POLICIES IMPLEMENTED BY THEIR GOVERNMENTS

2. This detail is shown in Annex 1, Table 11.

2. ECONOMIC AND AGRICULTURAL DEVELOPMENT IN LAC

2.1. REGIONAL OVERVIEW

Agriculture is a key economic sector in LAC. In 2022, it contributed almost 7% of the region's total gross domestic product (GDP). Although this percentage has remained practically unchanged since 2019, it is higher than the average of the last 10 years (5%). However, this contribution varies between countries. For instance, while agriculture contributes less than 4% to GDP in countries like Mexico and Chile, it accounts for more than 15% in Belize and Nicaragua and approximately 20% in Paraguay. When upstream and downstream activities related to primary production are included, the sector represents more than 20% of GDP in most LAC economies. Additionally, agriculture provides 15% of total employment in the region —a figure that has remained stable over the past decade—[3] and accounts for 15% of global agricultural exports.

3. According to data from the World Development Indicators (WDI), by the World Bank.

18% of LAC's population (121 million people) live in rural areas. This proportion varies widely between countries: in Uruguay, it is around 5% of the total population, in Bolivia 30%, in Ecuador 36%, and in Paraguay 38% (Gáfaro et al. 2023). In 2022, approximately 49% of the rural population lived in poverty (Stampini and Bosch 2022). Furthermore, the rural poverty rate in LAC is more than double that of urban poverty (Gaudin and Pareyón Noguez 2020, FAO 2022, CEPAL 2023).

During the period from 2017 to 2022, agricultural growth in LAC slowed compared to previous periods. Between 1961 and 2000, it grew at an average annual rate of 2.5%, slightly outpacing the global rate of 2.3%. Between 2000 and 2011[4], growth accelerated to 3.4% in LAC, compared to 2.5% globally. However, in recent years, this gap closed, and in some cases global growth surpassed that of LAC, in a context of general economic slowdown **(Table 1).**

TABLE 1. GROWTH OF GROSS AGRICULTURAL PRODUCTION

PERIOD	WORLD	LAC
1961 TO 2000	2.3%	2.5%
2000 TO 2011	2.5%	3.4%
2011 TO 2017	2.1%	2.3%
2017 TO 2021	1.4%	1.3%

Note: The growth rates were calculated based on the FAO Gross Production Index (base 2014-2016). In the case of LAC, this index for each country was weighted by the value of gross production measured in international dollars for the 2014-2016 period.

Source: Own elaboration based on FAOSTAT data.

A similar trend was observed with agricultural exports. In real terms, LAC's agricultural exports had been growing faster than global agricultural exports, but between 2017 and 2021, the region's exports grew at a significantly lower rate than the global average. The nominal value of LAC's exports grew at the same rate as the global average during this period **(Table 2).**

4. For this analysis, 2011 is taken as the cutoff year not only because it is approximately the midpoint of the time elapsed in the current century, but also because it marks the end of the first period of rising prices for various commodities so far this century (see Figure 2, and Nin-Pratt and Valdés Conroy 2020).

TABLE 2. GROWTH OF AGRICULTURAL EXPORTS

	NOMINAL VALUE		QUANTITY INDEX	
PERIOD	WORLD	LAC	WORLD	LAC
1961 TO 2000	6.8%	6.5%	3.9%	5.6%
2000 TO 2011	11.2%	13.9%	3.9%	6.8%
2011 TO 2017	1.4%	0.7%	4.9%	5.4%
2017 TO 2021	5.6%	5.6%	1.6%	1.1%

Note: The growth rates were calculated based on the quantity index of exports published by FAOSTAT for the world and the average of this index for each country in LAC weighted by the export value base quantity.

Source: Own elaboration based on FAOSTAT data.

With agricultural imports, however, the opposite has occurred. From 2000 to 2017, those from LAC grew at a lower rate than the global ones (both in nominal and real terms), and from 2017 to 2021, they grew at a faster rate than the global ones (Table 3).

TABLE 3. GROWTH OF AGRICULTURAL IMPORTS

	NOMINAL VALUE		QUANTITY INDEX	
PERIOD	WORLD	LAC	WORLD	LAC
1961 TO 2000	6.7%	8.4%	3.7%	6.9%
2000 TO 2011	11.0%	10.5%	4.0%	2.6%
2011 TO 2017	1.2%	0.4%	4.6%	3.6%
2017 TO 2021	6.0%	6.7%	2.2%	2.6%

Note: The growth rates were calculated based on the quantity index of imports published by FAOSTAT for the world and the average of this index for each country in LAC weighted by the import value base quantity.

Source: Own elaboration based on FAOSTAT data.

In summary, **during the 2017-2021 period, the decline in the growth rate of Agricultural production in the region was accompanied by a smaller increase in exports and a rise in imports** (Figure 1). The COVID-19 crisis is one of the explanations for these changes. Although the Agricultural sector was much less affected than others —in 2020, it grew by 0.46%, while the region's GDP fell by almost 7% (OECD/FAO 2021 and WDI data)— the pandemic caused several adverse effects: (i) disruptions in supply chains due to limited labor mobility, (ii) changes in diets due to rising food costs (which led to a greater preference for basic food goods), (iii) drops in income and demand for goods, and (iv) increases in the number of people (estimated at nearly 20 million) who could not access a healthy diet (Diaz-Bonilla et al. 2022).

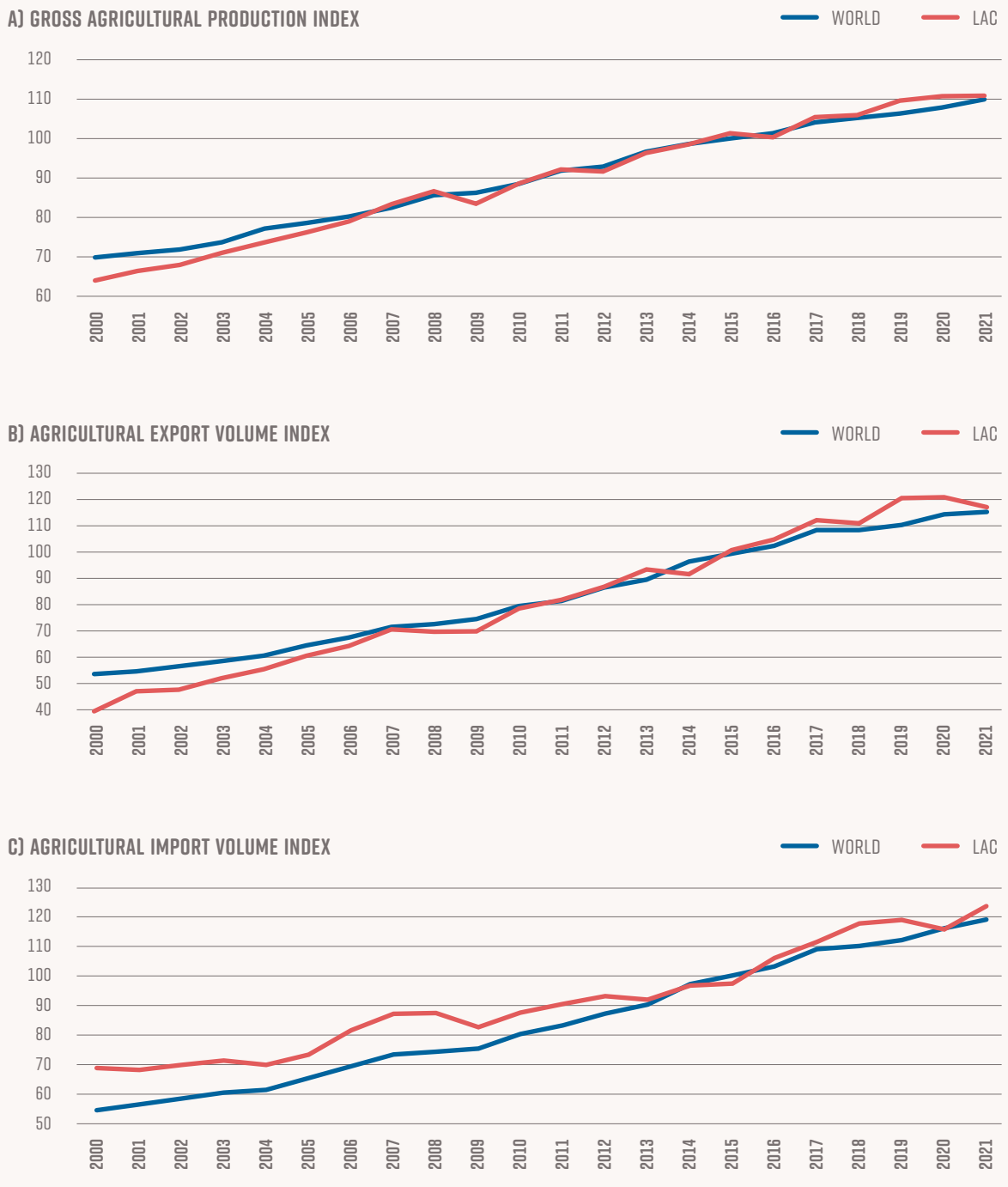
Agricultural commodity prices faced upward pressure during the COVID-19 crisis and the war between Russia and Ukraine. Some countries in the region responded by eliminating or temporarily reducing restrictions on agri-food imports. For instance, in October 2020, the Brazilian government suspended import tariffs on rice, corn, soybeans, and soybean oil from countries in the Southern Common Market (MERCOSUR) (USDA-FAS 2020a). In response to continued inflationary pressures, in November 2021, it unilaterally applied a 10% reduction in import tariffs for 87% of all goods and products, including a large number of agri-food products. In May 2022, it eliminated import tariffs on beef, chicken, corn, wheat flour, and bakery products for the rest of the year (USDA-FAS 2022b).

In March 2020, the Salvadoran government temporarily eliminated import tariffs and set maximum sales prices for several basic food products (USDA-FAS 2020b). Two years later, it enacted a temporary law to Combat Price Inflation of Basic Products, which reduced import tariffs on a wide variety of agricultural and food products and inputs, and streamlined import procedures for one year (USDA-FAS 2022c). In Nicaragua, the government expanded the duty-free quota for imported chicken in 2022 (USDA-FAS 2022d).

THE PRICES OF BASIC AGRICULTURAL COMMODITIES FACED UPWARD PRESSURE DURING THE COVID-19 CRISIS AND THE WAR BETWEEN RUSSIA AND UKRAINE. SOME COUNTRIES IN THE REGION RESPONDED BY ELIMINATING OR TEMPORARILY REDUCING RESTRICTIONS ON THE IMPORTATION OF AGRI-FOOD PRODUCTS

FIGURE 1. EVOLUTION OF AGRICULTURAL PRODUCTION, EXPORTS, AND IMPORTS INDICES

(BASE 2014-2016)



Note: For the world, the indices have been taken directly from FAOSTAT. For LAC, an average of these indices was constructed, weighted by the value of gross production (in constant international dollars for 2014-2016, for panel a), the export value base quantity (panel b), and the import value base quantity (panel c).

Source: Own elaboration based on FAOSTAT data.

As the health crisis was resolved, the recovery of economic activity and trade did not result in a decline in prices; instead, prices remained high and even continued to rise until April-May 2022 **(Figure 2).** During 2023, the FAO food price index recorded a year-on-year drop of 13.7%. Indeed, although most of the Figures presented in this report do not cover the year 2022, it can be stated that the conflict between Russia and Ukraine —which began in February of that year— has had repercussions in international agricultural markets due to the prominent role of these countries in the exports of certain products, mainly fertilizers, corn, wheat, barley, sunflower, and its derivatives **(Table 4).**

FIGURE 2. EVOLUTION OF INTERNATIONAL PRICES OF MAJOR AGRICULTURAL PRODUCTS

(IN DOLLARS PER TON)

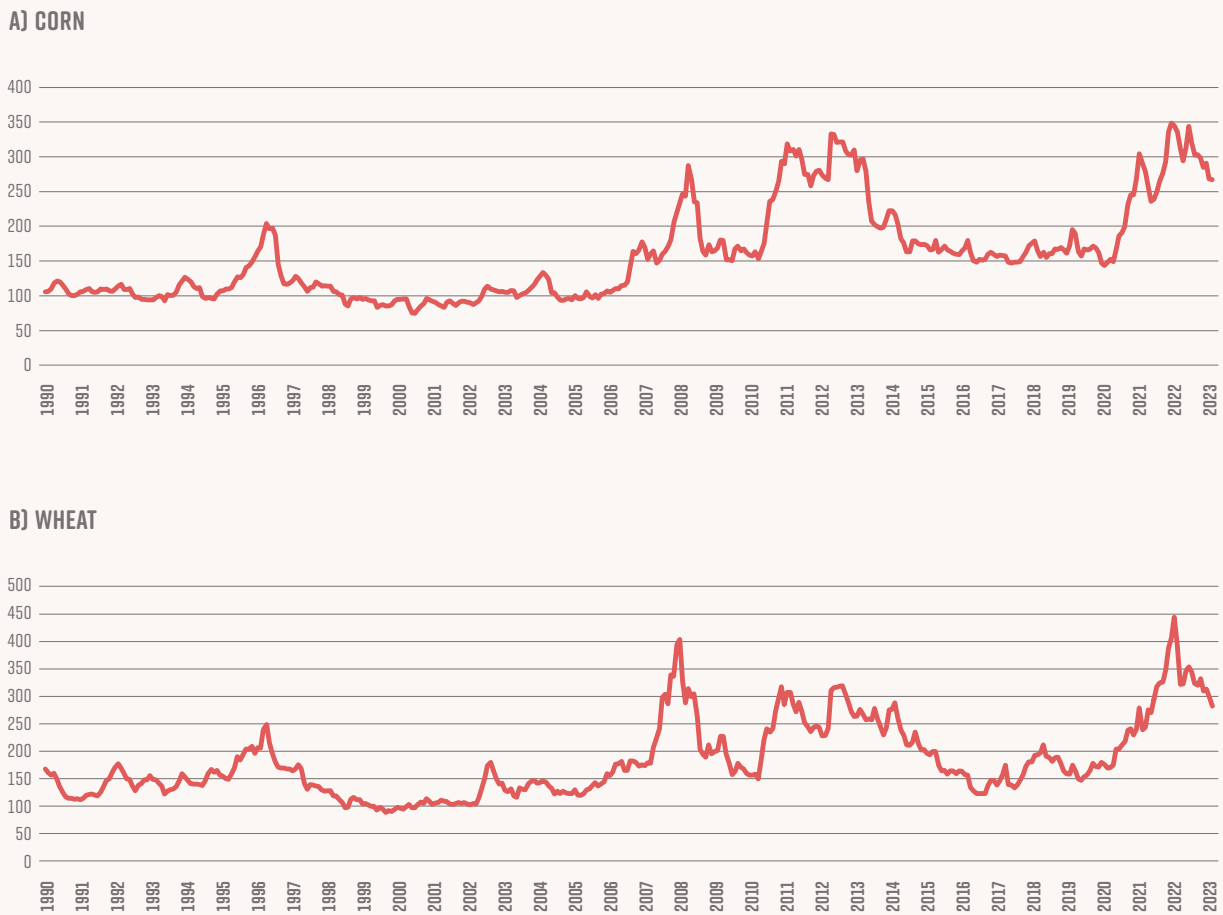


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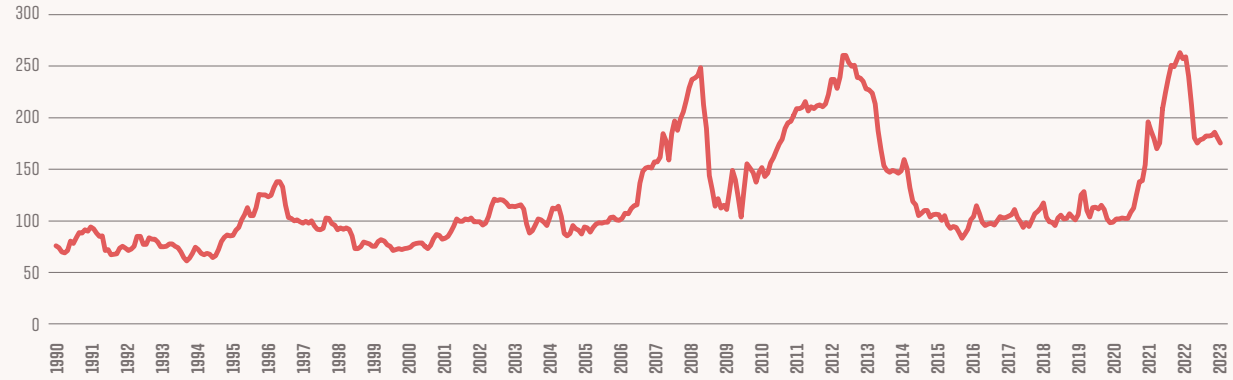
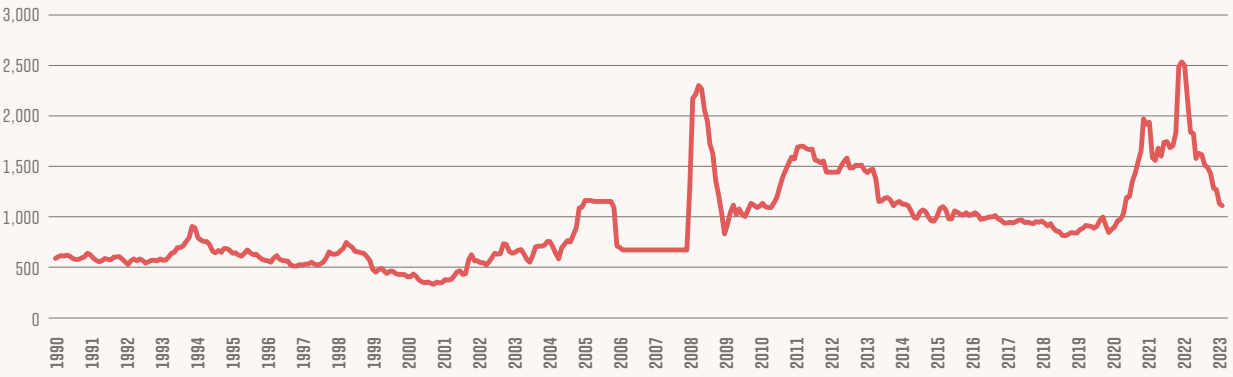
FIGURE 2. EVOLUTION OF INTERNATIONAL PRICES OF MAJOR AGRICULTURAL PRODUCTS

(IN DOLLARS PER TON)

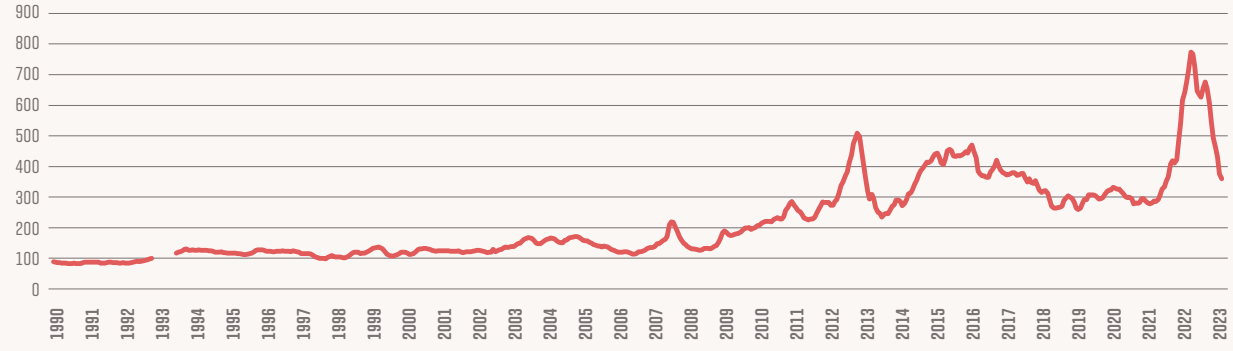
C) BARLEY



D) SUNFLOWER



E) NITROGEN FERTILIZERS



Note: closing prices, monthly average.

Source: own elaboration with data from the Federal Reserve Bank of San Luis (fred.stlouisfed.org).

TABLE 4. PARTICIPATION OF RUSSIA AND UKRAINE IN GLOBAL AGRICULTURAL PRODUCT EXPORTS

(BY VOLUME, AVERAGE 2017-2021)	RUSSIA	UKRAINE
CORN	2%	14%
WHEAT	18%	9%
BARLEY	12%	12%
SUNFLOWER SEEDS	8%	2%
SUNFLOWER OIL	19%	43%
AMMONIUM NITRATE (AN)	44%	0%
ANHYDROUS AMMONIA	23%	1%
NPK FERTILIZERS	30%	0%
MONOAMMONIUM PHOSPHATE (MAP)	20%	0%
UREA	14%	2%
UREA AND AMMONIUM NITRATE SOLUTION	26%	0%
POTASSIUM CHLORIDE	22%	0%

Source: own elaboration based on data from FAOSTAT.

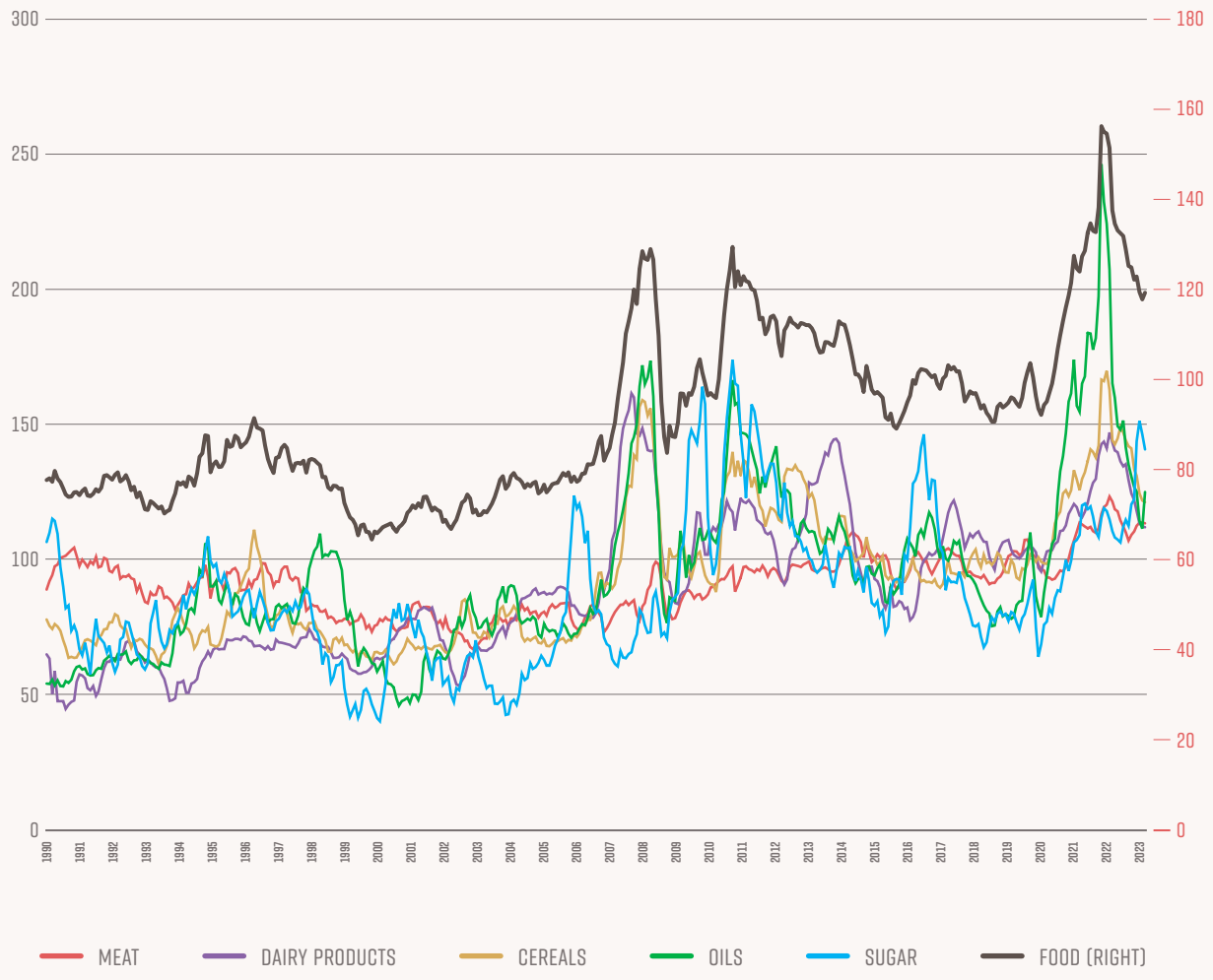
Brazil is the world's largest importer of fertilizers: it imports more than 80% of the fertilizer it needs, and a significant portion of these purchases come from Russia. Thus, in 2022, it established diplomatic agreements with Russia and Iran to ensure the flow of this product into the country and maintain agricultural production. Additionally, it developed a National Fertilizer Plan, with which the dependency on imports of nitrogen-, phosphorus-, and potassium-based fertilizers could be reduced by 60% by 2050 (USDA-FAS 2022a).

The war between Russia and Ukraine has not only reduced agricultural production in the latter country but has also generated uncertainty about its ability to export part of its production to other countries. The signing and implementation of the so-called Grain Deal (Black Sea Grain Initiative)[5] in July 2022 helped reduce this uncertainty, allowing the flow of Russian and Ukrainian grain exports through the Black Sea. Even so, the prices of some agricultural products saw significant increases, adding to those

5. See un.org/en/black-sea-grain-initiative

experienced as a result of the COVID-19 crisis, reaching historic highs in May 2022. The international price of corn, for example, rose by 111% between May 2020 and May 2021, and an additional 13% in May 2022 (with a 19% increase between February and April of this year, following the start of the conflict; **see Figure 2).** Other important products, such as beef and sugar, also experienced significant price hikes (though only sugar has not surpassed its historical peak, reached in 2011). In aggregate terms, therefore, food prices have faced a greater increase than even in 2008, as reflected in the FAO index presented in **Figure 3.**

FIGURE 3. FOOD PRICE INDEX



Source: own elaboration based on FAO Food Price Index (fao.org/worldfoodsituation/foodpricesindex).

In addition to the COVID-19 pandemic and the war between Russia and Ukraine, in recent years, the agricultural sector in Latin America and the Caribbean (LAC) has been affected by a series of natural events. In Bolivia, a severe drought impacted the winter harvest (June-August) of 2016, leading to the loss of 111,000 hectares and 726,000 tons of grain, estimated at US$200 million (a 27% drop compared to the 2015 winter harvest). Furthermore, between January and November 2016, 20,000 head of cattle were lost (USDA-FAS, 2016). The Southern Cone, east of the Andes, has also faced severe droughts almost continuously since 2017. In Argentina, the 2017/2018 season was affected, resulting in significant economic impacts that contributed to the country's macroeconomic instability. Moreover, since 2019, La Niña phenomenon has been causing a series of droughts in every season. Among them, the 2022/2023 season is considered the worst in 60 years, with losses in the country estimated between US$15 billion (according to estimates from the Rosario Board of Trade)[6] and US$20 billion (according to the Córdoba Grain Exchange)[7]. Paraguay (UNDP, 2022) and Uruguay[8] have also been severely affected since 2018. In Paraguay, losses from the 2019/2021 season are estimated at 23% of gross agricultural value added (World Bank, 2022). In Uruguay, as in Argentina, the 2022/2023 season was the most affected, to the extent that the agricultural GDP for the second quarter of 2023 fell by 27.4% compared to the same period in 2022.[9]

In addition, in 2016, Argentina suffered a severe locust plague that affected 700,000 hectares of agricultural land. A few months later, the swarm moved north and devastated about 1,500 hectares in Santa Cruz, Bolivia (USDA-FAS, 2017a). In January 2017, Chile faced unprecedented wildfires. A total of 467,537 hectares of forest and over 32,700 hectares of agricultural land (olive groves and vineyards) burned, and 4,696 producers suffered losses amounting to US$20 million (USDA-FAS, 2017b). Six years later, in February 2023, another series of wildfires consumed 441,316 hectares, including 3,746 hectares of agricultural land, affecting nearly 7,000 producers (USDA-FAS, 2023).

IN ADDITION TO THE COVID-19 PANDEMIC AND THE WAR BETWEEN RUSSIA AND UKRAINE, IN RECENT YEARS THE AGRICULTURAL SECTOR OF LAC HAS BEEN AFFECTED BY A SERIES OF EXTREME WEATHER EVENTS

6. See the articles published in *El País* (bit.ly/4c7nnQN) and the Rosario Stock Exchange portal (bit.ly/3wYSWgK).

7. And the report from the Córdoba Stock Exchange, available at this link: https://drive.google.com/file/d/1x2dJbb-ib3uOLrraFETZiAdq_sPzgzYo/view

8. For this case, refer to the article from *El Observador* at the following link: bit.ly/4e54Vdi

9. See the article from *Agrolatam* at the following link: bit.ly/4e3lg2b

Another natural phenomenon with a strong negative impact on the agricultural sector was storms. In November 2020, with just a two-week interval, tropical storms Eta and Iota hit Central America, particularly affecting Guatemala, Honduras, and Nicaragua. In Guatemala, the agricultural sector faced losses of around US$127 million (1.67% of agricultural GDP).[10] In Honduras, the Central Bank estimated at the end of 2020 that the combined impact of COVID-19 and both storms would result in a cumulative reduction of 5.9% in agricultural GDP (BCH, 2020).

2.2. DIFFERENCES BETWEEN COUNTRIES

Beyond the regional overview, it is important to recognize and analyze the differences between the countries in LAC. This helps not only to identify which countries contribute to regional statistics (and to what extent) but also to better understand what is happening within the sector: **what are the characteristics and trends, how do international events impact each country, and how do the various agricultural policies implemented affect the sector's performance.**

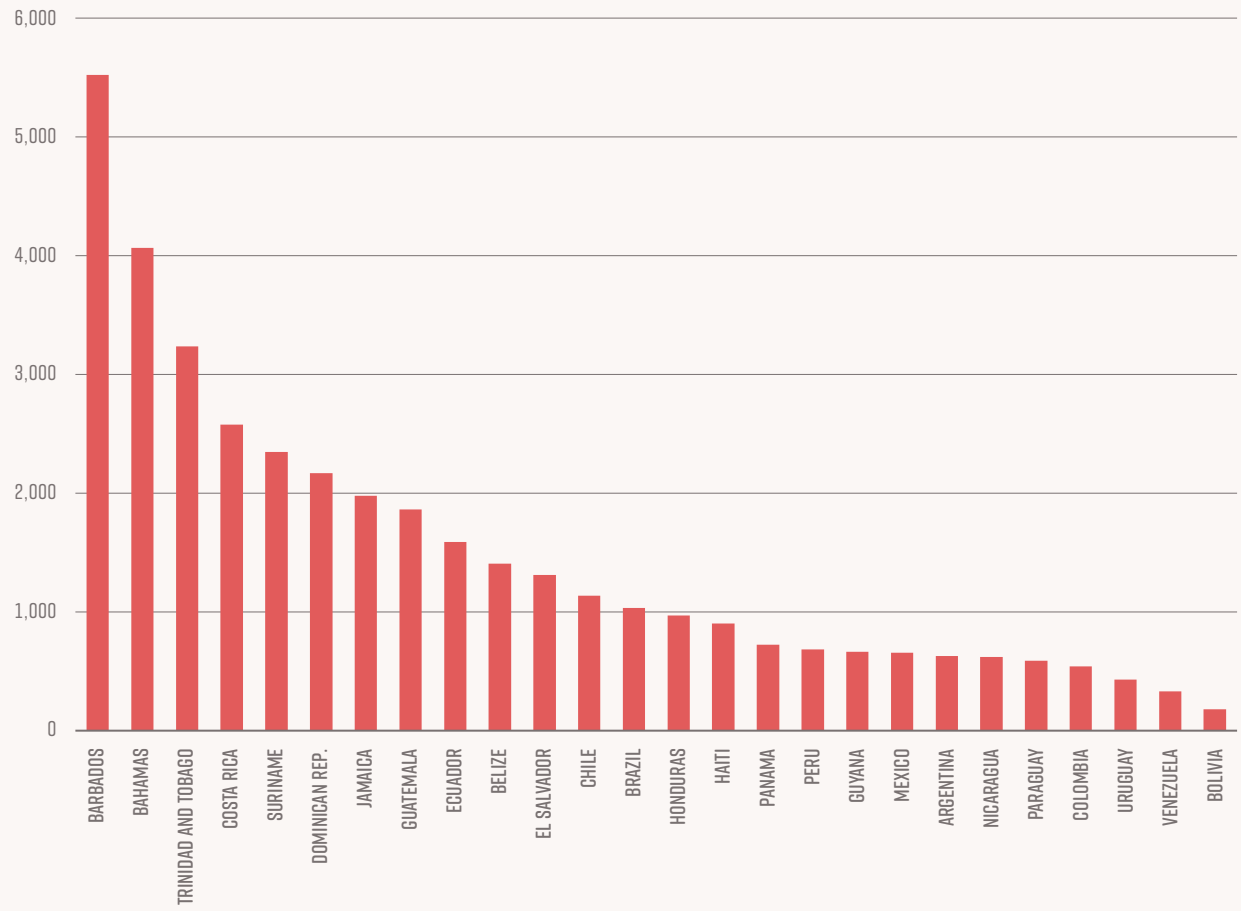
76% of the gross value of agricultural production is concentrated in three countries: Brazil (48%), Argentina (15%), and Mexico (13%).[11] This is partly because these are the largest countries in the region, together accounting for 69% of the agricultural land (Brazil, 36%; Argentina, 18%; Mexico, 15%). Another important reason is their productivity and the relative concentration of high or low-value products in their production basket. From the previous data, it can be deduced that Brazil has a higher income per hectare than Argentina and Mexico; however, this income is lower than in many other countries in the region **(see Figure 4)**. According to FAOSTAT data, smaller countries in the region tend to have the highest income per hectare, which could indicate a concentration in high-value products. However, this does not necessarily mean they are more profitable, as they may require higher production costs or more intensive use of inputs and labor.

10. The estimate of the losses, in quetzales, comes from Bello and Peralta (2021). The Figure was converted to U.S. dollars using an exchange rate of 7.8 quetzales per dollar; the percentage of agricultural GDP was estimated based on the 2020 value, in quetzales, using the World Development Indicators (WDI) from the World Bank.

11. The percentages were calculated based on the value of gross production measured in international dollars from 2014-2016. The Figures represent the average percentages for the years 2017 to 2021.

FIGURE 4. GROSS VALUE OF AGRICULTURAL PRODUCTION PER HECTARE OF AGRICULTURAL LAND

(IN 2014-2016 INTERNATIONAL DOLLARS, AVERAGE 2017-2021)



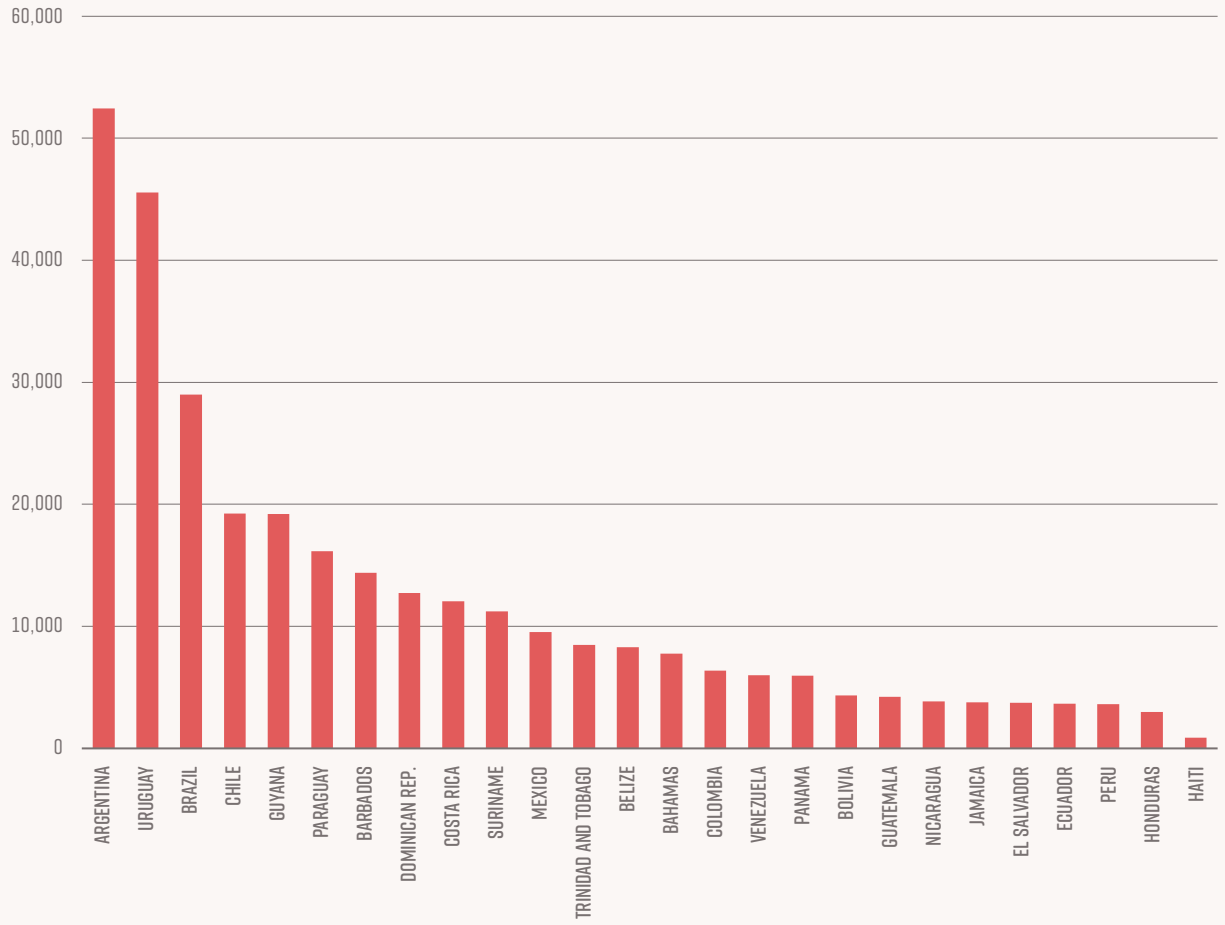
Source: own elaboration based on data from FAOSTAT.

The agricultural production per person employed in the sector provides a measure of labor productivity. It is also observed significant heterogeneity within the region. Argentina, Uruguay, and Brazil show notable advantages in this respect **(see Figure 5).**

Agricultural production has been growing in most countries of the region, though at very different rates. According to the FAO index (which measures the evolution of aggregate production in real terms, without the influence of price changes on its value), only Barbados, Trinidad and Tobago, and Venezuela experienced a negative average annual growth rate during the period from 2000 to 2021, while El Salvador and Jamaica hovered around 0%.

FIGURE 5. GROSS VALUE OF AGRICULTURAL PRODUCTION PER WORKER

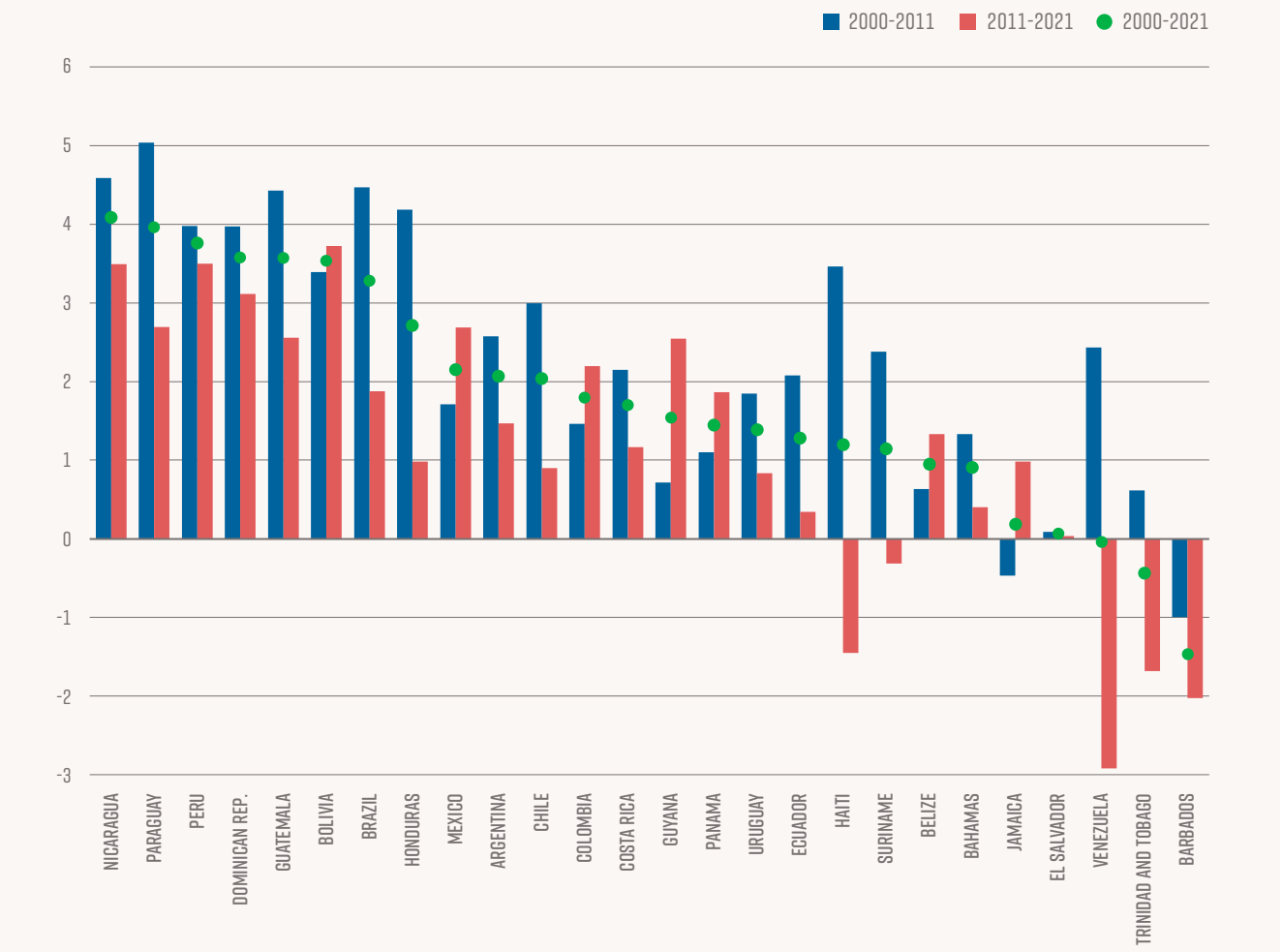
(IN 2014-2016 INTERNATIONAL DOLLARS, AVERAGE 2017-2021)



Source: own elaboration based on FAOSTAT and the International Labour Organization (ILO) for the estimation of the number of employees.

In contrast, Nicaragua and Paraguay showed annual growth rates exceeding 4% on average. Most countries grew at a higher rate during the first half of the period (2000 to 2011) than in the second half (2011 to 2021), when the prices of several commodities stopped rising. The opposite situation occurred only in Belize, Bolivia, Colombia, Guyana, Jamaica, Mexico, and Panama **(see Figure 6).**

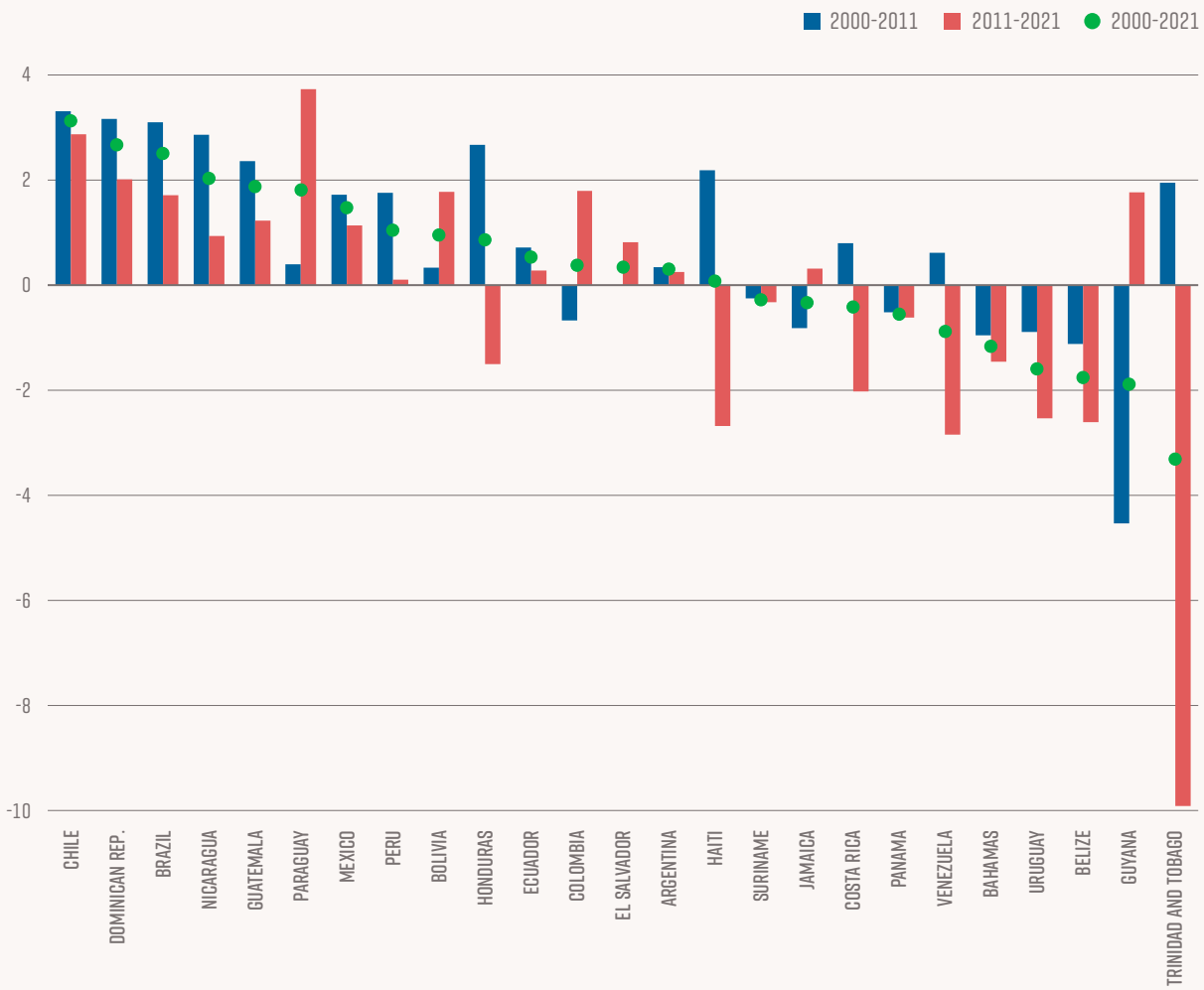
FIGURE 6. AVERAGE ANNUAL GROWTH RATES OF AGRICULTURAL PRODUCTION



Source: own elaboration based on data from FAOSTAT.

Just as production performance was heterogeneous within the region, so was total factor productivity (TFP). In 10 of the 25 countries for which information is available, TFP declined during the 2000-2020 period, and in five others, it grew at an average annual rate of less than 0.5% **(see Figure 7).** Similar to what happened with production, TFP generally grew at lower rates during the second half of the period (2011 to 2020). The most notable case is Trinidad and Tobago, where TFP averaged a 9.9% decline between 2011 and 2020, after growing 2% during the first half of the period (2000 to 2011). Only six countries (Bolivia, Colombia, El Salvador, Guyana, Jamaica, and Paraguay) had higher TFP growth rates during the second half of the period.

FIGURE 7. AVERAGE ANNUAL GROWTH RATES OF TOTAL FACTOR PRODUCTIVITY



Note: The TFP calculations come from the Economic Research Service of the United States Department of Agriculture (USDA-ERS). They cover the period 1961-2020 and include all borrowing countries of the IDB, except Barbados.

Source: own elaboration based on data from USDA-ERS.

In summary, **when comparing the periods 2000-2011 and 2011-2020, 16 of the 26 countries in LAC experienced a slowdown (or even a decline) in both agricultural production and TFP:** Argentina, Bahamas, Brazil, Chile, Costa Rica, Ecuador, Guatemala, Haiti, Honduras, Nicaragua, Peru, the Dominican Republic, Suriname, Trinidad and Tobago, Uruguay, and Venezuela. Conversely, only four countries (Bolivia, Colombia, Guyana, and Jamaica) showed an acceleration in both variables.

Regarding trade, it is often said that LAC is a net exporter of agri-food products. While this is true in aggregate terms, as with production, the reality behind it is much more complex and heterogeneous. The region has 14 net exporting countries, with exports highly concentrated: 70% come from Argentina (16%), Brazil (39%), and Mexico (16%).[12] Some countries show a clear upward trend in their net exports: Brazil, Costa Rica, Ecuador, Guatemala, Mexico (a recent net exporter since 2015), Nicaragua, Paraguay, and Peru (a net exporter since 2014). The rest exhibit stagnation or high volatility in their net exports: Argentina, Bolivia, Chile, Colombia, Honduras, and Uruguay. Meanwhile, 12 of the 26 countries in the region (11 of them in the Caribbean Basin) are net importers: Bahamas, Barbados, Belize (since 2018), El Salvador, Guyana, Haiti, Jamaica, Panama, the Dominican Republic, Suriname, Trinidad and Tobago, and Venezuela. Most of these countries show a strong trend toward higher net import values **(see Figure 44 in Annex 1).** Guyana could be the exception: it was a net importer only in 2021, although its net exports have shown a marked downward trend since the mid-2010s.

At the product level, there is also significant export concentration: five products (and their derivatives) account for 54% of the region's total external sales.[13] Soybeans and their derivatives (soybean meal and oil) alone represent approximately 27% of the total value. Next are beef (boneless, fresh or frozen) with 7%[14], followed by corn and its derivatives, coffee (green and extracts), and sugar (raw and refined), each accounting for approximately 6%. Table 5 shows the main exporting countries of these products, the amount they exported between 2019 and 2021, and their share of the region's total exports.

12. The Figures represent the average from 2017 to 2021 of each country's share in total exports (and positive net exports). The fourth-largest agri-food exporter in the region is Chile, with 5% of exports and 3% of positive net exports.

13. Average of the shares from 2019, 2020, and 2021. Calculations based on FAOSTAT data.

14. Including exports of live cattle, this proportion rises to 8%.

TABLE 5. MAIN EXPORTING COUNTRIES OF THE FIVE MAIN AGRI-FOOD EXPORT PRODUCTS FROM LAC (AVERAGE 2019-2021)

		SOYBEAN	BEEF	CORN	COFFEE	SUGAR
TOP EXPORTER	COUNTRY	BRAZIL	BRAZIL	ARGENTINA	BRAZIL	BRAZIL
	MILLIONS OF DOLLARS	38,622	7,988	6,804	5,690	7,859
	PERCENTAGE OF THE TOTAL*	66%	44%	50%	45%	67%
SECOND EXPORTER	COUNTRY	ARGENTINA	ARGENTINA	BRAZIL	COLOMBIA	MEXICO
	MILLIONS OF DOLLARS	14,545	3,069	5,881	2,968	1,367
	PERCENTAGE OF THE TOTAL*	25%	17%	44%	23%	11%
THIRD EXPORTER	COUNTRY	PARAGUAY	MEXICO	PARAGUAY	HONDURAS	GUATEMALA
	MILLIONS OF DOLLARS	3,420	2,385	$403	1,040	$665
	PERCENTAGE OF THE TOTAL*	6%	13%	3%	8%	6%
TOTAL	COUNTRY	LAC				
	MILLIONS OF DOLLARS	**58,580**	**18,360**	**13,626**	**12,706**	**11,598**
	PERCENTAGE OF THE TOTAL**	**57%**	**26%**	**31%**	**32%**	**29%**

* Refers to the total exports of LAC of those products.
** Refers to the total global exports of those products.
Source: own elaboration based on data from FAOSTAT.

A country's trade capacity is not only reflected in the volume and value of its exports but also in the diversity of products and the ability to supply high-income countries, which presumably pay higher prices. In this regard, there is again significant heterogeneity within the region.[15] Taking the highest-value transactions (which represent 50% of exports), only Argentina, Brazil, Chile, and Guatemala export to more than 10 countries. For Argentina and Brazil, 15% of these exports go to high-income countries; for Chile, this proportion is 53%, and for Guatemala, 73%. On the other hand, the Bahamas and Mexico conduct these main transactions

15. For more detail, it is suggested to refer to Table 12 in Annex 1.

with only one high-income country: the United States. However, while the Bahamas exports only one product in these main transactions, Mexico exports 12.[16]

In summary, **the previously presented indicators show the heterogeneity within LAC in terms of the agricultural sector's performance**. The commonly accepted notion of the region as "the world's breadbasket" often hides the differences between countries and, by extension, within the region itself. However, some common patterns can be observed. As mentioned, in most countries, production grew at a higher rate during the first half of the period (2000 to 2011) than during the second half (2011 to 2021), and the same occurred with TFP. During the period analyzed, 16 of the 26 LAC countries experienced a slowdown (or even declines) in both agricultural production and TFP.

The next section reviews the main agricultural support policies and their relationship with key economic variables in the region. Following this, a review of support estimates is conducted.

THE COMMONLY ACCEPTED GENERALIZATION OF THE LAC REGION AS "THE WORLD'S BREADBASKET" OFTEN HIDES THE DIFFERENCES BETWEEN COUNTRIES AND, BY EXTENSION, WITHIN THE REGION ITSELF. HOWEVER, SOME COMMON PATTERNS CAN STILL BE OBSERVED

16. The case of Mexico is interesting because, although it has a diverse export basket in terms of products, its export destinations are highly concentrated in the United States, which accounts for 92% of its agri-food exports.

3. REVIEW OF SUPPORT ESTIMATES FOR THE AGRICULTURAL SECTOR

Most governments around the world show an interest in the economic, social, and environmental conditions of their rural areas, particularly in the development of their agricultural sectors (Rodríguez et al., 2019). They design and implement agricultural policies, which can broadly be defined as any government intervention that affects the sector's decisions regarding investment, production, pricing, or distribution of its products (Owens, 1978). Governments intervene in the agricultural sector for reasons ranging from the desire to increase and stabilize producers' incomes to aspirations of ensuring food security and quality for consumers, creating jobs, alleviating rural poverty, promoting gender equity and opportunities for youth, fostering inclusive territorial development, influencing the trade balance, protecting the environment, affecting the exchange rate, increasing tax

revenues, and responding to political pressures from agricultural groups (Anderson et al., 2014; Díaz-Bonilla et al., 2019; Lipper et al., 2022; Materia et al., 2022; Otsuka and Shenggen, 2021; Oyhantçabal and Rodríguez, 2023; Rodríguez and Meneses, 2010; Waarts et al., 2022).

This section analyzes the support that countries provide to their agricultural sectors. For this, the extensive Agrimonitor database will be utilized, which contains estimates of various types of support granted to the sector. As previously mentioned, the estimates follow a methodology defined in 1987 by the OECD (OECD, 2016). Although the estimates correspond to multiple types of support and vary in specificity, there are four key variables at a general level: **Total Support Estimate (TSE), Producer Support Estimate (PSE), General Services Support Estimate (GSSE), and Consumer Support Estimate (CSE).**[17] These variables are interrelated as follows:

$$TSE = GSSE + PSE + TCT \quad (1)$$

Where TCT represents the transfers to consumers from taxpayers, which are part of the CSE (see below). Additionally, the Producer Support Estimate (PSE) can be broken down as follows:

$$PSE = CO + OBP \quad (2)$$

Where CO is the support based on commodity products, and OBP represents various budgetary payments (including payments based on input usage, land area, animals, income, criteria other than commodities, and other payments).

Finally, CO is further decomposed as follows:

$$CO = MPS + PO \quad (3)$$

Where MPS refers to market price supports, and PO refers to production-based payments. Substituting PSE with its various components, the original equation can be rearranged as follows:

$$TSE = GSSE + (OBP + PO) + (MPS + TCT) \quad (4)$$

GOVERNMENTS INTERVENE IN THE SECTOR FOR REASONS RANGING FROM THE DESIRE TO INCREASE AND STABILIZE PRODUCERS' INCOMES TO ASPIRATIONS OF ENSURING FOOD SECURITY AND QUALITY FOR CONSUMERS, CREATING JOBS, OR ALLEVIATING RURAL POVERTY

17. For more detailed information on the components and estimation of each variable, it is suggested to consult the OECD Producer Support Estimate Manual (OECD, 2016).

Thus, total support to the sector (TSE) actually consists of three categories: support through general services (GSSE), budgetary payments to producers (BPP, based on various criteria, BPP = OBP + PO), market price support to producers (MPS) and consumers (TCT). According to the OECD, MPS are "transfers from consumers and taxpayers to agricultural producers that arise from policies generating a gap between domestic market prices and border prices of a specific basic agricultural good, measured at the farm level" (OECD 2016, 30). Meanwhile, GSSE is defined as "the annual monetary value of gross transfers resulting from public policies that create favorable conditions for the agricultural sector, through the development of public or private services and through institutions and infrastructure, regardless of their objectives and impacts on agricultural production and income or on the consumption of agricultural products" (OECD 2016, 16).

Then, the Consumer Support Estimate (CSE) is defined as follows:

$$CSE = -TPC - OTC + TCT + EFC \quad (5)$$

Where TPC represents transfers from consumers to producers, OTC are other transfers from consumers, and EFC refers to excess feed costs. All components of the CSE are, in fact, supports (positive or negative) generated by distortions in market prices, and some of them are part of the MPS component of PSE (though with the opposite sign). Thus, when there are distortions in market prices of agricultural products or inputs, there is an inverse relationship between the PSE and the CSE.

3.1. TOTAL SUPPORT ESTIMATE

Figure 8 presents the TSE expressed as a percentage of GDP, of agricultural GDP, and in relative terms to agricultural land area, allowing for comparisons among countries in the region.

The TSE as a percentage of agricultural GDP (panel b) is the most appropriate measure for comparing the level of support received by the sector, as it relates to what is produced, regardless of its weight in the overall economy. In a World Bank study (Damania et al., 2023), the global TSE, estimated for 84 countries between 2016 and 2018, represented 0.9% of GDP and 18% of agricultural GDP, similar levels to those in LAC.

FIGURE 8. ESTIMATED TOTAL SUPPORT AS A PERCENTAGE OF GDP AND AGRICULTURAL GDP, AND PER LAND AREA

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

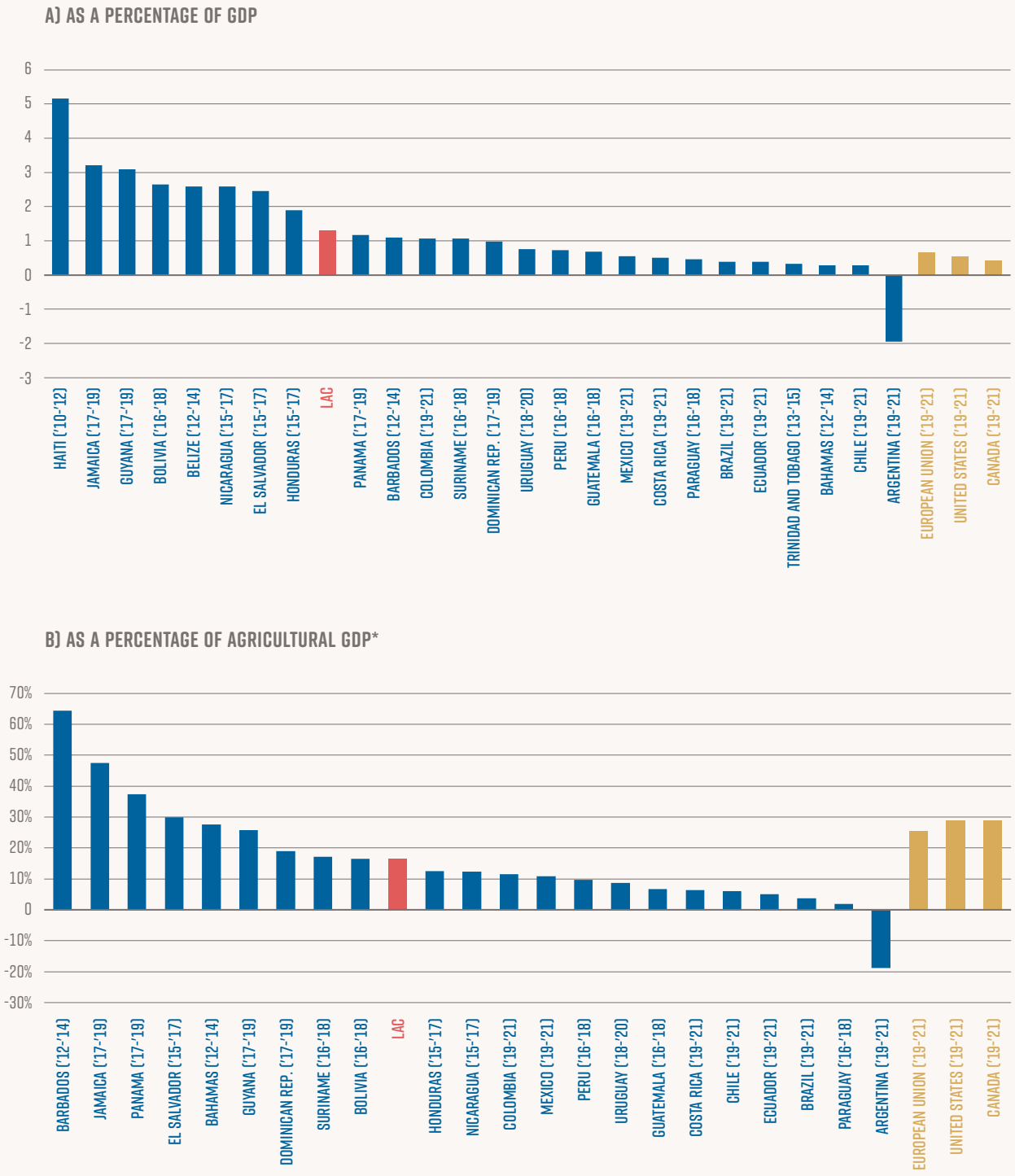


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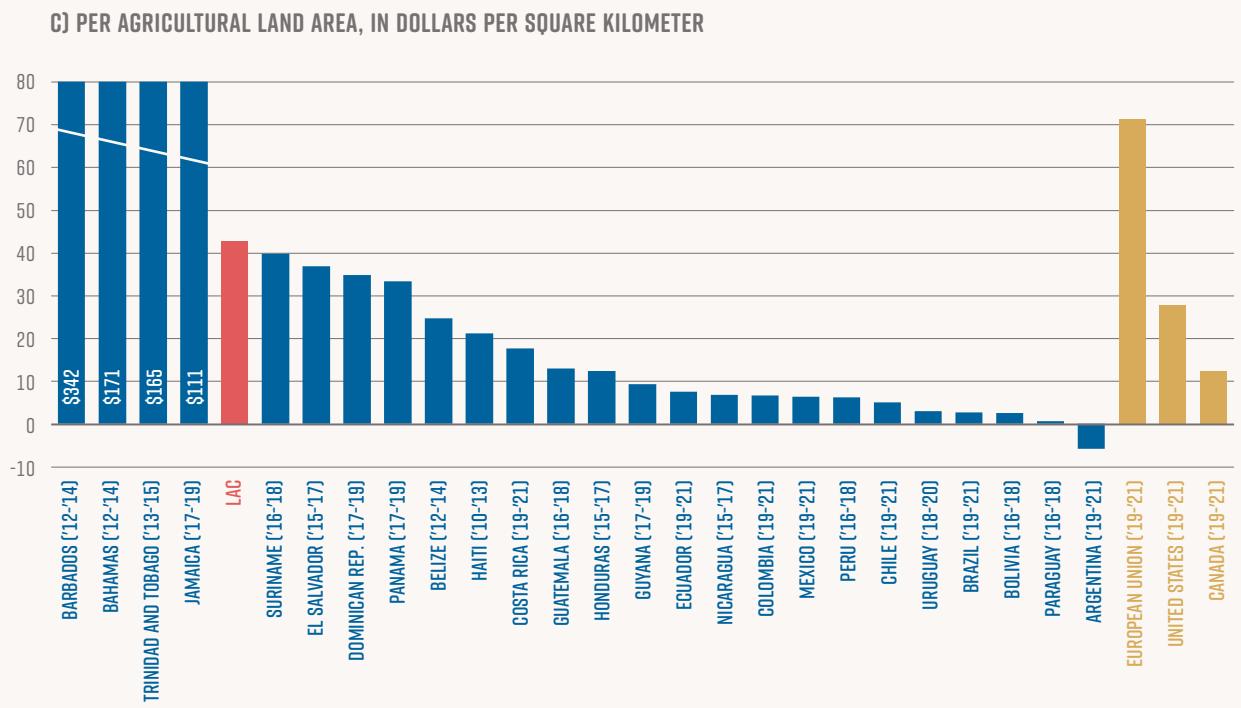
FIGURE 8. ESTIMATED TOTAL SUPPORT AS A PERCENTAGE OF GDP AND AGRICULTURAL GDP, AND PER LAND AREA

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses above the country name. In panel c, the columns corresponding to Barbados, Bahamas, Trinidad and Tobago, and Jamaica are truncated, so the values for those countries are at the bottom of their columns. The LAC column is the simple average of the values obtained for each country.

* Figure 45 in Annex 1 shows the evolution of this indicator by country.

Source: own elaboration based on data from Agrimonitor.

Panels a and b show a similar pattern: generally, smaller countries tend to provide higher levels of support (though there are exceptions, such as Costa Rica, which has a relatively low level of support). This pattern is much more pronounced when support is measured in terms of agricultural land area (panel c): here, four Caribbean countries present extreme values that raise the average for LAC (without these four countries, the average would be US$14 per km^2 of agricultural land, only slightly higher than that of Guatemala).

The case of Bolivia is interesting because the share of agricultural GDP in total GDP is relatively high (12%). Consequently, the country shows a high amount in panel a, and an intermediate amount in panel b, while its large land and agricultural area results in a low amount in panel c.

Argentina also stands out: it is the only country with a negative support estimate for the agricultural sector, meaning that, in net terms, agricultural producers transfer resources to the rest of the population, either through taxes or by selling their products at artificially low prices. The Figure also shows that Canada, the United States, and the EU have substantially higher levels of support compared to many LAC countries, except when TSE is presented as a percentage of GDP, as the agricultural sector represents a relatively smaller fraction of their economies.

3.2. SUPPORT THROUGH PUBLIC AGRICULTURAL EXPENDITURE

Public agricultural expenditure, or Total Budgetary Support Estimate (TBSE) is the portion of total support to the sector that comes from budgetary resources; that is, TSE minus price supports (MPS + TCT). Naturally, TBSE is lower than TSE unless the latter is negative (as in the case of Argentina). To facilitate international comparisons, these budgetary supports are presented as a percentage of agricultural GDP **(Figure 9).**

When comparing panel b of Figure 8 with Figure 9, at least three observations can be highlighted. First, TBSE represents, on average, a much smaller fraction of agricultural GDP in LAC (5%) than TSE (almost 16%). This indicates that in many LAC countries, support through prices constitutes a substantial part of the total support to the sector.

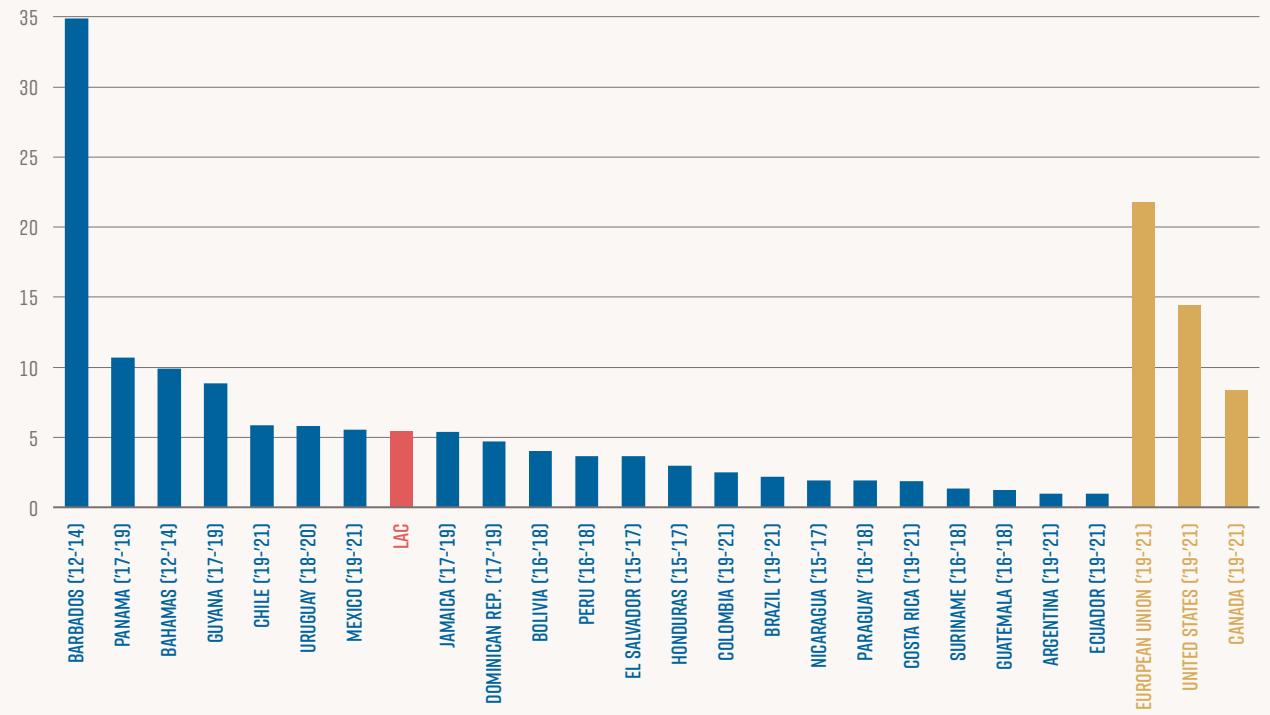
The case with the largest difference between TSE and TBSE is Jamaica, with a gap of 42 percentage points (pp) of its agricultural GDP. This is followed by Barbados (29 pp), Panama (27 pp), and El Salvador (26 pp). In Paraguay and Chile, where price support is minimal, TBSE and TSE are almost equal. Second, this illustrates the heterogeneity within the region. The ranking that prevails in terms of TSE does not hold in terms of TBSE.

The third observation is that the developed countries used for comparison (Canada, the United States, and the EU as a whole) have substantially higher TBSE than LAC countries, except for Barbados; this indicates significant budgetary support for the agricultural sector. In the case of the EU, the difference between TSE and TBSE is only 3.7 pp, indicating that almost all its support to the agricultural sector comes from budgetary resources. In the cases of the United States and Canada, TBSE is substantially

lower than TSE (by 50% or 14.5 pp, and by 71% or 21 pp, respectively), yet still higher than in most LAC countries. The next section will analyze how this budgetary support is allocated to public goods.

FIGURE 9. PUBLIC AGRICULTURAL EXPENDITURE AS A PERCENTAGE OF AGRICULTURAL GDP

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses above the country name. The LAC column is the simple average of the values obtained for each country. Figure 46 in Annex 1 shows the evolution of this indicator by country.

Source: own elaboration based on data from Agrimonitor.

3.3. GENERAL SERVICES SUPPORT ESTIMATE

The TSE (like TBSE) provides very general information that does not distinguish by type of support provided to the sector. Two countries might allocate the same amount of resources to support their agricultural sectors, but in very different ways and with varying results. **To analyze the type of support to the sector, a first step is to observe the level of support provided through general services (GSSE).** These include all services (or even goods) provided by the state that directly support agricultural activities and have characteristics of public goods in the economic sense[18]. This means these services support multiple producers (and even consumers) simultaneously —for example, animal and plant health, and food safety. According to the OECD's PSE Manual (OECD, 2016), for the purposes of GSSE, general services are classified as follows: (i) agricultural research and development, (ii) food control and inspection, (iii) development and maintenance of rural infrastructure, (iv) promotion and marketing, (v) public storage costs, and (vi) miscellaneous.

Analyzing GSSE is relevant because these services provide the necessary framework for agricultural development based on public goods. For instance, rural roads: if they are absent or in poor condition, transporting inputs to farms and products to markets becomes much harder, more expensive, and results in greater losses, all of which reflects lower productivity, competitiveness, and profitability. This analysis is also important because, by benefiting both small and large producers simultaneously and indiscriminately, general services facilitate successful participation in sector activities.

The importance of investment in general services has been widely recognized and demonstrated. A series of studies (Islam and López 2011, López and Galinato 2007, López and Palacios 2014, Sills et al. 2015) indicate that it contributes to poverty reduction and improves natural resource management. Furthermore, they found that in LAC, a simple partial reallocation (equivalent to 10 pp) of public resources from private subsidies to investments in general services could increase agricultural per capita income

18. In economic theory, a pure public good has two key characteristics: first, it is very difficult to exclude or prevent anyone from consuming it; second, one person's consumption of the good does not affect another person's consumption. These characteristics are met to varying degrees, leading to the emergence of "club goods" and "common resources."

in the long term by up to 5% (Anríquez et al. 2016; López and Galinato 2007).

Figure 10 compares the levels of investment in general services as a percentage of TSE (panel a) and TBSE (panel b) in the last three years available for each country. Beyond the aforementioned heterogeneity within the region, the Figure shows that, compared to Canada, the United States, and the EU, a high proportion of LAC's support to the agricultural sector is directed toward investment in general services. This is particularly notable when GSSE is measured as a percentage of budgetary supports (panel b).

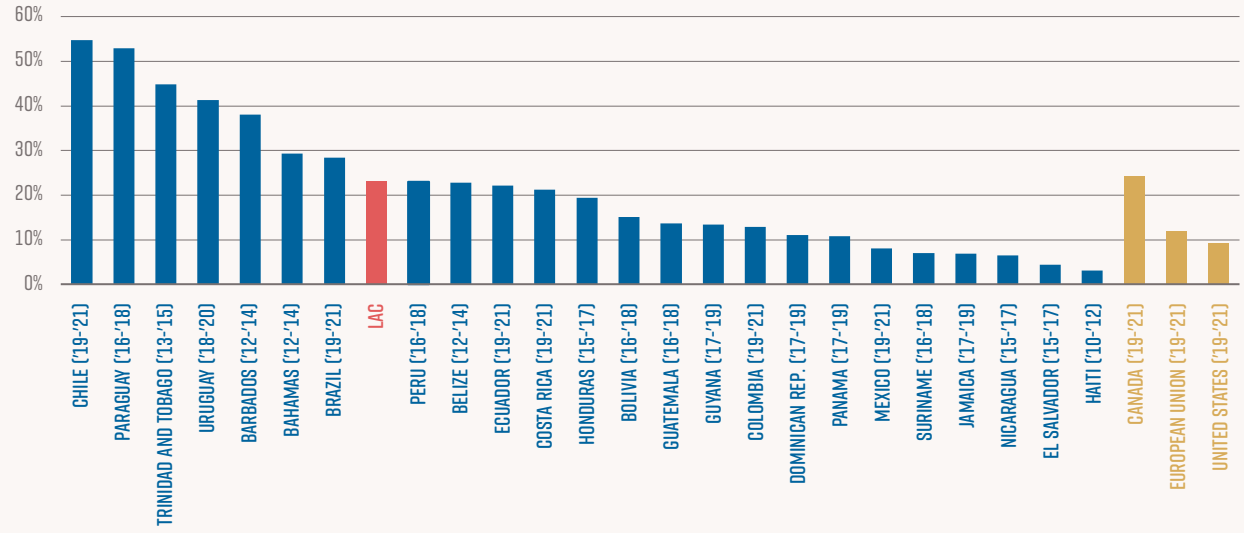
Some of the smaller countries in the region (Suriname, Bahamas, Barbados, Trinidad and Tobago, Costa Rica, and Honduras) invest particularly high proportions of their budgetary resources in this type of public good. This might be partially related to economies of scale in the provision of these services: the investments that must be made regardless of the number of beneficiaries (the so-called fixed costs) represent a larger fraction of agricultural GDP in small countries than in larger ones. While the presence of economies of scale in the provision of general services might play a role in the high GSSE levels of small countries, this influence diminishes in larger countries. Thus, in Argentina, Brazil, and Mexico, the levels are very different. Mexico stands out for having a very low investment in general services (relative to its TBSE) compared to other LAC countries, but aligned with the United States and the EU. According to the World Bank study by Damania et al. (2023), the global GSSE represents 18% of TSE, a percentage slightly lower than that of LAC. In all cases, they are significantly lower than the support to producers, as presented in the next section.

IN COMPARISON WITH CANADA, THE UNITED STATES, AND THE EU, A RELATIVELY LARGE PROPORTION OF THE SUPPORT PROVIDED BY LAC TO THE AGRICULTURAL SECTOR IS DIRECTED TOWARDS INVESTMENT IN GENERAL SERVICES

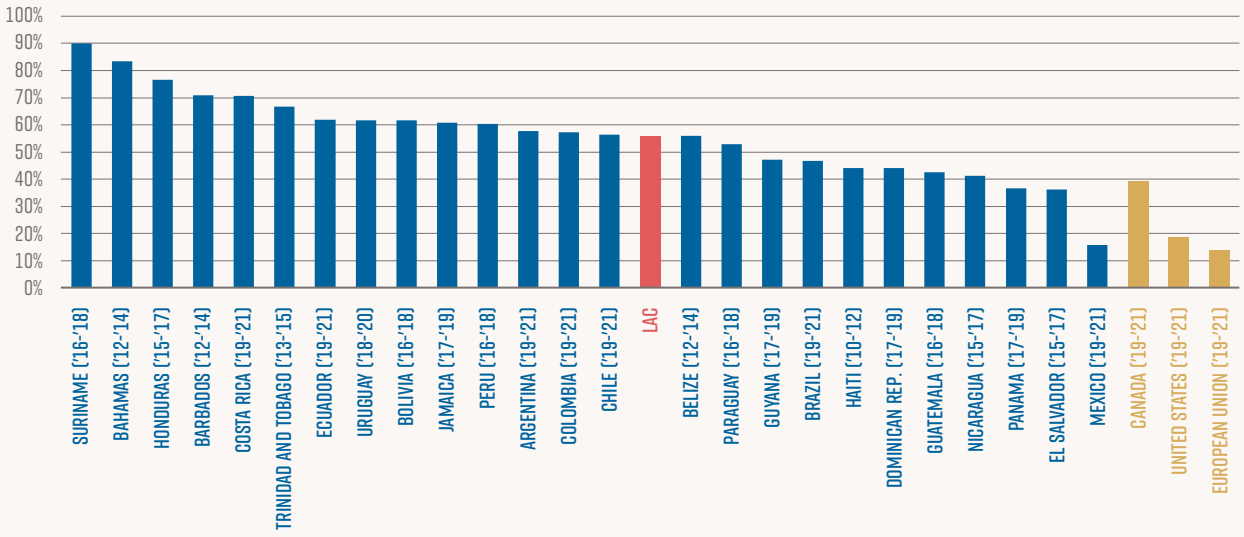
FIGURE 10. ESTIMATED SUPPORT FOR GENERAL SERVICES

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

A) AS A PERCENTAGE OF TOTAL SUPPORT



B) AS A PERCENTAGE OF PUBLIC AGRICULTURAL EXPENDITURE



Note: The years used to calculate the average are shown in parentheses above the country name. In panel a, Argentina is excluded because its TSE is negative. The LAC column is the simple average of the values obtained for each country. Figures 47 and 48 in Annex 1 present the evolution of the GSSE as a percentage of the TSE and as a percentage of the TBSE, respectively, by country.

Source: own elaboration based on data from Agrimonitor.

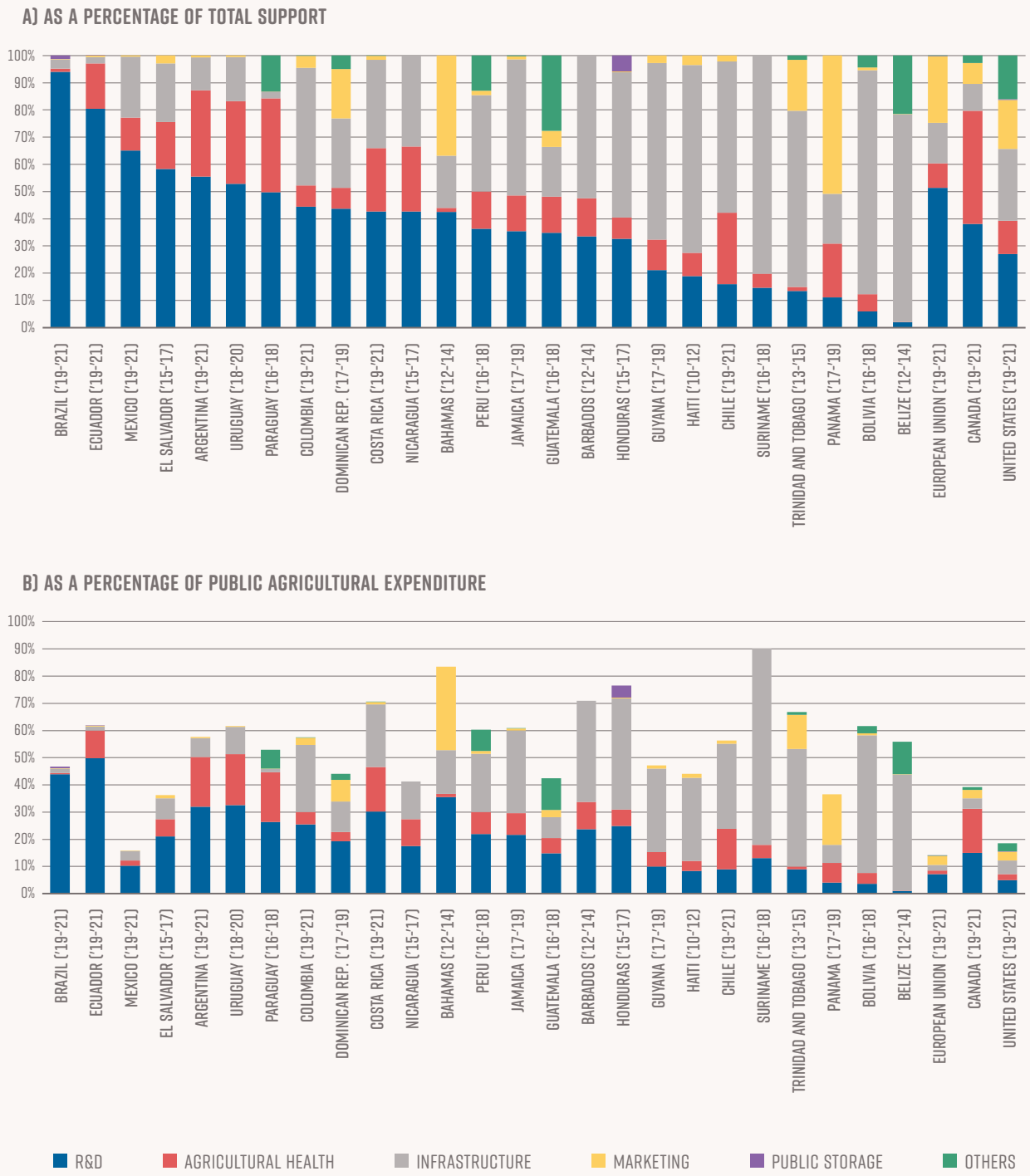
Beyond the amounts invested,[19] it is important to analyze the specific services to which these investments are directed. The composition of investment in general services varies significantly within LAC. For instance, while Belize allocates only 2% of its resources to research and development, Brazil dedicates 94% —primarily through the Brazilian Agricultural Research Corporation (EMBRAPA)— a percentage even higher than that of the EU **(see Figure 11, panel a)**. Ecuador also allocates a significant share to agricultural research and development (81%), with Mexico following in third place (65%), despite investing a smaller fraction of its TBSE in general services **(Figure 11, panel b).**

On the other hand, Suriname invests a large portion into agricultural infrastructure development (80% of its GSSE or 72% of its TBSE), while Brazil, Ecuador, and Paraguay invest very little in this area. Argentina, Paraguay, and Uruguay (along with Chile and Costa Rica to a lesser extent) lead in investments in sanitary inspection and control services (animal and plant health), which are increasingly important for agricultural exports due to rising import requirements of importing countries. Interestingly, Brazil, the region's largest agricultural exporter, allocates a relatively small percentage to these services. Notably, the United States shows a balanced distribution of investments in general services **(Figure 11, panel a).**

19. For a detailed overview of the evolution of the amounts invested in GSSE, please refer to Figure 49 in Annex 1.

FIGURE 11. COMPONENTS OF SUPPORT THROUGH GENERAL SERVICES

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses, above the name of the country.

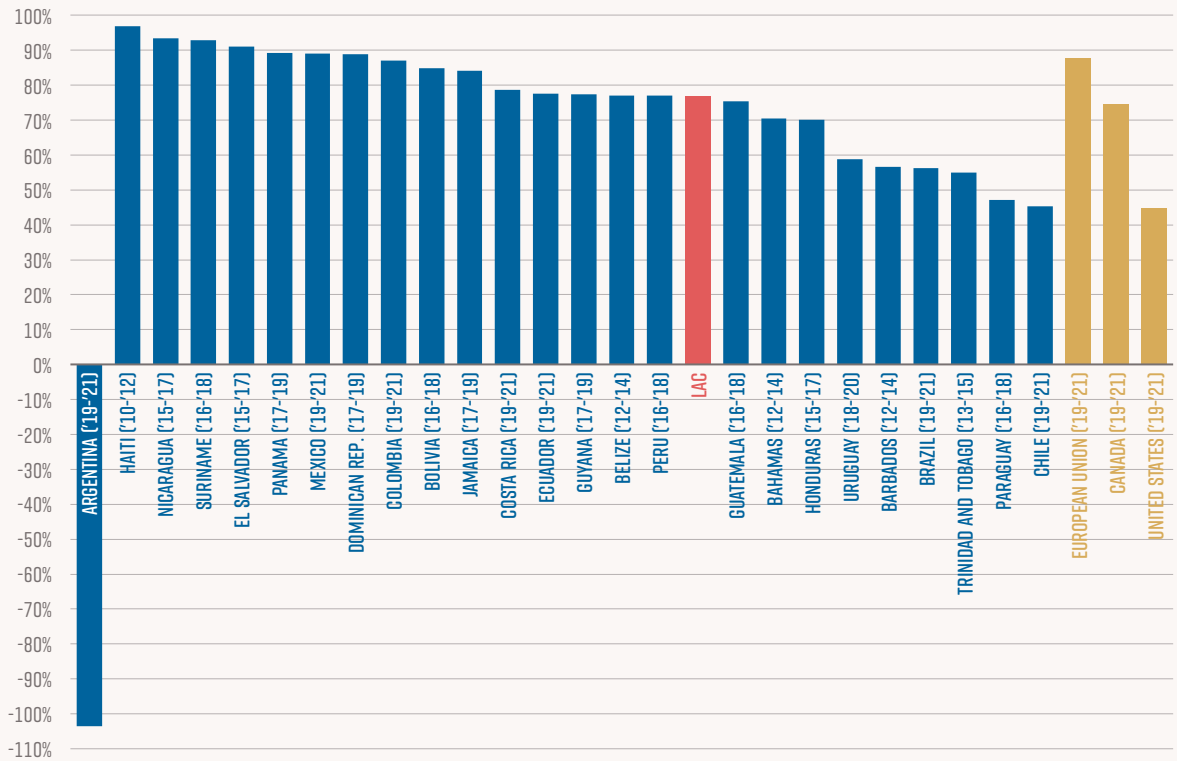
Source: Own elaboration based on Agrimonitor data.

3.4. PRODUCER SUPPORT ESTIMATE

Another very important component of total support to the agricultural sector is the support given to producers (PSE). Since transfers from taxpayers to consumers are usually small, the PSE complements investments in general services, which logically accounts for about 80% of the total support granted to the sector in the region **(Figure 12)**. The EU and Canada allocate support to producers in a proportion of their total support to the sector similar to or greater than the average in LAC. According to the World Bank study by Damania et al. 2023, global PSE represents 71% of TSE, a slightly lower percentage than that of LAC; in any case, it is the type of support that accounts for most of the support given to the sector. The difference lies in how that support is delivered: directly or via market prices (this discussion is revisited later).

FIGURE 12. PRODUCER SUPPORT (PSE) AS A PERCENTAGE OF TOTAL SUPPORT (TSE)

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



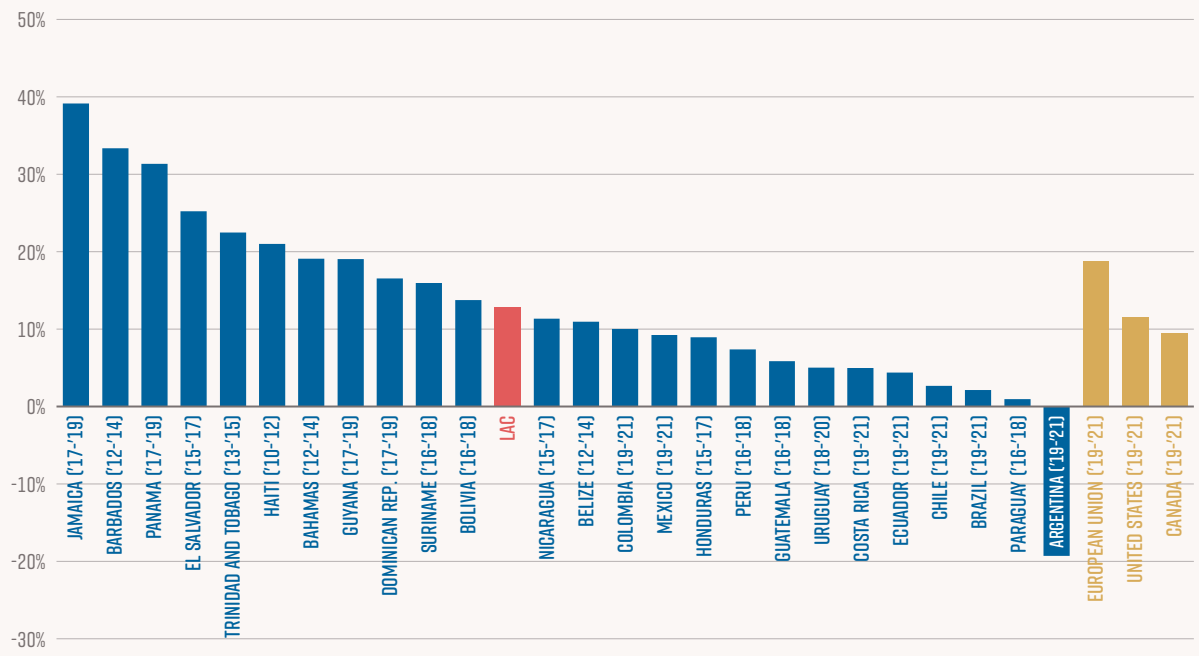
Note: The years used to calculate the average are shown in parentheses, above the name of the country. The column for Argentina is shown with a negative sign to indicate that the PSE is negative (arithmetically, since the TSE is also negative, the PSE/TSE ratio results in a positive value).

Source: Own elaboration based on Agrimonitor data.

Beyond its share of total support, the PSE must also be analyzed in terms of its weight in producers' incomes, which provides a better idea of the impact that such support has on their profitability. As shown in **Figure 13**, the differences between countries in the region regarding this variable are quite pronounced: while in Paraguay, the PSE represents only 1% of producers' agricultural income, in Jamaica, this proportion is close to 40%.[20] In general, countries where producer support accounts for a larger fraction of agricultural income tend to be small economies in the Caribbean and Central America; the larger economies in the region, on the other hand, fall below the regional average. In EU countries, producer support also represents a relatively high percentage (19%) of their agricultural income, comparable to what happens in the Bahamas and Guyana.

FIGURE 13. PRODUCER SUPPORT AS A PERCENTAGE OF AGRICULTURAL INCOME

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses, above the name of the country.

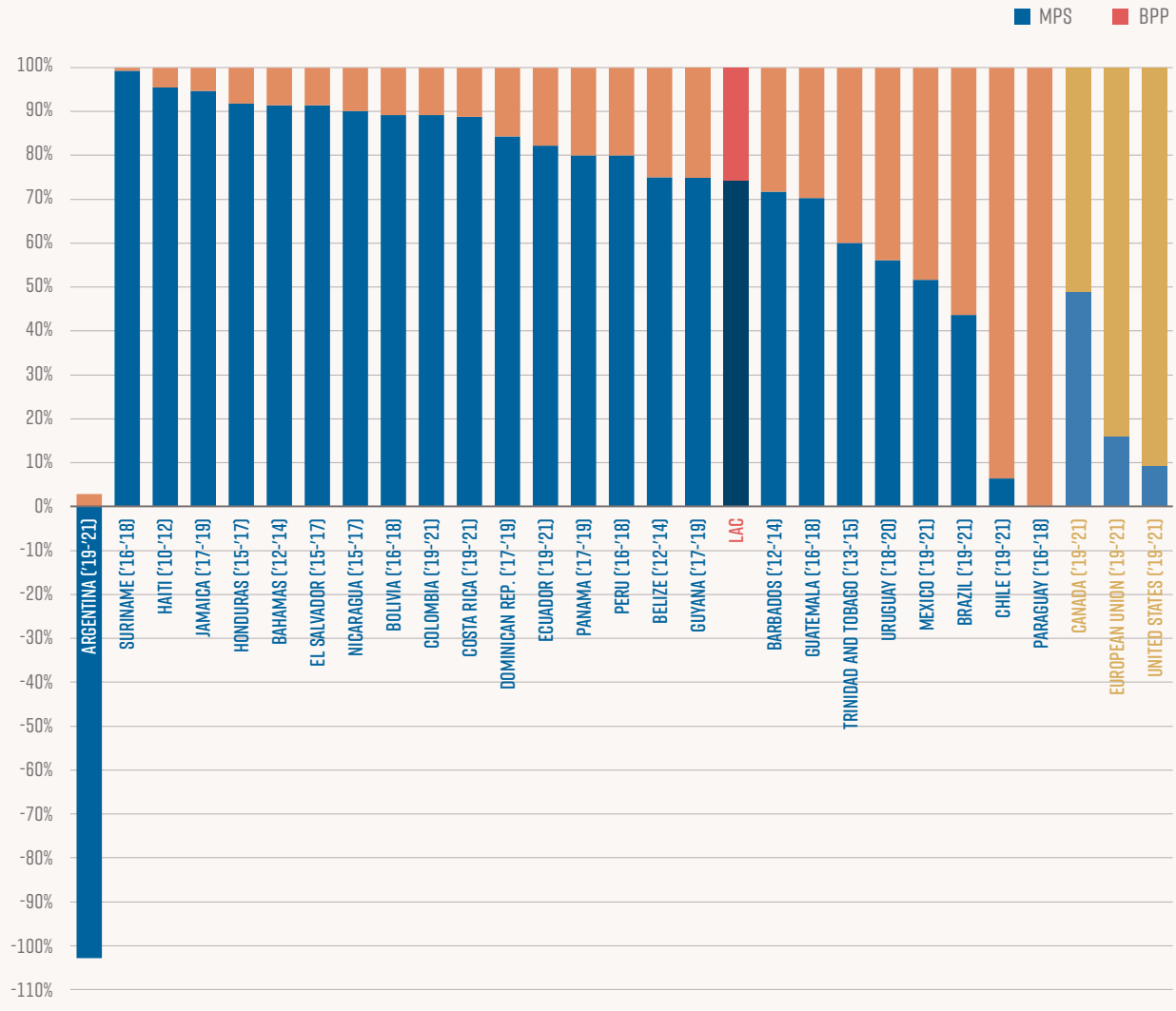
Source: Own elaboration based on Agrimonitor data.

20. Argentina is an outlier, which is why it is not included in this comparison of extreme values.

As seen in equations 2 to 4, the PSE can be broken down into two parts: market price support and budgetary payments to producers. This breakdown is interesting because it separates the PSE into a component of support through market price alterations (which does not represent a government expenditure) and a component of support using budgetary resources, as shown in the following Figure.

FIGURE 14. PERCENTAGE DECOMPOSITION OF PRODUCER SUPPORT (PSE)

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses, above the name of the country. The column for Argentina is shown with a negative sign to indicate that the MPS is negative and the BPP is positive (arithmetically, since the PSE is also negative, the MPS/PSE ratio results in a positive value and the BPP/PSE ratio results in a negative value).

Source: Own elaboration based on Agrimonitor data.

3.4.1. MARKET PRICE SUPPORT

MPS are "transfers from consumers and taxpayers to producers resulting from policies that create a gap between domestic prices and border prices" (OECD 2016, 30). These typically correspond to trade policies, such as export or import taxes or tariffs, which generate a price lower or higher than what would emerge in the absence of these measures. Therefore, they represent a market distortion, as they create prices different from those that would prevail in a competitive market. A positive MPS means that the prices received by producers are higher than reference prices, thus implying a transfer from consumers to producers or the state; if the MPS is negative, the opposite occurs.

MPS does not involve public budget expenditures for governments, making it an appealing instrument for market distortion. As shown in **Figure 14**, in most LAC countries, nearly three-quarters (74%) of producer support comes from market price support. Only three countries in the region (Brazil, Chile, and Paraguay) have MPS levels below 50% of the PSE, and in two of these countries, these levels are unusually low: Chile at 6% and Paraguay at 0%. Argentina is a special case because its support, being primarily through MPS, becomes negative and results in support for consumers instead.[21]

3.5. CONSUMER SUPPORT ESTIMATE

As previously mentioned, support given to producers through market prices typically represents a transfer from consumers to producers (or vice versa if MPS is negative), creating an inverse relationship between MPS and support to consumers (CSE). **In LAC, almost all countries have a negative level of CSE.** The exceptions are Paraguay, which provides no consumer support, and Argentina, where export tax policies reduce domestic prices (negative MPS), resulting in significant support to consumers.

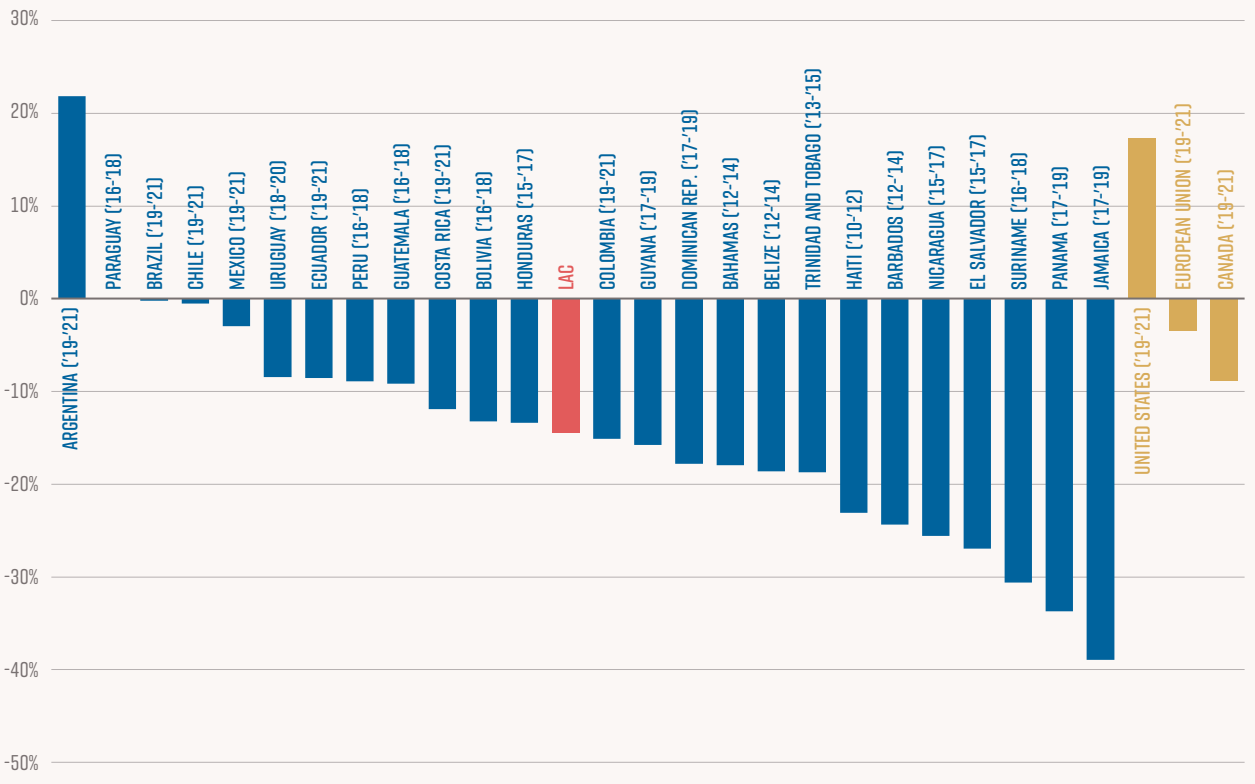
Figure 15 shows CSE as a percentage of consumer spending. There is a strong correlation with the support provided to producers as a percentage of their income **(Figure 13)**: countries with higher PSE as a percentage of producer income tend to

21. Figure 50 presents the evolution of MPS as a percentage of the agricultural GDP, by country in LAC.

have lower levels of CSE (e.g., Jamaica), and vice versa (e.g., Argentina). It's important to note the exceptions: some countries with low consumer spending have negative consumer support that represents a large percentage of that spending, resulting in relatively high CSE levels (in absolute terms) among LAC countries —such as Suriname, Nicaragua, and Belize. Conversely, in countries like Barbados, Trinidad and Tobago, and the Bahamas, CSE represents a smaller percentage of consumer spending (compared to other countries) than the proportion of PSE in producer income.

FIGURE 15. CONSUMER SUPPORT AS A PERCENTAGE OF CONSUMPTION EXPENDITURE

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Note: The years used to calculate the average are shown in parentheses, above the name of the country. Figure 51 in Annex 1 presents the evolution of this indicator by country.

Source: Own elaboration based on Agrimonitor data.

3.6. GENERAL ANALYSIS

Agricultural support policies in LAC tend to rely on mechanisms like market price alterations, often at the expense of consumers. This may partly be because such support does not require government budget expenditure. At the same time, budgetary support for the sector, including investments in general services and public goods crucial for its development, is typically low or very low.

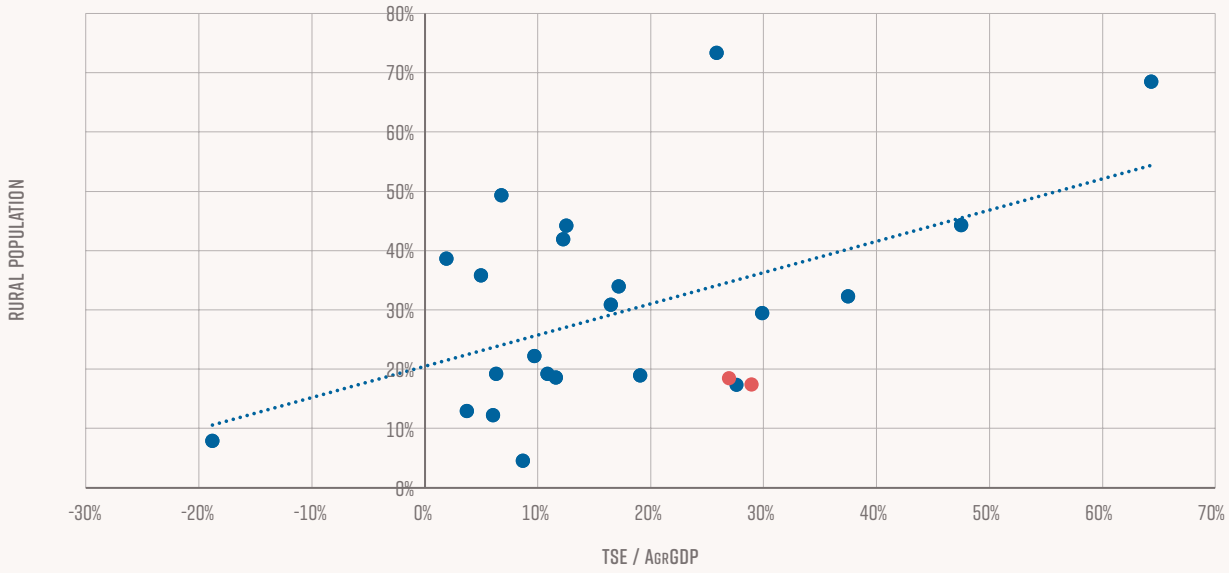
To move beyond simply describing recent levels of the different types of support to the sector, we will now analyze the relationship between these supports and some key economic variables. A first observation is that there seems to be a possible[22] positive correlation between the level of total support to the sector and the percentage of the rural population in a country **(Figure 16, panel a).** This relationship also holds between agricultural public spending and the rural population percentage **(Figure 16, panel b).** This is fairly intuitive: as the rural population makes up a larger segment of society, it becomes necessary to provide more support to what is likely the main economic activity for that population segment. Olper et al. (2014) show that democratization processes in developing countries contributed to an increase in the Nominal Rate of Assistance (NRA) in favor of farmers. However, the correlation between agricultural employment percentage and support to the sector appears to be inverse **(Figure 16, panel c)** when considering both total support and just public agricultural spending **(Figure 16, panel d).**

22. This possibility is inferred from a visual analysis of a scatter plot with a limited number of observations (due to the small number of countries analyzed). No statistical analysis has been conducted to determine whether this correlation is statistically significant or holds with larger samples.

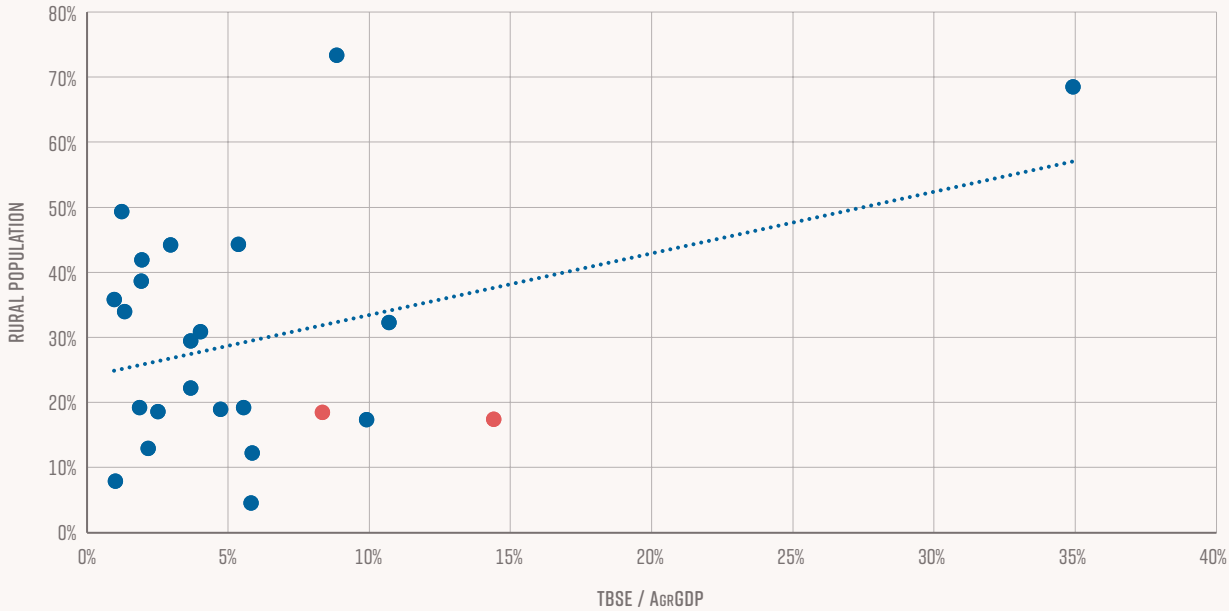
FIGURE 16. SUPPORTS TO THE SECTOR, RURAL POPULATION, AND AGRICULTURAL EMPLOYMENT

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

A) TOTAL SUPPORT AND RURAL POPULATION



B) PUBLIC AGRICULTURAL EXPENDITURE AND RURAL POPULATION



(Continued on next page)

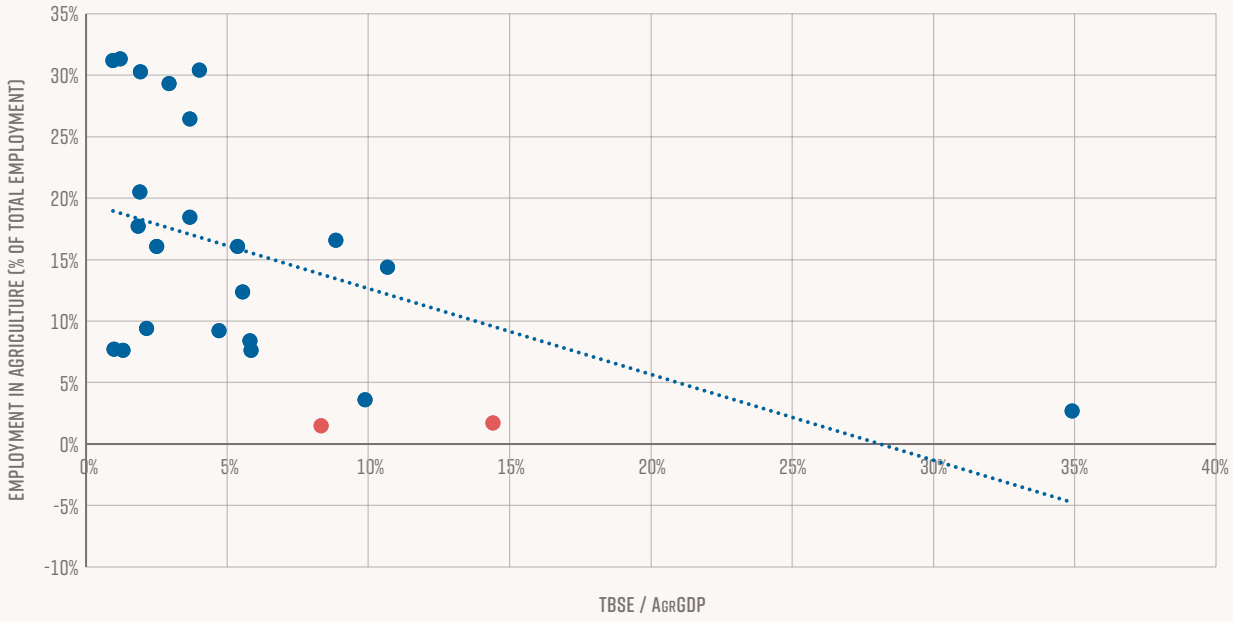
Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

FIGURE 16. SUPPORTS TO THE SECTOR, RURAL POPULATION, AND AGRICULTURAL EMPLOYMENT

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

C) TOTAL SUPPORT AND AGRICULTURAL EMPLOYMENT

D) PUBLIC AGRICULTURAL EXPENDITURE AND SECTOR EMPLOYMENT



Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

If extra regional countries (Canada and the United States)[23] and those showing extreme values (Bahamas, Barbados, Guyana, Jamaica, and Panama) are excluded, a more coherent pattern emerges between levels of support and the percentage of the rural population or the share of agricultural employment. At the same time, an interesting pattern emerges: while there is a possible positive correlation between total support for the sector and the percentage of agricultural employment (and the rural population), there is a negative correlation between support via budget spending and the percentage of agricultural employment (and the rural population) **(Figure 17).**

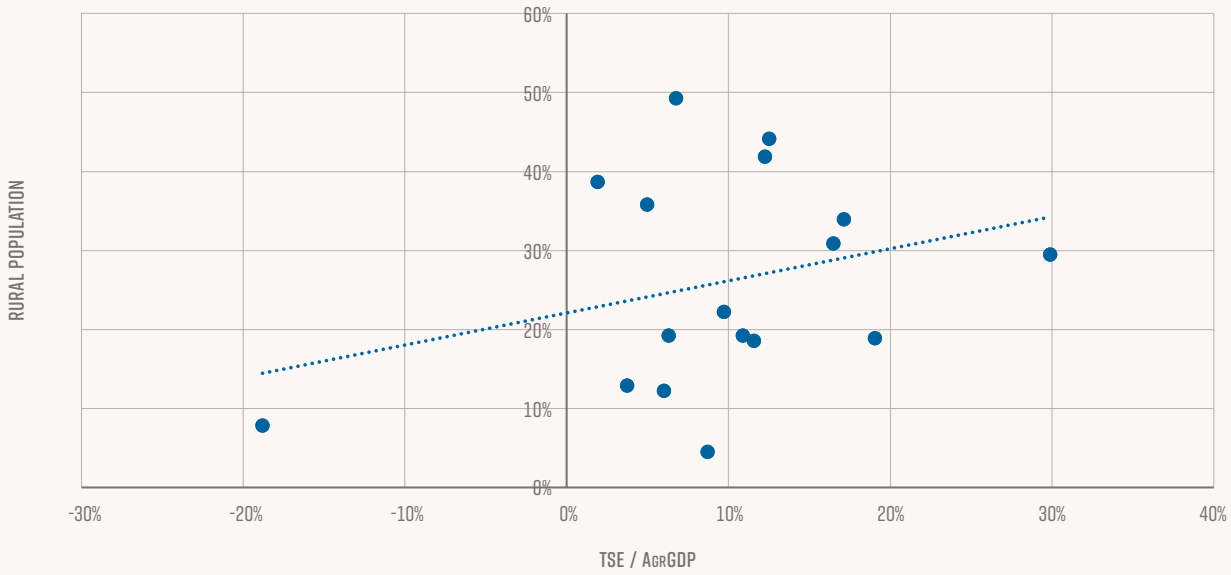
One possible explanation is that in those countries where the percentage of the rural population and agricultural employment are relatively lower, governments respond to the demand for sector support predominantly through price mechanisms rather than through the TBSE. In this regard, Mitchell and Moro (2006) show that price-based instruments may be more attractive for governments when there is ex ante uncertainty about the total amounts of support needed, leading to inefficient targeting. Swinnen (2018) states that in many developing countries, the system for managing and enforcing income taxes or subsidies can be too costly to implement. In that context, trade taxes (import or export tariffs) often serve as a significant —or even the only substantial— source of fiscal revenue. Various studies (Soto Baquero et al. 2006, Foster et al. 2011, López 2007) have shown that public spending (especially oriented toward public goods) plays a significant role in agricultural development, but its allocation is also linked to the country's budget availability. Given that the weight of the agricultural sector in the economy is negatively associated with income levels, it is possible that these countries have fewer fiscal resources to provide support through the TBSE.

23. There are no available data on the rural population and agricultural employment for the EU, so those countries are not included in the corresponding Figures.

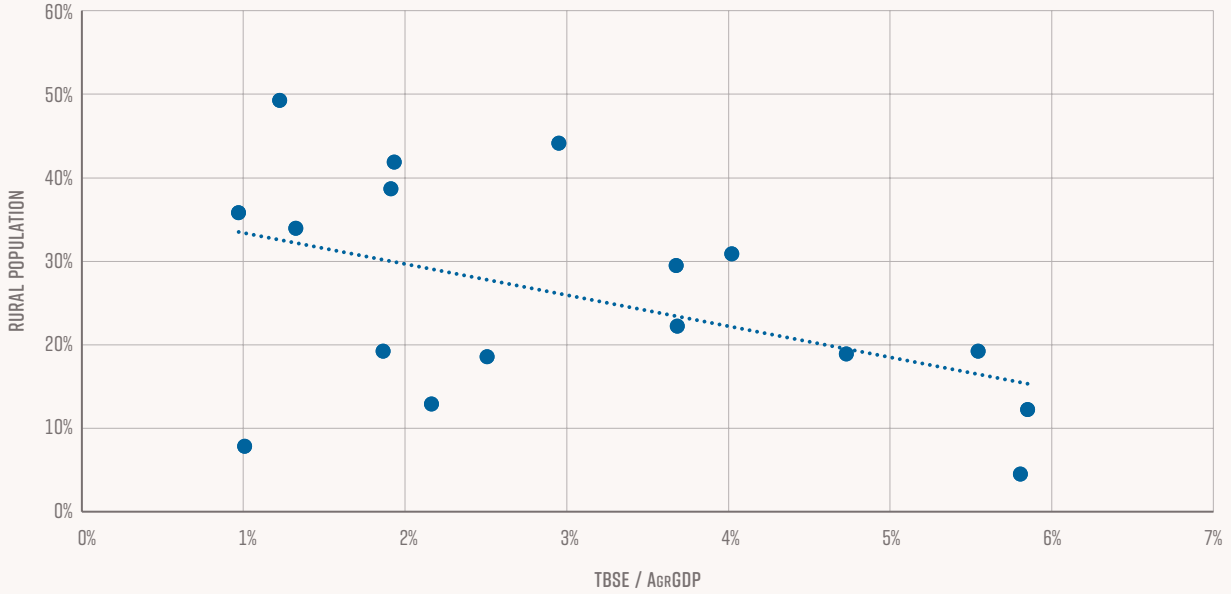
FIGURE 17. SUPPORTS TO THE SECTOR, RURAL POPULATION, AND AGRICULTURAL EMPLOYMENT (WITHOUT OUTLIERS)

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

A) TOTAL SUPPORT AND RURAL POPULATION



B) PUBLIC AGRICULTURAL EXPENDITURE AND RURAL POPULATION



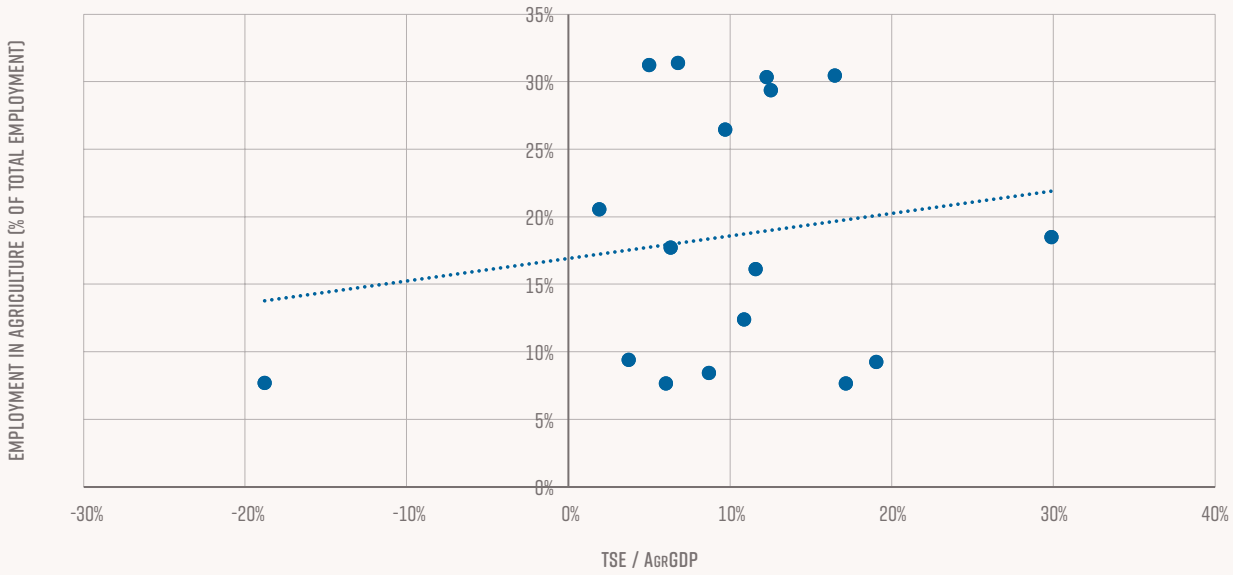
(Continued on next page)

Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

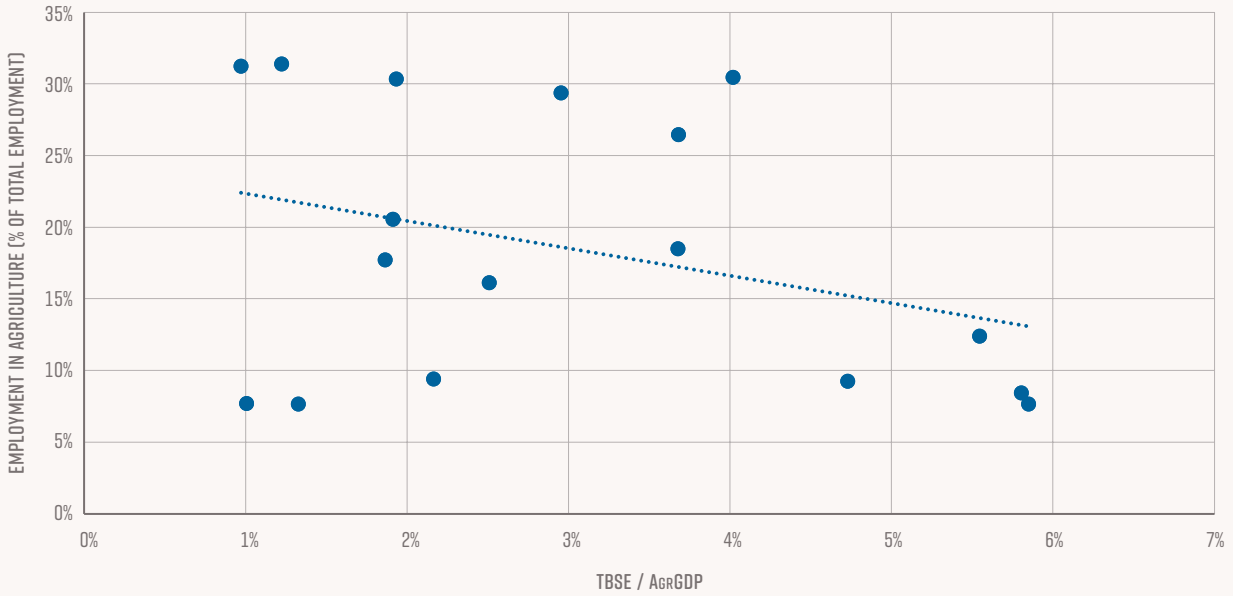
FIGURE 17. SUPPORTS TO THE SECTOR, RURAL POPULATION, AND AGRICULTURAL EMPLOYMENT (WITHOUT OUTLIERS)

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

C) TOTAL SUPPORT AND AGRICULTURAL EMPLOYMENT



D) PUBLIC AGRICULTURAL EXPENDITURE AND SECTOR EMPLOYMENT



Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

To further explore the relationship between support for the agricultural sector and its development, some key economic variables are analyzed. First, there is a possible negative correlation between total support and the level of net exports, also measured as a percentage of agricultural GDP **(Figure 18).** This does not imply a causal relationship: a high level of net exports could lead to a reduced level of support for the sector, or vice versa. This negative correlation exists regardless of whether support is provided through public spending, prices, or a combination of both instruments. Swinnen et al. (2016) show that, across a wide range of countries, the share of price-distorting measures in total transfers to the sector correlates negatively with exports. At the same time, other studies (Beckman and Countryman 2021, Tokarick 2003) demonstrate that reducing and/or eliminating producer support, particularly through market prices, would lead to an increase in trade value, as shown by the correlation in **Figure 18.**

FIGURE 18. RELATIONSHIP BETWEEN TOTAL SUPPORT TO THE SECTOR AND NET EXPORTS

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)

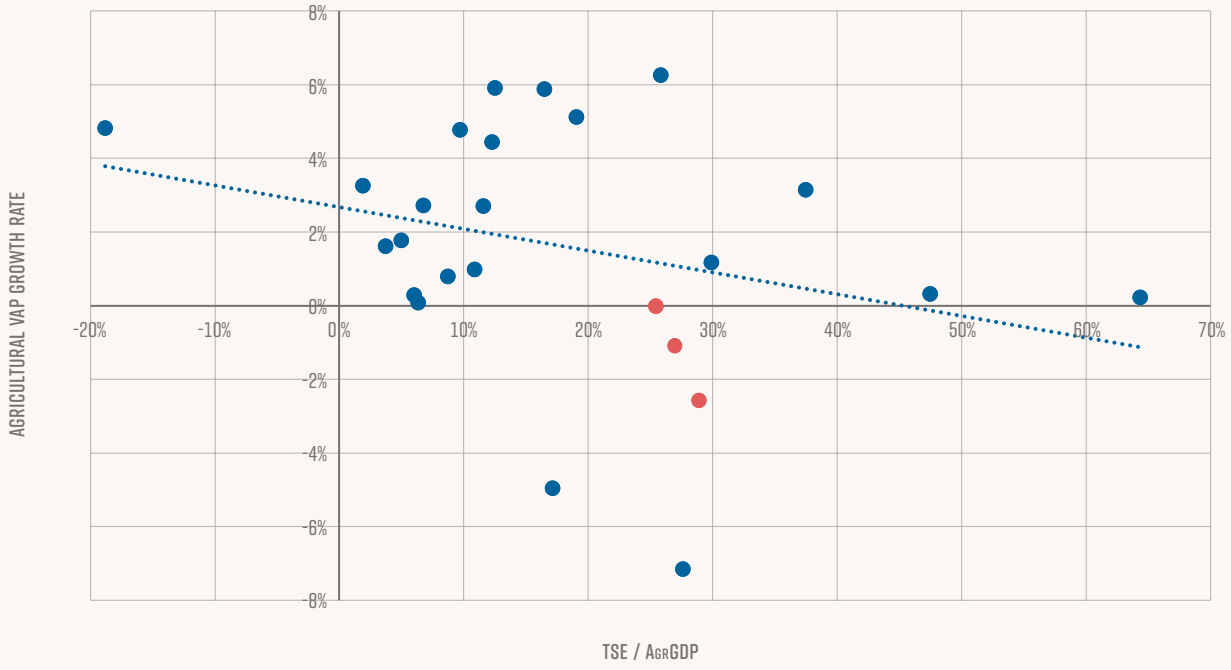
Note: Only in the case of Canada is the period used different (2017 to 2019) due to the absence of more recent agricultural GDP data. The negative correlation remains even when excluding the outliers (Argentina, Bahamas, Barbados, Jamaica, and Panama).

Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

There also appears to be a negative correlation between support for the sector (total, at market prices, and through budget spending) and the real growth rate of value added from agricultural production **(Figure 19).** This means that countries with a rapidly growing agricultural sector provide less support to the sector, whether through prices, public spending, or a combination of both.

FIGURE 19. RELATIONSHIP BETWEEN TOTAL SUPPORT AND THE VARIATION IN AGRICULTURAL VALUE ADDED

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

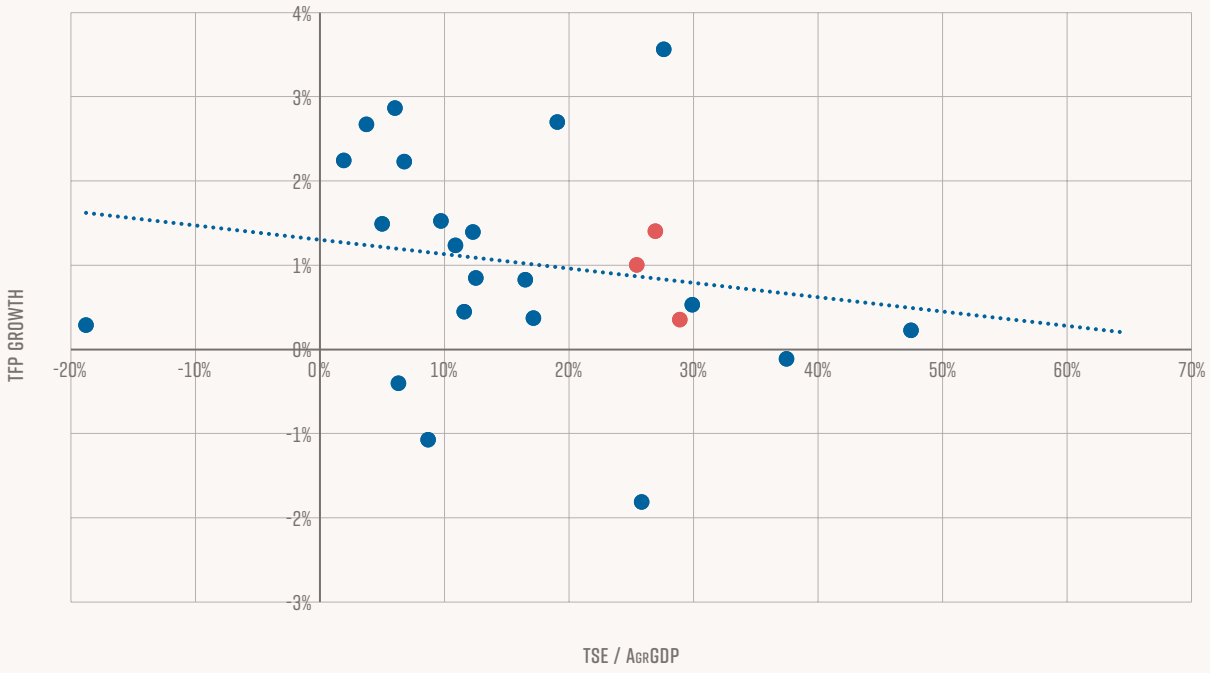
Another important association to analyze is the one that may exist between support for the sector and productivity, given that this support largely aims to increase productivity in order to enhance the profitability and competitiveness of the sector. The most relevant measure of productivity is total factor productivity, which includes all production factors (TFP). This measure is calculated as an index, and its point estimates can be volatile, so it is advisable to analyze it in terms of its long-term variation.

In this case, the average annual growth rate of the TFP index was taken between the year 2000 and the most recent year for which data is available from TSE, MPS, and TBSE in the Agrimonitor data-

base. Again, a negative correlation was found between the level of support for the sector and the growth of TFP **(Figure 20).** As will be seen in the next section, in general, countries with the lowest levels of support for the sector exhibit a declining trend over time. Thus, there are indications that a decrease in levels of support for the sector (and ultimately, the existence of relatively low levels) was accompanied by higher growth rates in TFP.

FIGURE 20. RELATIONSHIP BETWEEN TOTAL AGRICULTURAL SUPPORT AND THE VARIATION IN TOTAL FACTOR PRODUCTIVITY

(AVERAGE OF THE LAST THREE AVAILABLE YEARS)



Source: Own elaboration based on data from Agrimonitor and WDI (World Bank).

These correlations would suggest that those countries with a more dynamic agricultural sector have lower levels of total support as well as support via prices or public spending. On one hand, it could be that support creates dependency and provides few incentives for innovation, leading to a non-dynamic and unproductive sector; on the other hand, it could be that support for the sector responds to its needs, so that in countries where it is more dynamic, there is less need for support and, therefore, a lower level of effective support.

4. TRENDS IN AGRICULTURAL POLICIES

4.1. TRENDS IN SUPPORT ESTIMATES FOR THE SECTOR

To analyze trends in agricultural policies in the region, a first step is to examine, for each country and each of the support estimates discussed in the previous section, the trend over time.[24] The TSE as a percentage of agricultural GDP shows a downward trend in countries where total support to the sector is already

24. Annex 2 illustrates the general trends in support measures for the sector, along with detailed information by country and by support component.

low compared to the rest of LAC **(see Figure 8, panel b). Figure 21** shows that in five of the six such cases (Brazil, Colombia, Ecuador, Honduras, and Paraguay), the TSE measured in dollars presents a clear downward trend, regardless of what happens with agricultural GDP. A slight decline is also observed in the cases of Mexico (the other of the six countries) and Costa Rica, which could be mainly due to the growth of agricultural GDP. No clear pattern is observed in the opposite direction, with countries having relatively high levels of total support and increasing them.

FIGURE 21. EVOLUTION OF AGRICULTURAL GDP AND TSE, SELECTED COUNTRIES

(IN DOLLARS)

(Continued on next page)

Source: Own elaboration based on data from Agrimonitor.

FIGURE 21. EVOLUTION OF AGRICULTURAL GDP AND TSE, SELECTED COUNTRIES

(IN DOLLARS)

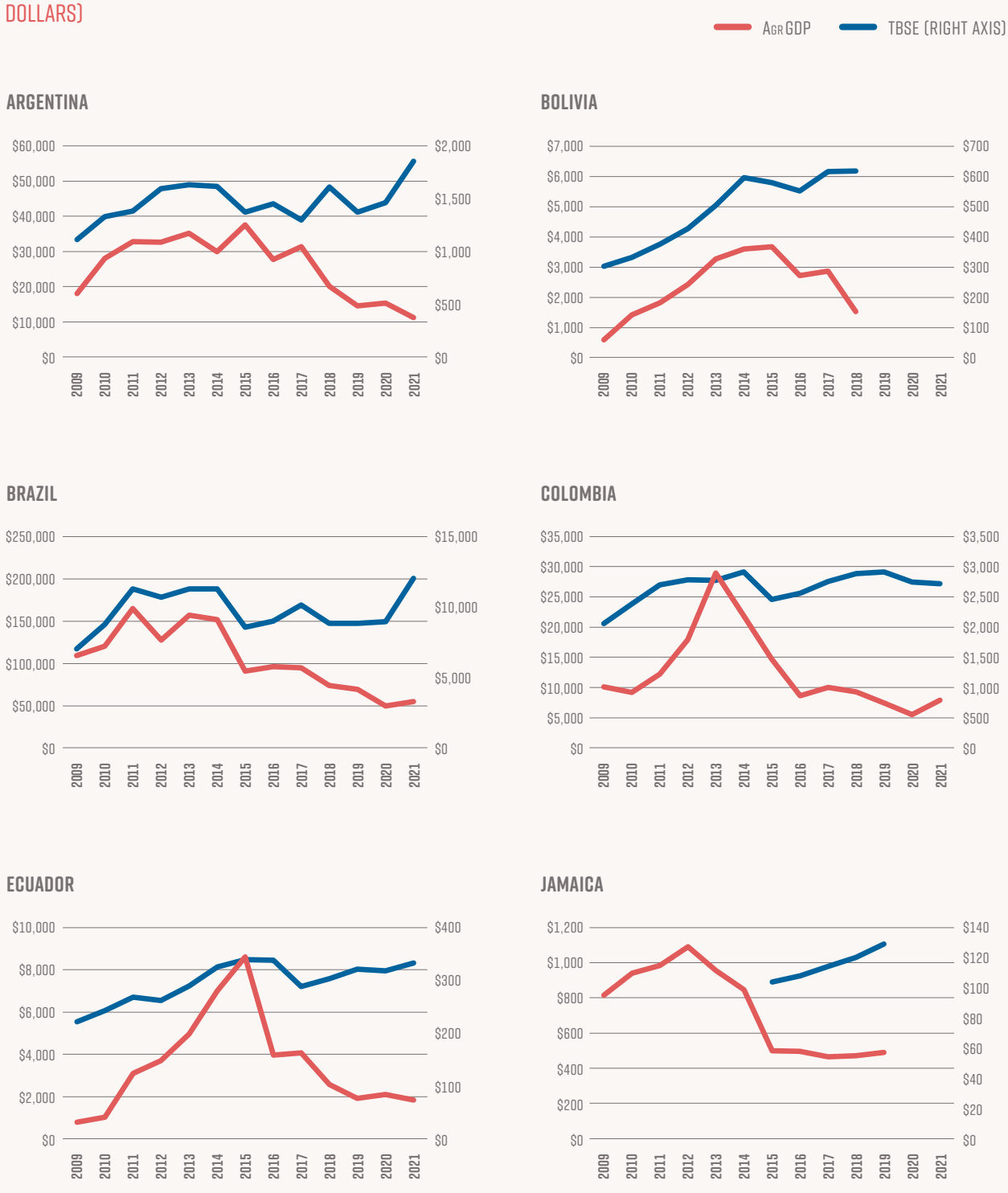
Source: Own elaboration based on data from Agrimonitor.

Focusing on public agricultural spending and market price support, it can be observed that among countries with relatively low levels of MPS (many of which also show low levels of TSE as a percentage of agricultural GDP), the trend is to maintain the level of support. Among countries with relatively high levels of MPS, on the other hand, there is a possible[25] trend towards increasing support **(Figure 22).**

25. It is considered a "possible" trend because, in several of those countries, the trends are not clearly defined, and the data is not as recent as in other cases.

FIGURE 22. EVOLUTION OF AGRICULTURAL GDP AND TBSE, SELECTED COUNTRIES

(IN DOLLARS)

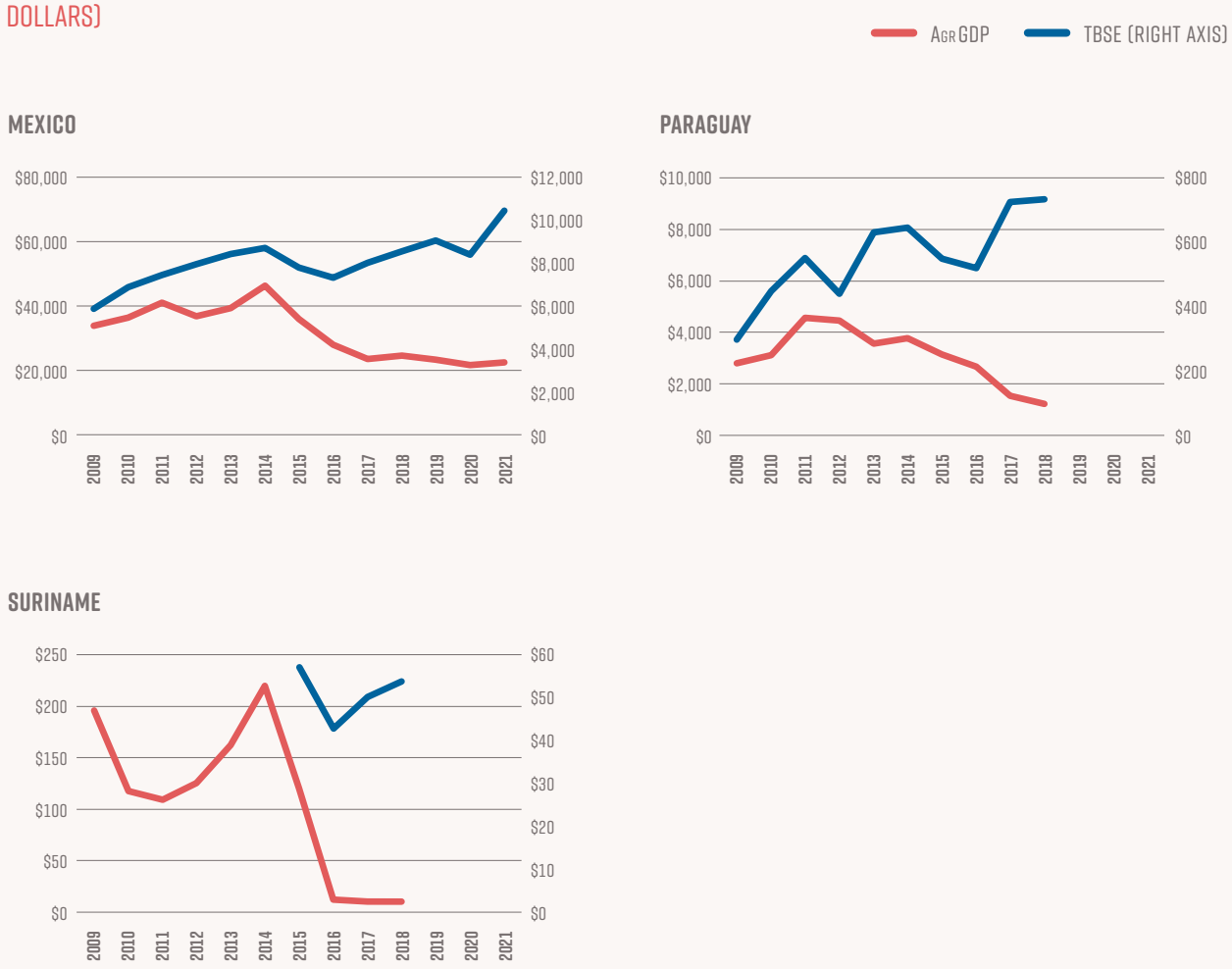


(Continued on next page)

Source: Own elaboration based on data from Agrimonitor.

FIGURE 22. EVOLUTION OF AGRICULTURAL GDP AND TBSE, SELECTED COUNTRIES

(IN DOLLARS)



Source: Own elaboration based on data from Agrimonitor.

If total support shows a downward trend and MPS remains stable, then budgetary public spending must be decreasing. **Figure 22** allows us to verify that the reduction is not due to an increase in agricultural GDP, but that in nominal terms there has been a significant drop in TBSE. As mentioned before, TBSE is made up of two elements: support through general services and budgetary payments to producers. The composition of TBSE between these two elements has not changed in roughly half of the countries. However, in 6 of the remaining 13 countries, there is an upward trend in GSSE as a percentage of TBSE,[26] and 4 of them (Honduras, Jamaica, Colombia, and Chile) are above the regional average in terms of that percentage. In general terms, there are no major changes in the composition of TBSE, although more countries are investing more in general services than those investing less.

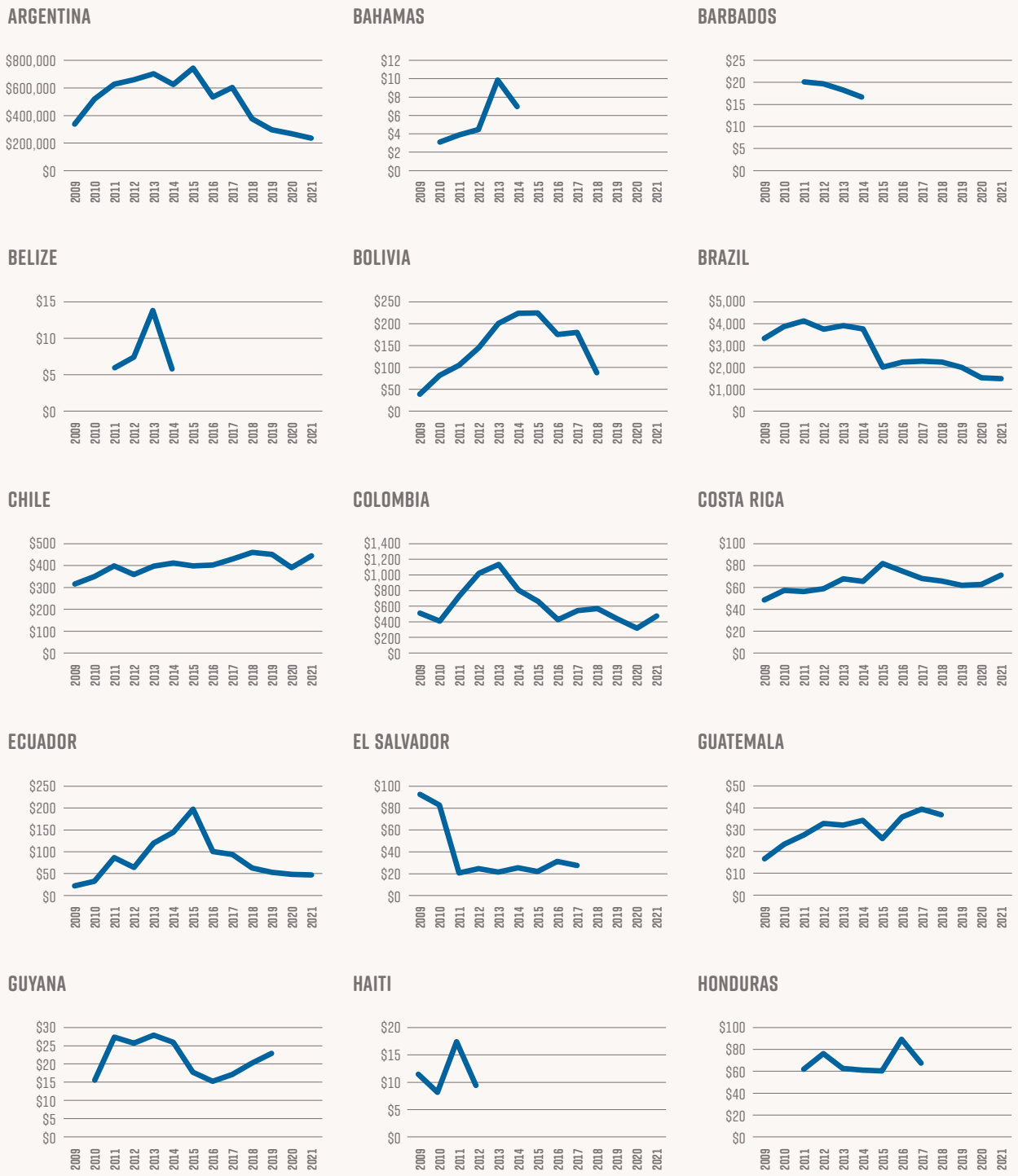
However, if we consider that TBSE (in absolute terms and as a percentage of agricultural GDP) has been decreasing in many cases, it follows that the same is happening with investment in general services. As shown in **Figure 23**, in nine countries (Argentina, Barbados, Bolivia, Brazil, Colombia, Ecuador, Mexico, Paraguay, and Suriname), there is a clear trend towards lower investment in general services, and in Uruguay, there has been stagnation or a slight decline since 2017. In El Salvador, Nicaragua, and Peru, GSSE shows an L-pattern: a slight increase in recent years after a significant drop. Only Chile, Guatemala, and Jamaica show a clear trend of increasing investment in general services (Trinidad and Tobago can be added, although the available data only covers the period from 2010 to 2015).

THE TBSE IS MADE UP OF TWO ELEMENTS: SUPPORT THROUGH GENERAL SERVICES AND BUDGETARY PAYMENTS TO PRODUCERS. THE COMPOSITION OF THE TBSE BETWEEN THESE TWO ELEMENTS HAS NOT CHANGED IN APPROXIMATELY HALF OF THE COUNTRIES

26. Of the remaining seven countries, five do not show a clear trend, and only two (Bahamas and Panama) show a decline in GSSE as a percentage of TBSE.

FIGURE 23. EVOLUTION OF ESTIMATED SUPPORT FOR GENERAL SERVICES BY COUNTRY

(IN MILLIONS OF CURRENT DOLLARS)

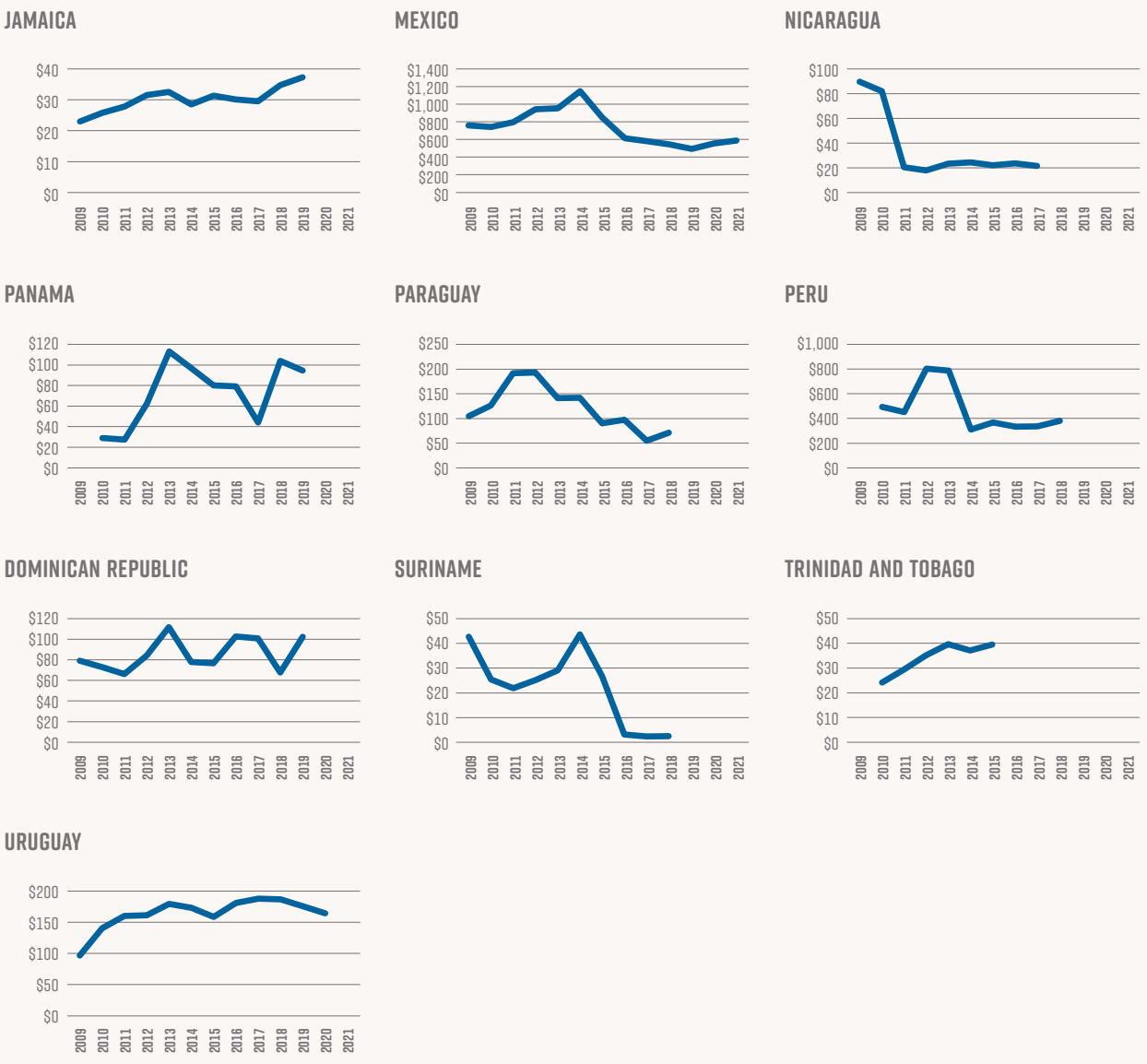


(Continued on next page)

Source: Own elaboration based on data from Agrimonitor.

FIGURE 23. EVOLUTION OF ESTIMATED SUPPORT FOR GENERAL SERVICES BY COUNTRY

(IN MILLIONS OF CURRENT DOLLARS)



Source: Own elaboration based on data from Agrimonitor.

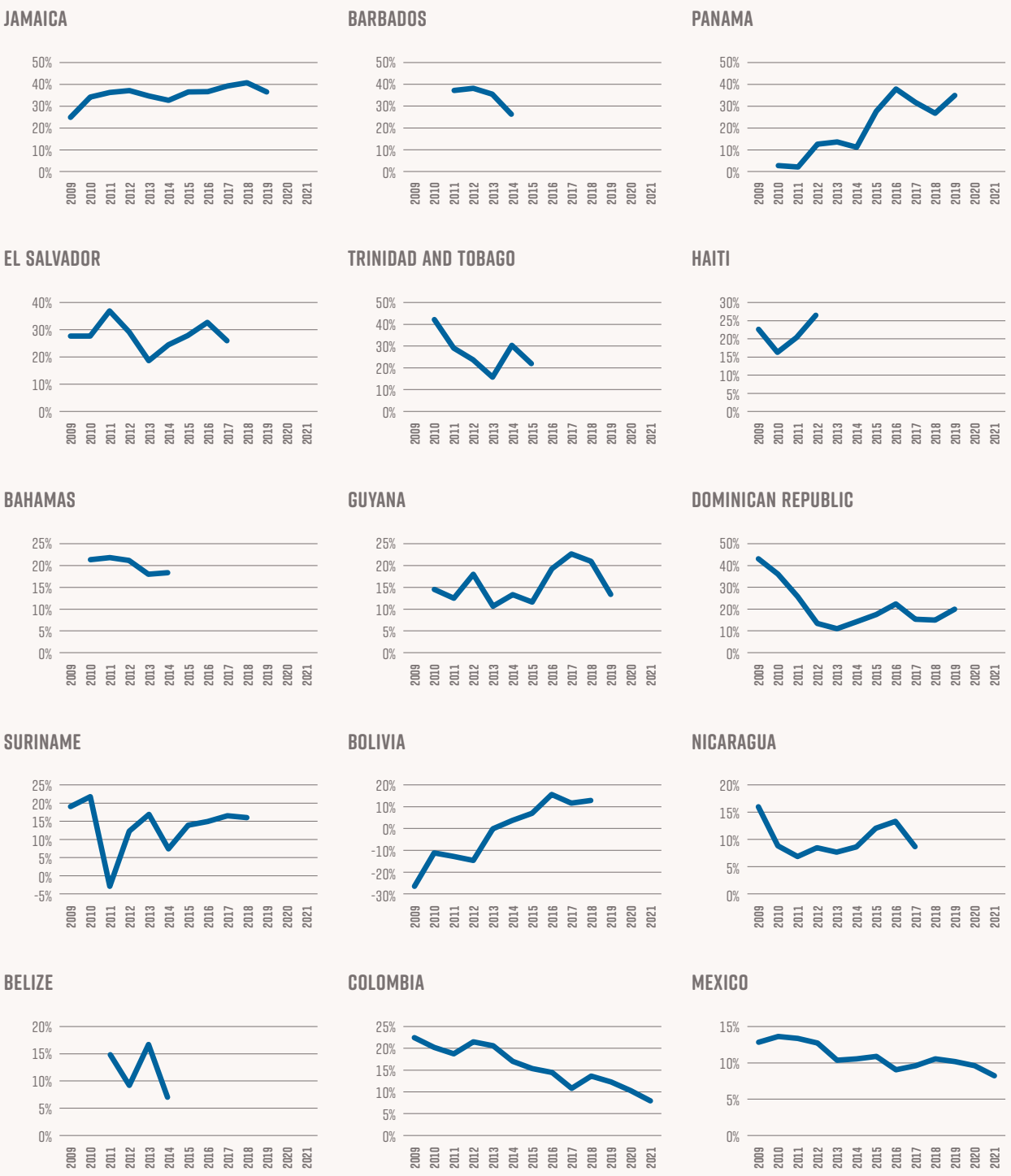
Another interesting variable to analyze is the proportion of agricultural producer support in relation to their income.[27] A pattern of divergence is observed among countries in the region: those where PSE represents a higher-than-average percentage of producers' income tend to increase it[28]; conversely, in those where the percentage of PSE is low, the trend is to reduce it even further.

Countries with relatively low levels in some support estimates for the sector show a decreasing trend, and vice versa. If these trends continue, the differences between countries in terms of their levels of support for the sector will continue to widen. Colombia, Honduras, Ecuador, Paraguay, Brazil, Mexico, and even Chile and Costa Rica, which already have low levels of support for the sector (as a percentage of their agricultural GDP), will have even lower levels. The opposite will happen in the case of Bolivia, the Dominican Republic, El Salvador, and Panama, which already have relatively high levels of support (by Latin American standards, not necessarily compared to the EU, the United States, or Canada). Nicaragua, Peru, Uruguay, and Argentina are the exceptions, as they have low support levels but show increasing trends. Argentina is an exceptional case even among these four countries, as it is the only country in the region whose total support for the sector is negative, although the data indicates that this negative support is decreasing.

27. This variable is less related to the previous ones because it depends solely on the PSE and the income level of agricultural producers, which is not directly linked to the proportion that the PSE represents of the TSE.

28. The exceptions are the Bahamas, Barbados, and Trinidad and Tobago (along with Haiti and Guyana, for which no clear trend can be observed), but since their data is outdated, it cannot be confirmed that their trends are still current.

FIGURE 24. EVOLUTION OF ESTIMATED PRODUCER SUPPORT AS A PERCENTAGE OF THEIR INCOME, BY COUNTRY



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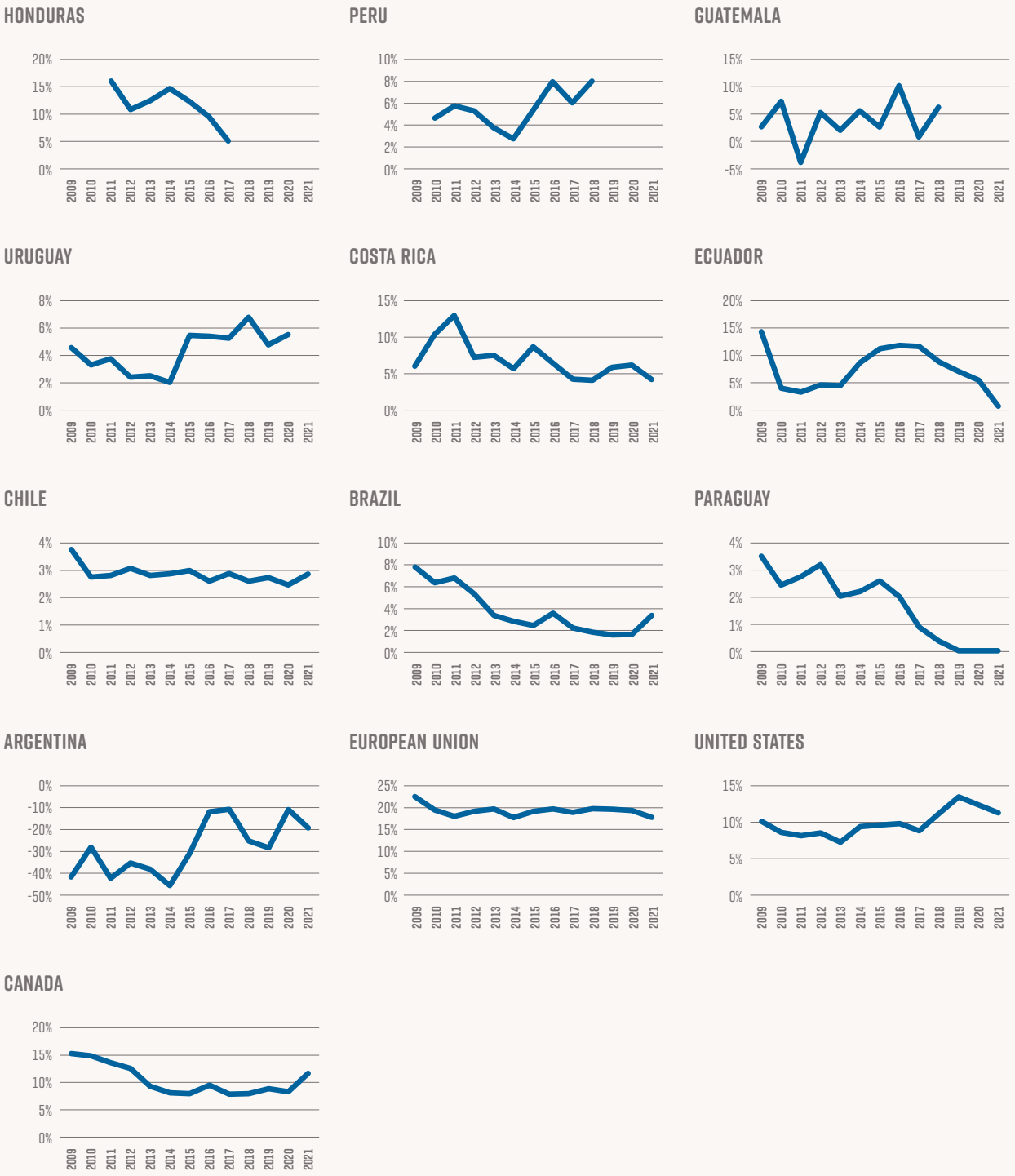
Countries are sorted by the average of the last three available years, from highest to lowest (as shown in Figure 13). The red line indicates the average position for LAC.
Source: Own elaboration based on data from Agrimonitor.

FIGURE 24. EVOLUTION OF ESTIMATED PRODUCER SUPPORT AS A PERCENTAGE OF THEIR INCOME, BY COUNTRY



Countries are sorted by the average of the last three available years, from highest to lowest (as shown in Figure 13). The red line indicates the average position for LAC.
Source: Own elaboration based on data from Agrimonitor.

4.2. BRIEF ANALYSIS OF AGRICULTURAL POLICIES IMPLEMENTED IN THE COUNTRIES OF THE REGION

In addition to trends in support levels, it is also relevant to analyze whether there are other qualitative trends, in terms of specific objectives and instruments used. **A recent study concludes that LAC lacks the necessary set of support policies "to address the challenges and take advantage of the opportunities"** (Trevelli and Berdegué 2019, 49). What common patterns exist and how are these policies changing? Without attempting an exhaustive review, the following section outlines some of the policies being implemented in different countries, which aim at productivity, food security, and environmental sustainability. Recent country-level studies highlight the diversity of the region, but also reveal certain similarities.[29]

In terms of the institutional framework that creates and implements support policies for the agricultural sector, several countries in the region (such as Colombia, Guyana, Mexico, and Suriname) have recently experienced significant budget cuts in the institutions responsible for these policies, which is reflected in the observed reductions in budgetary support levels. Beyond financial resources, the organization of the institutional framework and its alignment with the specific challenges of the sector are also important. In this regard, a comparative study for several Central American countries and the Dominican Republic (Flores et al., 2020) finds that there is a persistent lack of coordination among public institutions in the sector, leading to inefficient use of resources and preventing the implementation of a long-term vision and policy. However, **some countries have implemented significant changes in their institutional structure to better address the specific needs of their agricultural and fisheries sectors.** The effects of these efforts remain to be seen.

29. To avoid repeated references to multiple documents, it is clarified in this note that the remainder of section 4 is based on the information contained in Agüero García et al. (2020), Flores et al. (2020 and 2023), Gachot et al. (2021 and 2022), Lema et al. (2022), OECD (2022), and Vandorpe et al. (2020).

- **ECUADOR:** In 2017, Ecuador recognized the growing importance of the fisheries sector (see section 6) by separating fisheries policy from agricultural and livestock policy through the creation of the Ministry of Aquaculture and Fisheries. This Ministry later became part of the Ministry of Production, Foreign Trade, and Investments.

- **JAMAICA:** Between 2016 and 2017, Jamaica made a similar change. Without separating agriculture from fisheries, it merged the Ministry of Agriculture and Fisheries with the Ministry of Industry, Investment, and Commerce into a single entity: the Ministry of Industry, Commerce, Agriculture, and Fisheries. The goal was to better address several interrelated constraints that were inhibiting private investment in the agricultural and fisheries sector.

- **BOLIVIA:** As discussed later, a decentralized body was created to manage, implement, and execute programs and projects related to sovereignty and food security.

In terms of objectives, **policies aimed at increasing productivity, income, and competitiveness predominate.** Often, there is an emphasis on supporting certain types of producers (particularly family or small-scale producers), and programs exclusively dedicated to serving these populations are sometimes implemented. In some countries, this emphasis is more pronounced:

- **CHILE:** It allocates a limited amount of resources for producer support, but the majority of these resources are directed toward small-scale producers.

- **BRAZIL:** The focus on small producers has been increasing since the mid-2000s, with particular emphasis on the poorer regions of the country that produce basic food products.

- **PERU:** The 2014 National Agricultural Policy explicitly prioritized increasing the income of family farming (crops), which resonated in subsequent policy strategies.

- **ARGENTINA:** In November 2020, the government approved a mechanism to compensate small and medium-sized producers (with land of up to 400 hectares) for a fraction of the export taxes on soybeans. Payments are higher for smaller producers and for those outside the provinces of Buenos Aires, Córdoba, Entre Ríos, and Santa Fe.

- **MEXICO:** With the change of federal administration in 2018, agricultural policy shifted to focus on small and medium-sized producers in the country's poorest areas. The Proagro Productivo program was replaced by the new Producción para el Bienestar program, which provides cash transfers to small producers (with up to 20 hectares) of corn, beans, wheat, rice, and other grains (USDA-FAS, 2019a). A program was also launched to increase the availability of fertilizers and improve the productivity of small producers in marginalized areas, with a budget increase of 172% in 2022 (USDA-FAS, 2021a).

- **COSTA RICA:** The food price crisis of 2007-2008 raised concerns about the food security of the population and prompted the development of extension programs to increase the productivity of small producers of basic foods.

Another common objective of agricultural policies in the region is **to ensure food security for the population.** In Central America and the Dominican Republic, for example, this is one of the most frequently encountered public policy objectives. Here are two other relevant cases:

- **MEXICO:** In 2019, the government merged two state entities responsible for selling basic food products at subsidized prices and continued this policy. It also launched a subsidized milk distribution program for households below the welfare line (USDA-FAS, 2019b) and in June 2020 initiated a communication campaign called "La Nueva Mesa" to encourage the population to improve their eating habits by promoting the consumption of unprocessed, domestically sourced products (USDA-FAS, 2020c).

- **BOLIVIA:** Between 2006 and 2018, agricultural policies operated around three main objectives: increasing production, developing productivity, and ensuring food security. The food price crisis heightened interest in the latter objective to such an extent that in 2014 the Decentralized Public Institution for Food Sovereignty was created to "manage, implement, and execute programs and projects for food sovereignty and security, prioritizing small and medium-sized producers, as well as family and community agriculture"[30].

30. Supreme Decree No. 1858, Article 2, January 8, 2014.

A growing policy objective for the sector is **to increase environmental sustainability,** particularly reflected in the following countries:

- **BRAZIL:** In 2010, Brazil launched the ABC Plan (Sectoral Plan for Adaptation to Climate Change and Low Carbon Emissions in Agriculture) with various goals aimed at 2020 regarding soil recovery, the adoption of direct seeding, and adaptation to climate change. The program, which consists of a subsidized credit line, exceeded its per-hectare goals by 52%[31] and carbon emission reduction goals by 19% (MAP, 2023). It was renewed for another ten years with targets seven times more ambitious in terms of GHG emissions reduction and twice as ambitious in terms of land area, with a 100% budget increase between 2020 and 2021.

- **MEXICO:** Recently, Mexico has begun a process to phase out glyphosate and genetically modified corn. In addition, in 2019, it launched the "Sembrando Vida" program, focused on small producers in high-biodiversity regions and marginalized areas, aiming to generate employment and promote food self-sufficiency and reforestation.[32] The program provides cash transfers to producers who plant timber, fruit, and spice species on deforested parcels and who are responsible for planting, caring for, and harvesting these crops. Additionally, the government announced a strategy to reduce agricultural land burning and launched the National Soil Strategy for Sustainable Agriculture in 2022, aiming to conserve, restore, and promote soil management.

- **CENTRAL AMERICAN COUNTRIES:** Such as Nicaragua, Panama, and the Dominican Republic have implemented various programs aimed at reducing the sector's vulnerability to climate change, preserving forests, and promoting the appropriate use of water, fertilizers, pesticides, and other inputs.

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31. By the end of 2018, the program had exceeded its goals for the extension of integrated systems, direct seeding, and animal waste treatment, but it fell significantly short regarding the goals for rehabilitating degraded pastures and reforestation (USDA-FAS 2021b).

32. According to a press release from the World Resources Institute, an analysis of forest cover loss from this organization warns that "the program may have had a negative impact on forest cover and the country's carbon mitigation targets during its first year of implementation," although "the analysis is inconclusive due to a lack of access to information and coordinates of the beneficiary plots" (see Press Release at: es.wri.org/noticias/boletin-de-prensa-analizan-impactos-forestales-y-potencial-de-mitigacion-de-sembrando-vida).

- **COLOMBIA:** The agricultural public budget increased by 66% between 2020 and 2021, which boosted funding for programs focused on production management, health, climate initiatives, institutional capacity, and innovation and development.

The effectiveness of these policies aimed at environmental sustainability is, in many cases, an open question. The following section seeks to contribute, at least partially, to the discussion by analyzing the relationship between agricultural policies and GHG emissions.

5. THE EFFECTS OF AGRICULTURAL POLICIES AND GREENHOUSE GAS EMISSIONS

Agro-food systems emit GHGs in multiple ways. A useful way to categorize these emissions is the one used by the FAO, which details three groups according to their source:

1. **GHGs from the farm:** Emissions from primary production, including crops, enteric fermentation, manure from animal production, fertilizer use, and non-electric energy consumption on the farm.

2. **GHGs from land-use change:** Emissions from the conversion of forests to agricultural land, from burning, and from carbon capture in forested areas.

3. **GHGs from pre- and post-production of food:** Emissions resulting from the production of fertilizers, the use of electrical energy on the farm, food processing and packaging, transportation, household consumption, and waste management and food loss.

Table 6 presents the GHG emissions from these three groups for countries in LAC and for the world as a whole. Emissions from primary production closely relate to the relative size of the agricultural GDP of the countries. For instance, Brazil emits 48% of the GHGs produced on farms, and its agricultural GDP represents 48.5% of the total for LAC; Argentina emits 13.5%, and its agricultural GDP accounts for 14.5% of the total. Overall, the correlation between contributions to agricultural GDP and GHG emissions from farms for the 26 countries is 99.5%.

TABLE 6. GHG EMISSIONS FROM AGRI-FOOD SYSTEMS IN LAC (AVERAGE 2018-2020, IN THOUSANDS OF TONS OF CARBON DIOXIDE EQUIVALENT E –CO_2EQ–, ASSESSMENT REPORT 5, AR5)

	ON FARM		LAND USE CHANGE		PRE- AND POST-PRODUCTION		TOTAL AGRI-FOOD SYSTEMS		
COUNTRY	KT CO_2EQ	% LAC	KT CO_2EQ	% LAC	KT CO_2EQ	% LAC	KT CO_2EQ	% LAC	% WORLD
BRAZIL	552,286	48%	665,990	57%	166,731	34%	1,385,008	49.3%	8.6%
ARGENTINA	115,694	14%	54,964	5%	49,454	10%	260,112	9.3%	1.6%
MEXICO	112,033	10%	15,362	1%	108,376	22%	235,771	8.4%	1.5%
COLOMBIA	72,475	6%	83,029	7%	32,019	6%	187,523	6.7%	1.2%
PERU	27,967	2%	93,017	8%	16,376	3%	137,360	4.9%	0.9%
BOLIVIA	30,773	3%	75,073	6%	7,896	2%	113,741	4.1%	0.7%
VENEZUELA	42,337	4%	40,365	3%	16,736	3%	99,439	3.5%	0.6%
PARAGUAY	32,741	3%	48,197	4%	3,134	1%	84,071	3.0%	0.5%
ECUADOR	13,743	1%	26,044	2%	10,733	2%	50,521	1.8%	0.3%
NICARAGUA	12,005	1%	20,573	2%	2,940	1%	35,518	1.3%	0.2%
CHILE	13,177	1%	-	0%	19,085	4%	32,262	1.1%	0.2%
URUGUAY	28,297	2%	-	0%	2,531	1%	30,828	1.1%	0.2%
GUATEMALA	11,080	1%	4,566	0%	6,199	1%	21,846	0.1%	0.1%
DOMINICAN REP.	10,044	1%	604	0%	10,539	2%	21,187	0.1%	0.1%
TRINIDAD AND TOBAGO	358	0%	83	0%	17,448	4%	17,889	0.1%	0.1%
HONDURAS	7,424	1%	5,974	1%	4,132	1%	17,531	0.1%	0.1%
GUYANA	5,793	1%	9,774	1%	543	0%	16,110	0.1%	0.1%
PANAMA	4,336	0%	3,834	0%	3,919	1%	12,090	0.0%	0.1%
HAITI	4,633	0%	624	0%	6,528	1%	11,815	0.0%	0.1%
SURINAME	2,277	0%	8,578	1%	354	0%	10,581	0.0%	0.1%
COSTA RICA	4,633	0%	35	0%	2,901	1%	7,568	0.0%	0.0%
EL SALVADOR	2,277	0%	1,147	0%	3,131	1%	6,555	0.0%	0.0%
BELIZE	603	0%	5,138	0%	352	0%	8,093	0.0%	0.0%
JAMAICA	2,820	0%	-	0%	2,302	0%	5,122	0.0%	0.0%
BAHAMAS	128	0%	17	0%	642	0%	788	0.0%	0.0%
BARBADOS	64	0%	-	0%	437	0%	501	0.0%	0.0%
LAC (% OF THE WORL)	1,149,401	16%	1,162,987	35%	495,439	9%	2,807,827	17%	

Note: kt CO_2eq indicates thousands of tons of CO_2 equivalent.
Source: Own elaboration based on FAOSTAT data.

Compared to the rest of the world, agricultural production in the region emits relatively more GHGs: while it accounts for 12.7% of global agricultural production, farm emissions concentrate 16% of the total. The situation is even more imbalanced when including emissions from land-use change; in this case, LAC emits 35% of the total. When combining the two categories (on-farm emissions and land-use change emissions, both direct and indirect results of primary production), LAC accounts for 22% of global emissions, compared to a contribution of 12.5% to agricultural production.

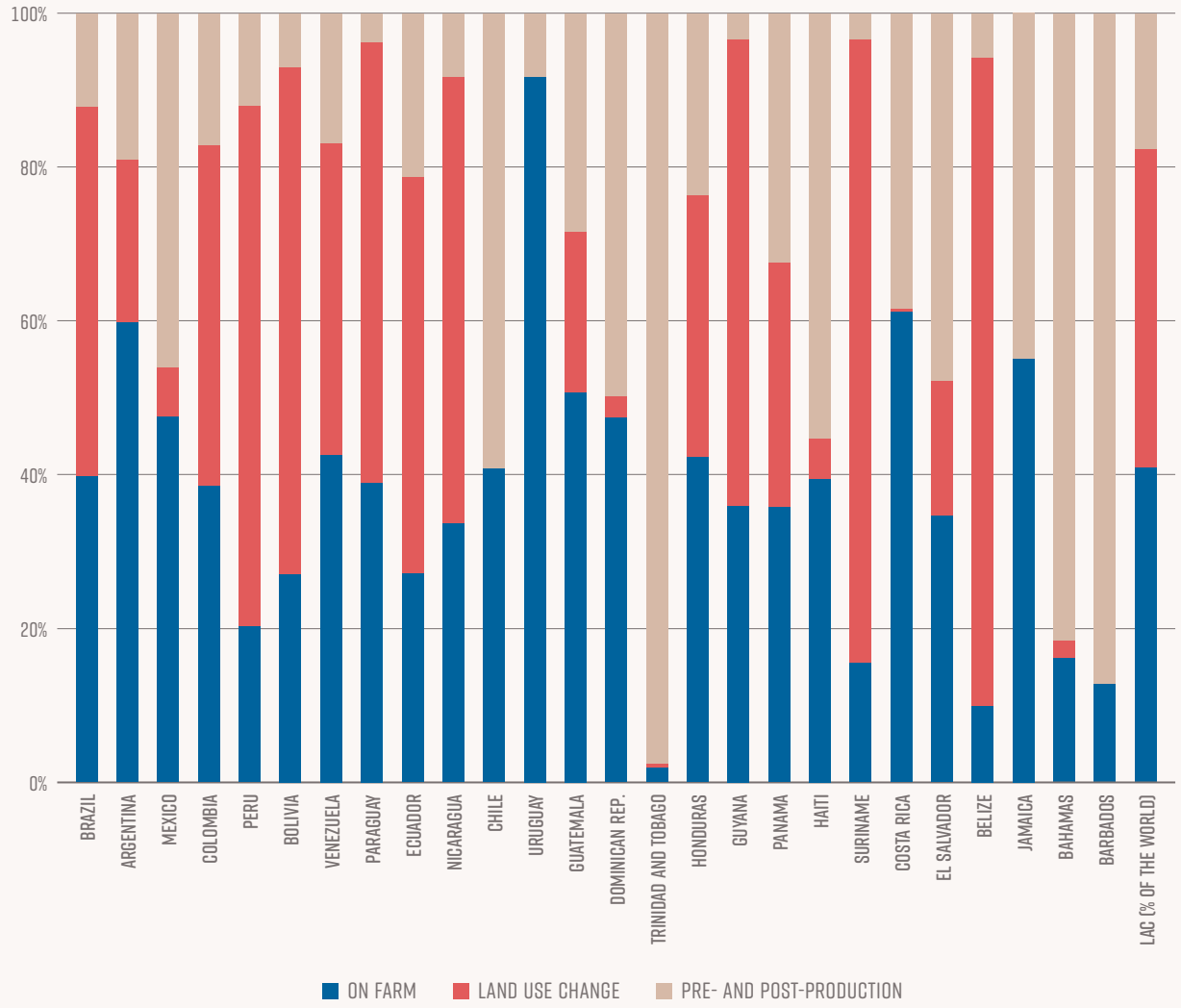
Brazil stands out as the country that contributes the most to GHG emissions resulting from land-use change (57% of the regional total and 20% globally); however, in relative terms, it does not generate the highest emissions from this concept. As shown in **Figure 25,** the eight countries sharing the Amazon rainforest have a high proportion of GHG emissions from land-use change. Among them, Brazil emits 48% of its agro-food system's total from this source; the countries with a higher proportion include Suriname (81%), Peru (68%), Bolivia (66%), Guyana (61%), and Ecuador (52%). Colombia and Venezuela have levels of 44% and 41%, respectively. Other countries with high proportions are Belize (84%, the highest percentage in LAC), Nicaragua (58%), and Paraguay (57%). In countries with low industrial development, the agricultural sector contributes a greater share to total GHG emissions than in countries with more developed industries, even if the agricultural sector in the former emits less GHG per unit of product.

Other countries that stand out include Uruguay, where nearly 92% of GHG emissions come from farms, and Trinidad and Tobago, Barbados, and the Bahamas, where the vast majority of GHG emissions from their agro-food systems come from pre- and post-production (98%, 88%, and 82%, respectively). In the cases of the Bahamas and Barbados, just over 40% of those emissions come from waste management and food loss, while in Trinidad and Tobago, nearly 85% of those emissions arise from fertilizer manufacturing.

BRAZIL STANDS OUT AS THE COUNTRY THAT CONTRIBUTES THE MOST TO GHG EMISSIONS RESULTING FROM LAND-USE CHANGE (57% OF THE REGIONAL TOTAL AND 20% GLOBALLY); HOWEVER, IN RELATIVE TERMS, IT DOES NOT GENERATE THE HIGHEST EMISSIONS

FIGURE 25. COMPOSITION OF GHG EMISSIONS FROM AGRI-FOOD SYSTEMS IN LAC

(AVERAGE 2018-2020)



Note: Countries are ordered from left to right according to the absolute level of GHG emissions from their agri-food system (from highest to lowest).

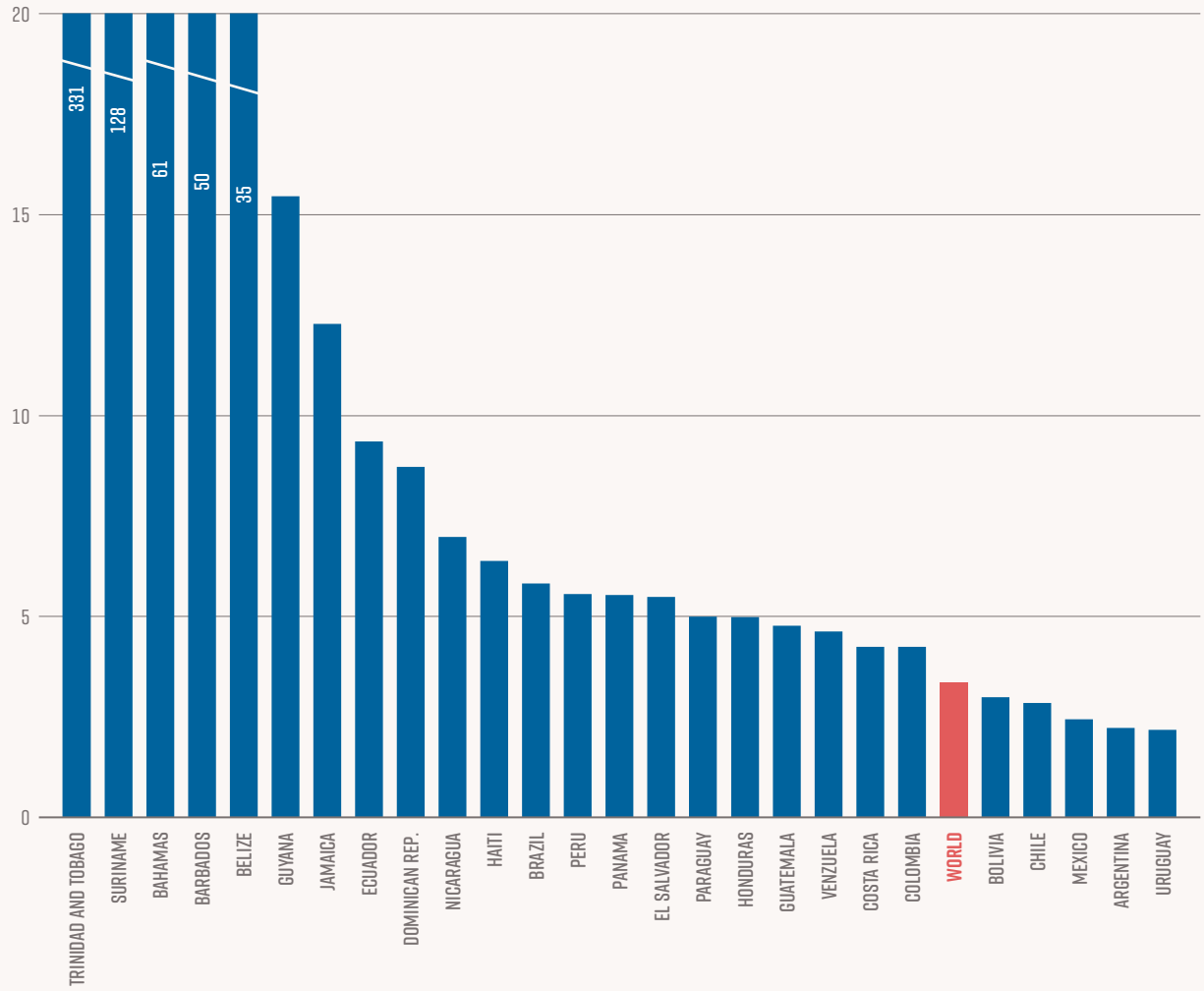
Source: Own elaboration based on FAOSTAT data.

The composition of the sources of GHG emissions provides insight into the differences in agricultural production systems among countries; however, it does not allow for a comparison of their environmental efficiency. A comparison of absolute emission levels also fails to do so, due to the differences in the size of the agricultural sector from one country to another. Comparisons should be made based on emissions intensity, measured either per unit of agricultural land or by the volumes or value of production.

Caribbean countries stand out from the rest due to their high levels of emissions per hectare **(Figure 26).** Logically, countries whose main source of GHG emissions is pre- and post-production of food have a smaller area of agricultural land; however, when the primary sources of emissions are on-farm production and land-use change, the size of agricultural land should not be a determining factor. In this case, the volume of emissions should be proportional to the area (assuming that agricultural production systems, including land-use change, are homogeneous).

FIGURE 26. GHG EMISSIONS FROM AGRI-FOOD SYSTEMS PER HECTARE

(IN TONS OF CO_2EQ PER HECTARE OF AGRICULTURAL LAND, AVERAGE 2018-2020)

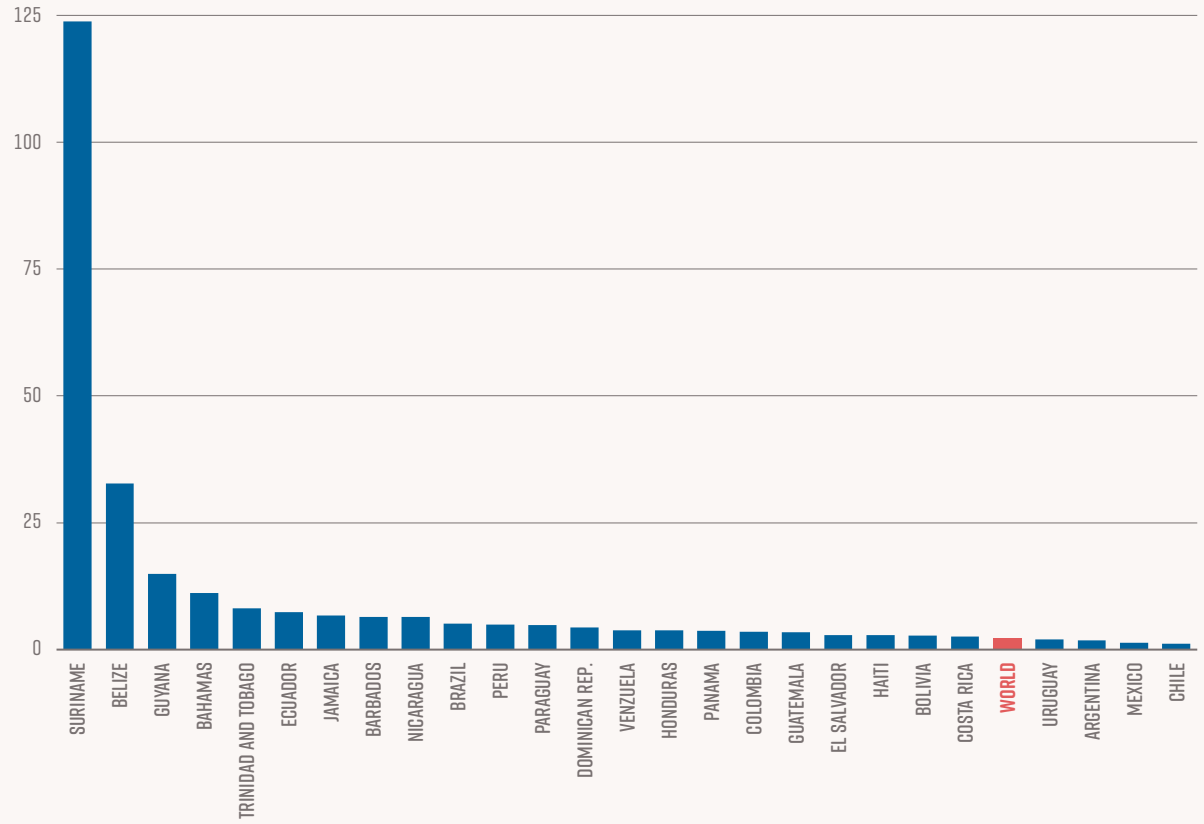


Source: Own elaboration based on FAOSTAT data.

Figure 27 presents the intensity of GHG emissions from on-farm production and land-use change per hectare of agricultural land. As shown, emissions are not proportional, and a higher intensity persists among Caribbean countries, particularly Suriname and Belize, where most GHG emissions from the agro-food system stem from land-use change.

FIGURE 27. GHG EMISSIONS FROM AGRICULTURAL PRODUCTION PER HECTARE

(TONS OF CO_2EQ PER HECTARE OF AGRICULTURAL LAND, AVERAGE 2018-2020)



Source: Own elaboration based on FAOSTAT data.

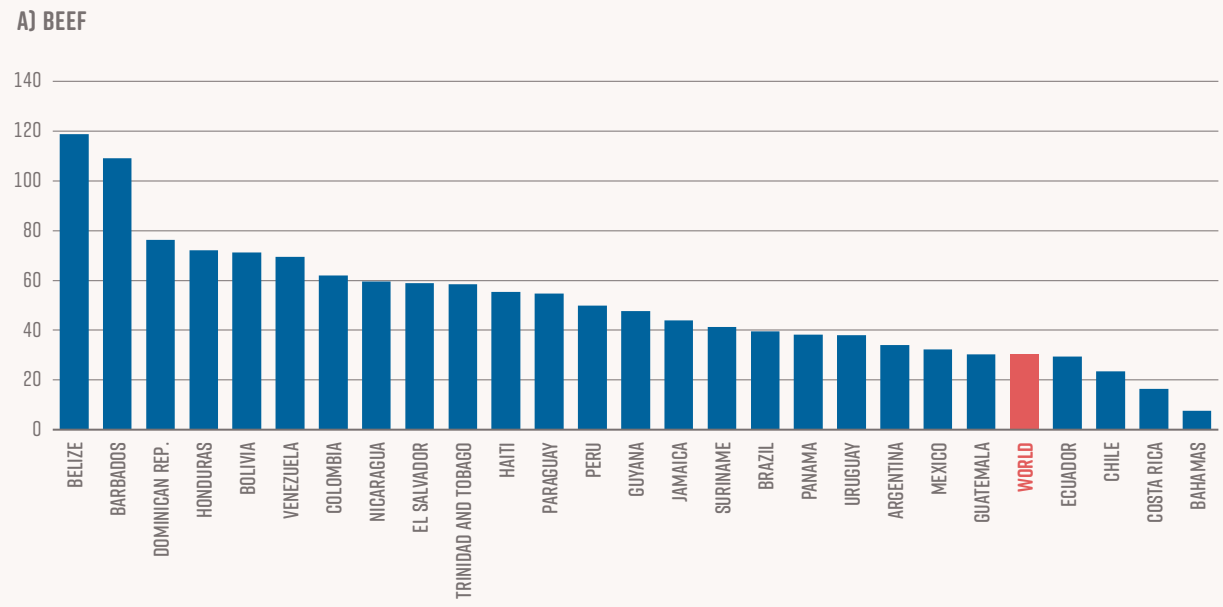
Figures 26 and 27 also highlight that most countries in LAC exhibit a higher emissions intensity than the global average, whether considering total emissions from agro-food systems or only those arising from on-farm production and land-use change. This indicates, in other words, that in the majority of countries in the region, agricultural production has a low carbon efficiency compared to the rest of the world.

Another way to measure the intensity of GHG emissions is based on production volume. **Figure 28** presents emissions per kilogram produced of beef, chicken, and pork, as well as per kilogram of rice and other cereals.[33] The emissions considered are only those directly involved in the production of these various products, excluding emissions from land-use change and pre- and post-production.

As seen in the Figure, the relative position of countries in terms of emissions intensity varies significantly between products, reflecting different comparative advantages. Caribbean countries are no longer the ones with the highest levels of carbon intensity, although several still show very high values in rice and other cereal production. However, in the case of beef, pork, and cereals other than rice, it is confirmed that production in LAC is more intensive in GHG emissions than the global average.

FIGURE 28. GHG EMISSIONS PER UNIT OF PRODUCTION

(KILOGRAMS OF CO_2EQ PER KILOGRAM OF PRODUCT, AVERAGE 2018-2020)

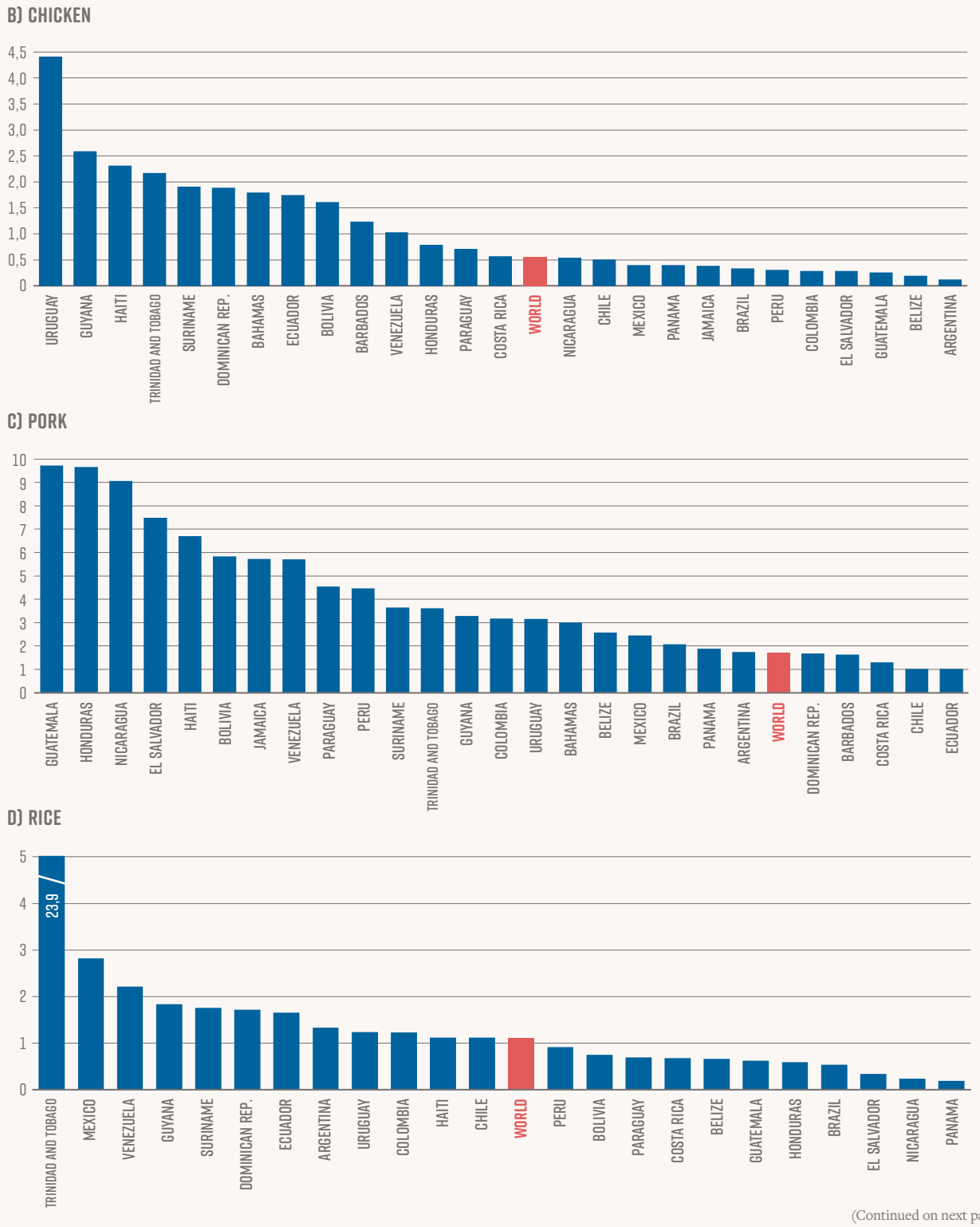


(Continued on next page)

33. The FAOSTAT database does not contain GHG emissions data for all products or product groups. In particular, it lacks information on emissions from the fruit and horticulture subsectors. Among the available items in the database, the following are not included: cow, goat, buffalo, sheep, or camel milk; buffalo, goat, or sheep meat; and eggs.

FIGURE 28. GHG EMISSIONS PER UNIT OF PRODUCTION

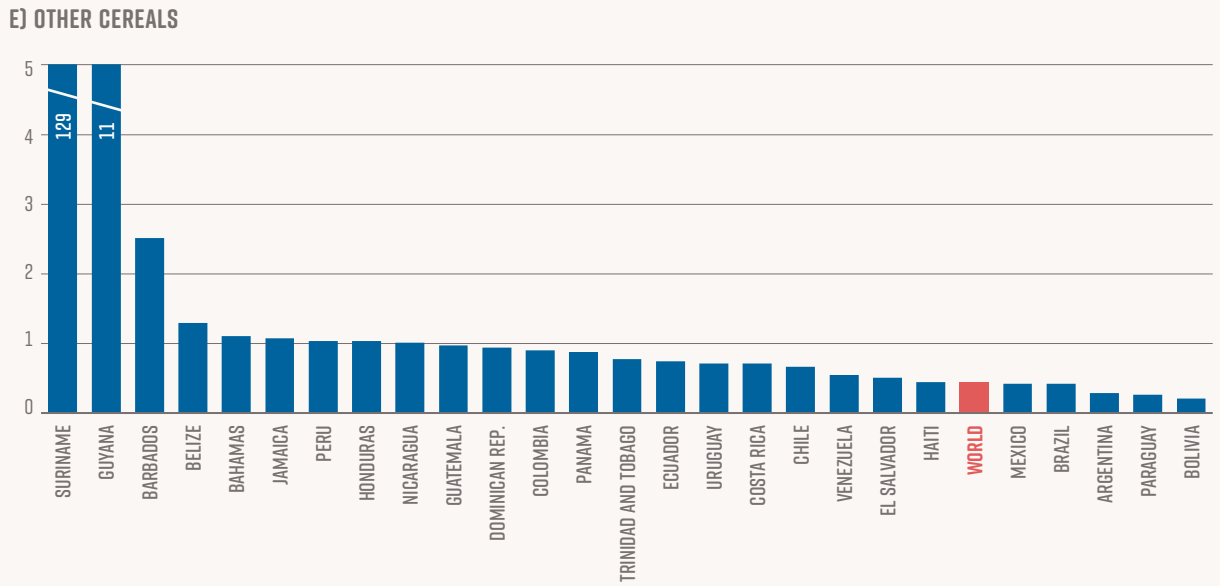
(KILOGRAMS OF CO_2EQ PER KILOGRAM OF PRODUCT, AVERAGE 2018-2020)



(Continued on next page)

FIGURE 28. GHG EMISSIONS PER UNIT OF PRODUCTION

(KILOGRAMS OF CO_2EQ PER KILOGRAM OF PRODUCT, AVERAGE 2018-2020)



Note: In the case of rice, Jamaica was excluded because its observations are very volatile, fluctuating between values of 26 (2010) and 6,671 (2019), and there is no information for the years 2018 and 2020. The average of the three most recent years (2016, 2017, and 2019) yields a value of 4,076, more than 3,688 times that of the global aggregate.

Source: Own elaboration based on FAOSTAT data.

The above suggests that there is significant potential to make agricultural production in LAC more carbon efficient. Agricultural policy can either encourage or discourage this change, for example, by providing more support to products with higher carbon efficiency or by promoting the adoption of technology in less efficient sectors. To verify whether this is currently happening, it is essential to compare the support directed towards specific products with their GHG emissions.

The Agrimonitor database includes GHG emissions data for some agricultural products in eight countries (Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, the Dominican Republic, and Suriname). It also provides emissions intensities, measured as the amount of GHG per ton of product and per hectare, as well as a percentage of the value of production. Additionally, it includes estimates of MPS and transfers to producers of individual products, enabling an analysis of whether there is a relationship between specific agricultural policies for these products and their GHG emissions.

To conduct this analysis, for each product in each country, the average of the last three available years was taken for (i) GHG emissions, (ii) GHG emissions per hectare (excluding those used for animal products), (iii) GHG emissions per ton of product, (iv) GHG emissions as a percentage of the value of production, (v) estimates of MPS, and (vi) estimates of transfers to producers of individual products.

Table 7 presents the correlation indices between the four measures of GHG emissions and the estimates of MPS and transfers to producers of individual products. As can be seen, the correlation indices are very low, and none are statistically significant for either MPS or transfers to producers of individual products. This means that agricultural trade policy in these countries takes a neutral stance regarding emissions: it does not incentivize products that generate the least GHG emissions (whether in absolute or relative terms) nor those that generate the most.

At the country level, different analyses yield mixed results. In the case of Ecuador, for example, Flores et al. (2023) conclude that "there is no direct correlation between the sectors responsible for the highest emission levels and those receiving the most public agricultural policy support" (84). In Uruguay, on the other hand, market price support policies are directed toward activities with lower GHG emission levels, rather than those that emit more; however, both types of activities receive direct support (García et al. 2022).

In Mexico, if sugar is excluded (which receives a high amount of transfers and emits a relatively low amount of GHG), there is a slight positive association between GHG emissions and transfers by individual product (see Lema et al. 2022, Table 11). A similar situation occurs in Jamaica: sugar and chicken meat production account for two-thirds of GHG emissions in the sector (18.06% and 48.71%, respectively) and receive nearly 78% of the transfers by individual product (8.6% and 69.35%) (see Gachot et al. 2021, Table 10).

THE AGRIMONITOR DATABASE INCLUDES THE GHG EMISSIONS OF CERTAIN AGRICULTURAL PRODUCTS IN EIGHT COUNTRIES (ECUADOR, EL SALVADOR, GUATEMALA, GUYANA, HONDURAS, JAMAICA, THE DOMINICAN REPUBLIC, AND SURINAME). ADDITIONALLY, IT INCLUDES THE INTENSITIES OF THESE EMISSIONS

TABLE 7. CORRELATION BETWEEN MARKET PRICE SUPPORTS, TRANSFERS TO PRODUCERS OF INDIVIDUAL PRODUCTS, AND GHG EMISSIONS

	MPS		PSCT	
	CORREL.	N	CORREL.	N
GHG EMISSIONS	-0.060 0.5893	83	-0.058 0.5968	85
GHG EMISSIONS PER HECTARE	-0.061 0.6626	53	-0.061 0.6621	54
GHG EMISSIONS PER TON	-0.066 0.5554	83	-0.068 0.5408	84
VALUE OF GHG EMISSIONS (% OF PRODUCTION VALUE)	-0.052 0.6353	84	-0.055 0.6140	86

Note: The p values are presented below the correlation coefficients in a smaller font size.
Source: Own elaboration based on data from Agrimonitor.

In Guyana, the opposite occurs: 77.7% of the transfers by individual product are directed to chicken meat (44.9%) and sugar (32.8%), which account for only 10.7% of the sector's GHG emissions (2.3% and 8.4%, respectively). Meanwhile, rice, responsible for 73.7% of emissions, receives only 8.4% of the transfers by individual product (see Gachot et al. 2022, Table 12). In Suriname, an inverse relationship between support levels and GHG emissions is also observed: rice, which emits 83% of the sector's GHG, faces negative transfers (and the highest in absolute value). In contrast, oranges, chicken meat, and coconuts, which receive 83.6% of transfers, are responsible for only 0.6% of emissions (see Vandorpe et al. 2020, Table 13).

In summary, **the results at the country level vary greatly and are sometimes completely opposed** (as in the cases of Jamaica and Guyana). This again demonstrates the high heterogeneity of LAC and illustrates why, at the regional level, it has not been possible to find a positive or negative correlation between the support granted by public agricultural policy and GHG emissions.

6. TRENDS IN FISHERIES POLICIES

6.1. ANALYSIS OF THE FISHERIES AND AQUACULTURE SECTOR IN THE REGION

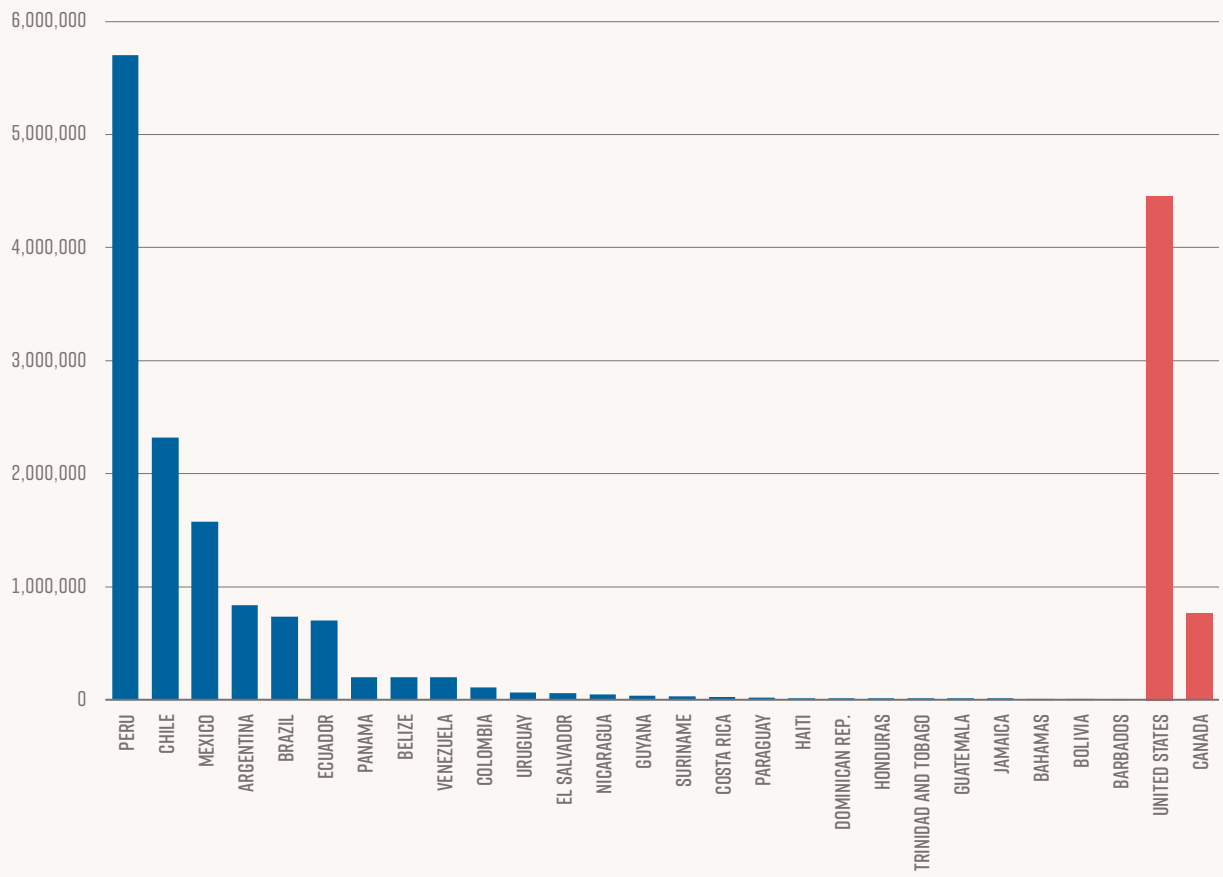
The fisheries and aquaculture sector is highly relevant for some countries in the region, though there is less available information for this sector. While the OECD's estimates of support for the agricultural sector include data since 1986, the corresponding data for the fisheries and aquaculture sector is available only from the year 2000, and for most countries only from 2007 onwards. In the Agrimonitor database, 13 out of the 25 included LAC countries provide information on support for the agricultural sector starting from 2006; in the case of the fisheries and aquaculture sector, data is available for only 11 countries (Argentina, Bahamas, Brazil, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico,

Peru, and Suriname) from 2010 onwards. The FAO's FISHSTAT database is likely the most comprehensive source of information on the sector, though it contains far less data than FAOSTAT, which covers the agricultural sector. Nonetheless, the available information is sufficient to analyze some important trends.

Regarding fisheries and aquaculture production, FISHSTAT does not provide information on the value of production but does offer data on catch volumes (in tons). Taking the average of the last three available years (2019 to 2021), a high level of concentration becomes evident: Peru accounts for almost 44% of marine catches, followed by Chile (18%) and Mexico (12%). Together, these three countries represent nearly three-quarters of the total marine catches in the region **(Figure 29).**

FIGURE 29. MARINE CATCHES OF COUNTRIES IN THE REGION

(IN TONS, AVERAGE 2019-2021)

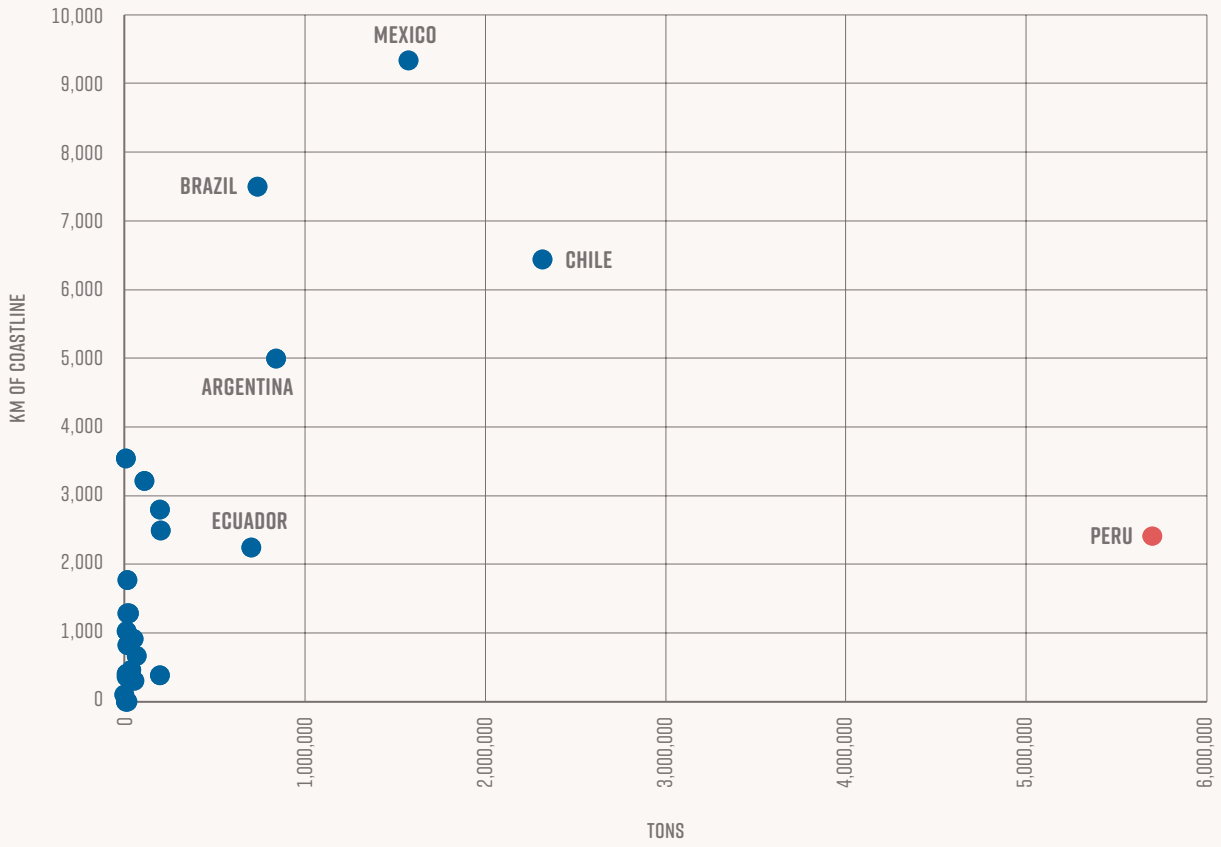


Source: Own elaboration based on FISHSTAT data.

This level of concentration is similar to what has been observed previously in agricultural production: Brazil, Argentina, and Mexico also account for around three-quarters (76%) of the total production in the region. The share of each country in total agricultural production reflects their relative size, as these three countries represent 69% of the Agricultural land in LAC. However, in the case of marine fishing, Peru stands out due to its fishing intensity and ranks as the third-largest producer in the world (6.2% of the global total, behind China at 14.8% and Indonesia at 7.7%). As expected, there is a positive correlation between the length of a country's coastline and the amount of fish it catches, but Peru captures a much higher proportion of fish than its share of the LAC coastline **(Figure 30).**

FIGURE 30. RELATIONSHIP BETWEEN COASTAL LENGTH AND MARINE CATCHES

(AVERAGE 2019-2021)

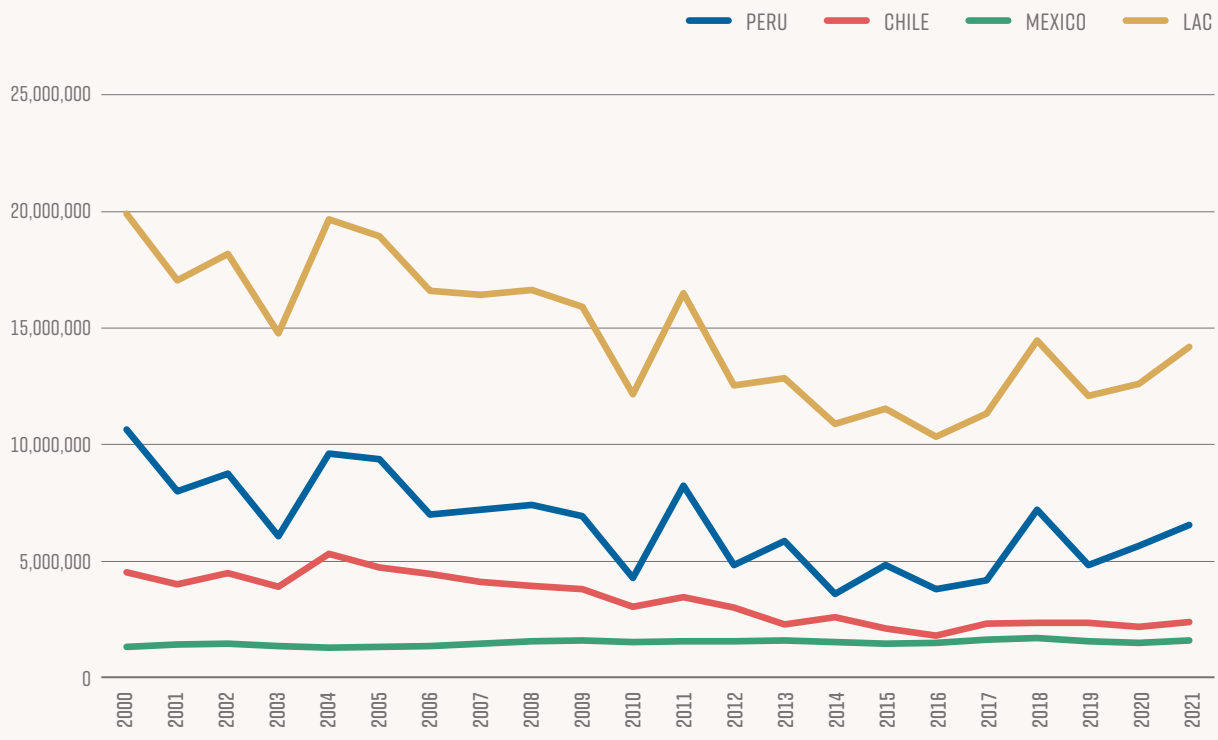


Source: Own elaboration based on data from FISHSTAT and The World Factbook for coastal length data (cia.gov/the-world-factbook/field/coastline).

Due to Peru's significant role in the sector, the pattern of marine catches in LAC closely follows that of Peruvian catches **(Figure 31).** While these had been gradually declining, they began to recover after 2016. Chile has also contributed to this recovery, although on a much smaller scale. This is interesting from an environmental perspective, as the coasts of Chile and Peru are within the Southeast Pacific fishing area, which has the lowest rate of biological sustainability of fish stocks globally, at 33.3%. The other three fishing areas surrounding LAC have substantially higher sustainability levels: the Eastern Central Pacific at 85.7%, the Western Central Atlantic at 62.3%, and the Southwest Atlantic at 60% (FAO 2022). However, analyses of more specific areas may reveal much lower sustainability levels. For instance, a 2011 study on the state of Mexico's waters found that 19.4% were in "collapse" and 37.1% were in overfished condition (Lema et al. 2022, Table 7).

FIGURE 31. MARINE CATCHES IN LAC, PERU, CHILE, AND MEXICO

(IN TONS, AVERAGE 2019-2021)

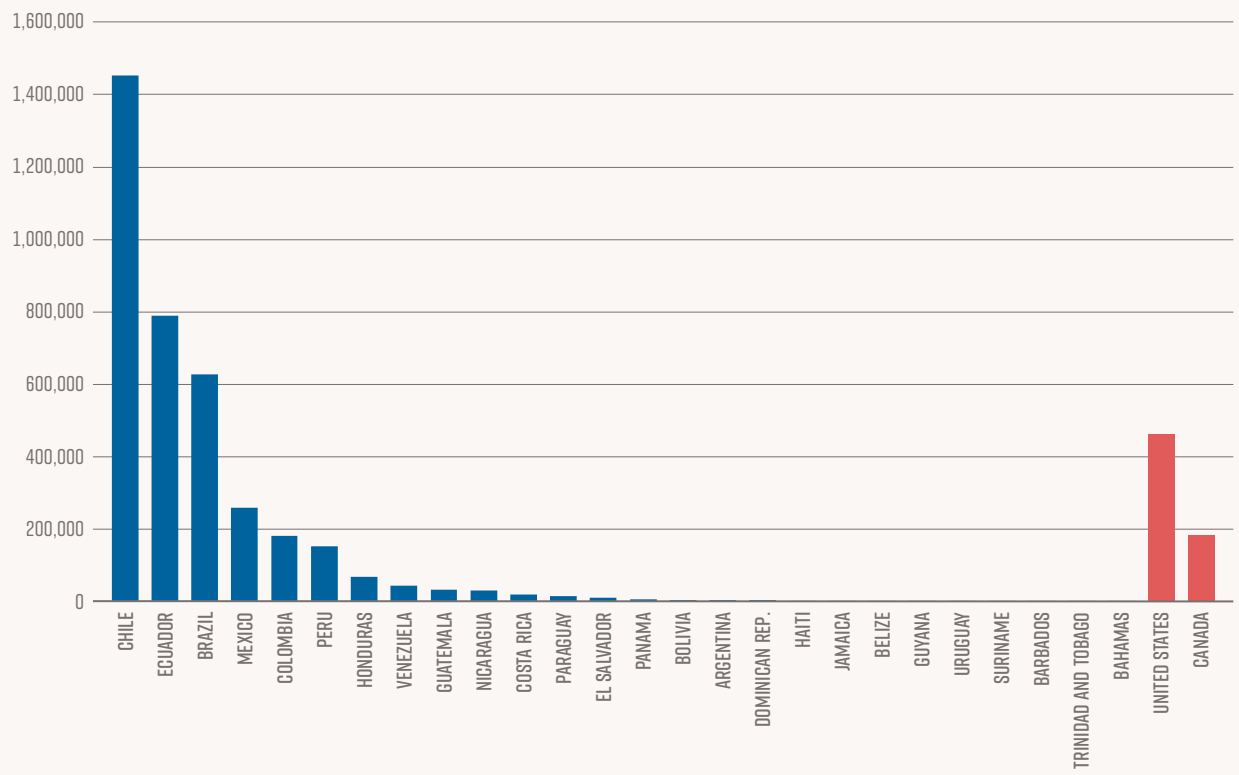


Source: Own elaboration based on FISHSTAT data.

Aquaculture, for its part, also has a high level of concentration, even greater than fisheries. The three main producing countries account for 78% of regional production (measured by weight): Chile, 39.3%; Ecuador, 21.3%; and Brazil, 17% **(Figure 32).**

FIGURE 32. AQUACULTURE PRODUCTION OF LAC COUNTRIES

(IN TONS, AVERAGE 2019-2021)

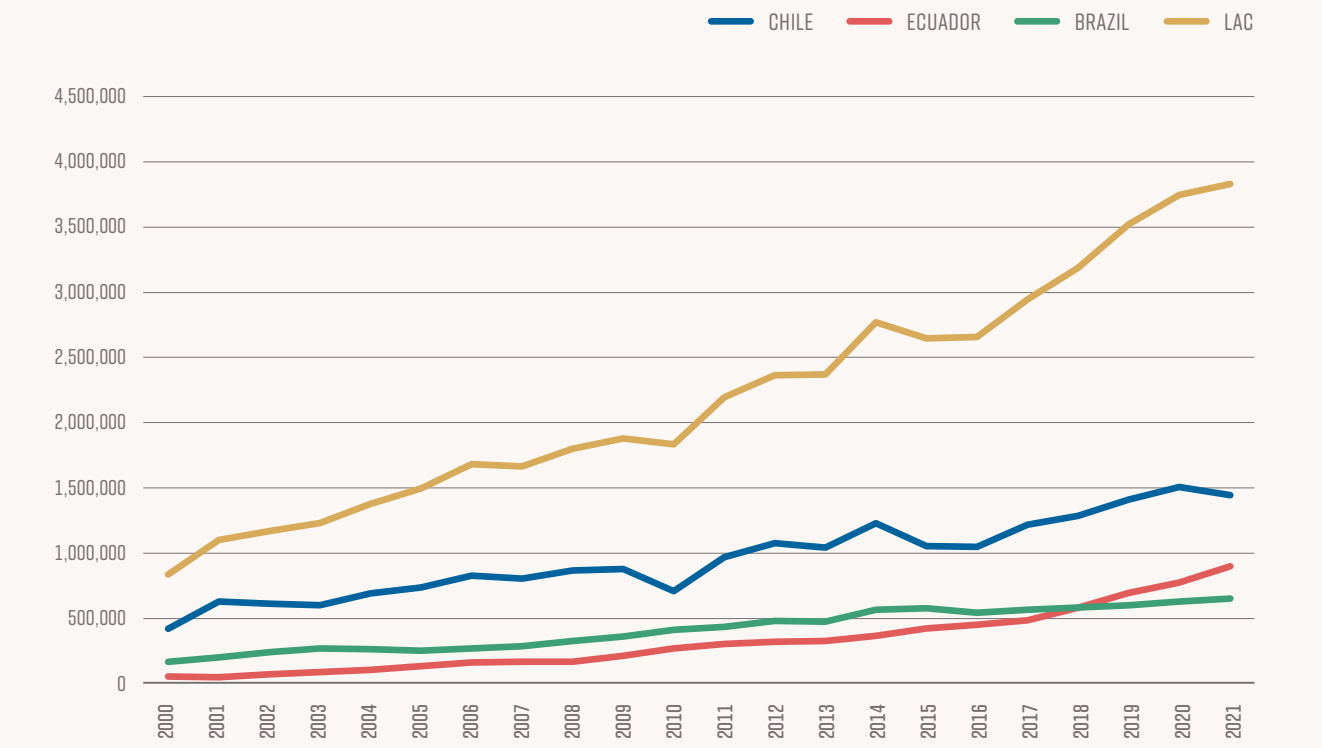


Source: Own elaboration based on FISHSTAT data.

Chile's production is significantly higher than that of the other countries in the region, and even higher than that of the United States and Canada; however, it ranks tenth globally, accounting for only 1.2%. Aquaculture in LAC is still much smaller than fisheries, although it has experienced rapid growth between 2000 and 2021 (at an average rate of 7.5% per year) **(Figure 33).** Despite the decline in fish catches between 2000 and 2016 and the growth of aquaculture, the latter represents only 22% of the total production of fish and seafood. Overall production has followed a pattern similar to that of marine catches: a decline until 2016, followed by a rebound thereafter.

FIGURE 33. EVOLUTION OF AQUACULTURE PRODUCTION IN LAC AND THE THREE MAJOR PRODUCERS

(IN TONS)

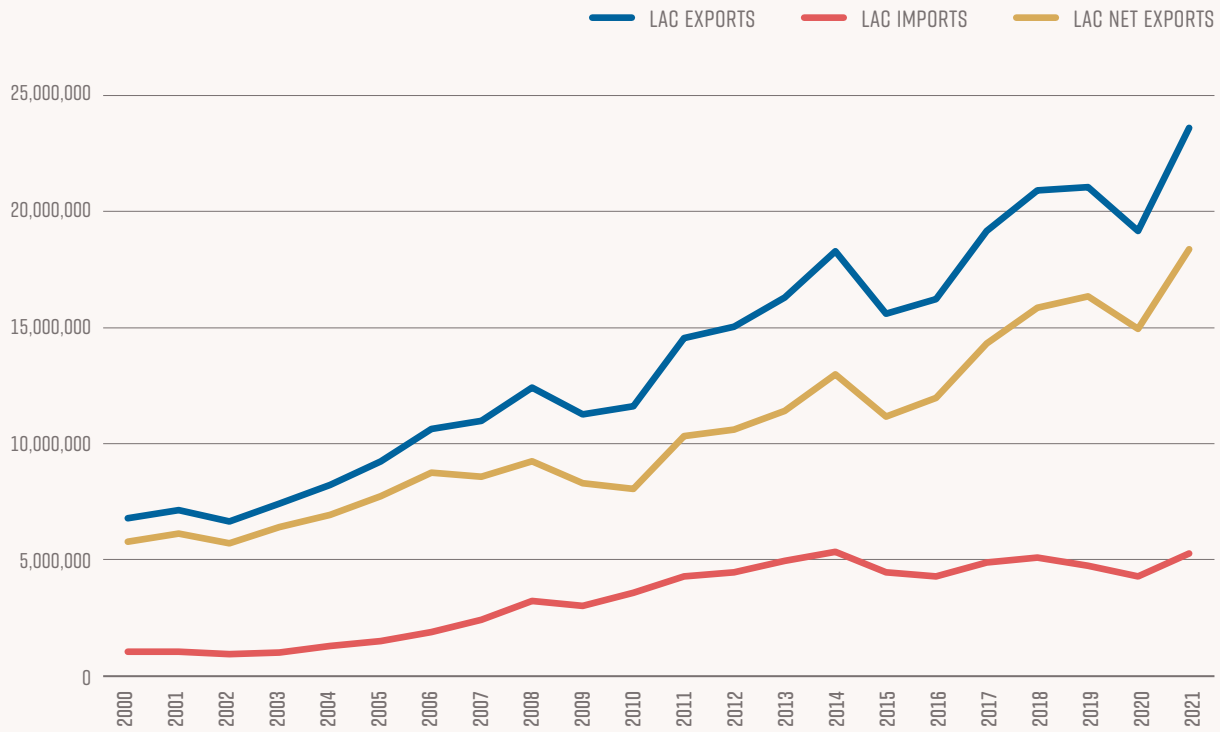


Source: Own elaboration based on FISHSTAT data.

LAC is also a net exporter of fishery products. Its exports have grown rapidly (at an average of 6% per year) since 2000, while imports have increased more slowly and have actually stagnated since 2014 **(Figure 34).** Around 75% of the exports come from three countries: Chile (with 30.9%), Ecuador (28.3%), and Peru (16%). Notably, Ecuador allocates a significant portion of its production for export: it is the sixth-largest producer in the region (with 8.9% of the total combined fish and aquaculture production) and ranks second in terms of exports.

FIGURE 34. EVOLUTION OF FOREIGN TRADE IN FISHERY PRODUCTS (FISHING AND AQUACULTURE) FROM LAC

(IN THOUSANDS OF DOLLARS)

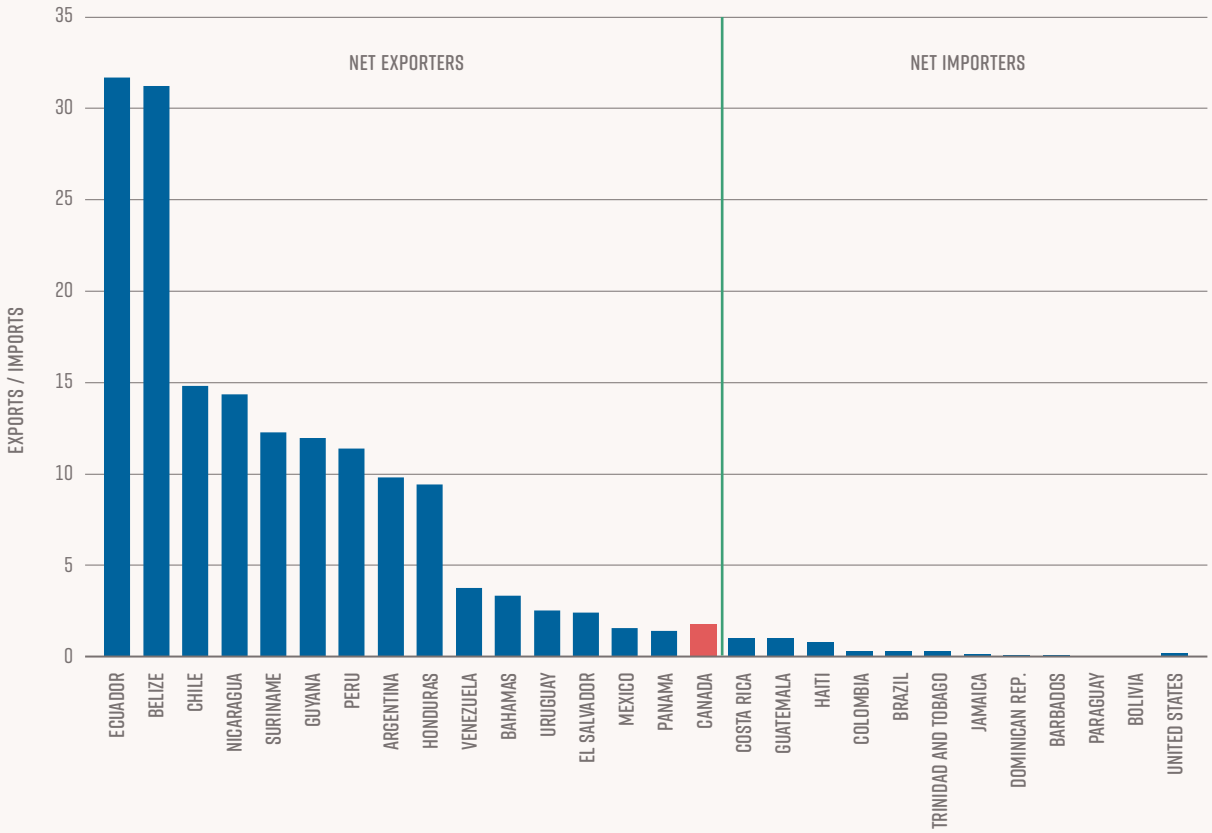


Note: The figures include intraregional trade.

Source: Own elaboration based on FISHSTAT data.

Not all countries are net exporters, and some, despite being large exporters, are also significant importers. Brazil, for example, exports 1.6% of the regional total, but its imports are 2.5 times greater. Similarly, several countries that do not stand out in terms of volume due to the small size of their sectors emerge as relatively strong exporters. Belize, for instance, ranks alongside Ecuador, with an export level more than 30 times higher than its imports. Nicaragua, Suriname, and Guyana, on the other hand, have a level of exports relative to their imports slightly lower than Chile's and higher than Peru's **(Figure 35).**

FIGURE 35. EXPORTS AS A PROPORTION OF FISHERY AND AQUACULTURE IMPORTS IN LAC COUNTRIES

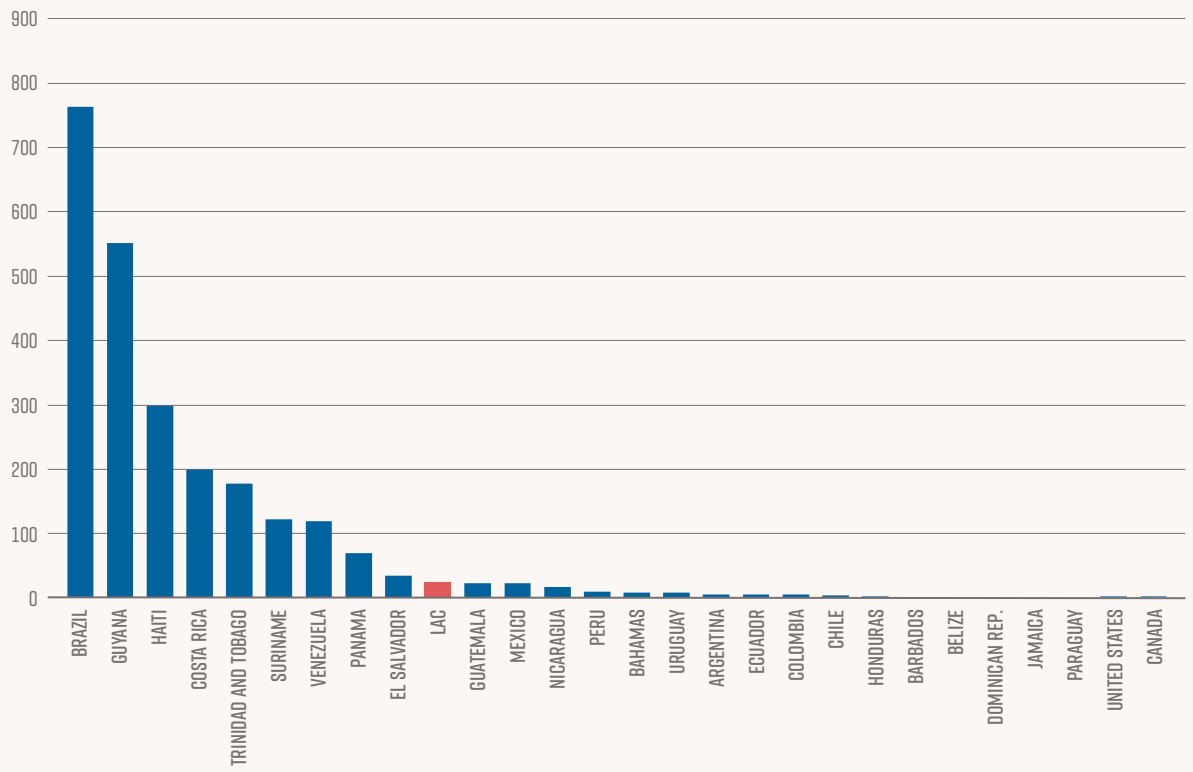


Source: Own elaboration based on FISHSTAT data.

Another important indicator of a country's export capacity is the rejections faced by its products, as these are inversely related to quality. Rejections can be due to the presence of toxic substances or bacteria, poor temperature control during transport, deficiencies in health certificates, or labeling issues, among other reasons. The main exporters in the region —Chile, Ecuador, and Peru— experience very few rejections relative to the amount they export, but other countries have much higher levels. Brazil stands out as having the highest number of rejections **(Figure 36).**

FIGURE 36. REJECTED EXPORTS TO LAC COUNTRIES

(PER US$1,000 MILLION EXPORTED)



Source: Own elaboration based on FISHSTAT data.

6.2. TRENDS IN SUPPORT POLICIES FOR THE SECTOR

These policies can contribute to the development of the sector by improving both the individual conditions of fishermen (for example, through transfers, subsidies for the use of inputs, or training to enhance their fishing practices and product handling to maintain quality) **and the general conditions of the sector** (through investment in research and development, health services, certification and public infrastructure, etc.). The Agrimonitor database includes a series of estimates of the different types of support for the sector across 11 countries (plus the United States and Canada), following the methodology of the Fisheries Support Estimate (FSE).

The FSE presents very disparate levels among the countries in the region, partly due to differences in the size of the sector. To make comparisons, it is necessary to adjust this size. In this regard, it would be desirable to have the value of production, but only 7 of the 11 countries included in Agrimonitor have this information. As an alternative, the total support value per ton captured was calculated **(Table 8).**

The levels of support for the sector are extremely different among countries: Chile provides only 1.5% of the value of production (between US$5 and US$8 per ton of fish, depending on whether aquaculture production is considered), while Costa Rica provides support equivalent to 89.5% of the value of production (between US$470 and US$1,263 per ton of fish). Suriname provides double the support per ton compared to Costa Rica (considering only marine fishing), but this seems to represent a much smaller proportion of the value of production, which indicates that fish products in Suriname have a much higher value per ton than those in Costa Rica. In the case of Honduras, although the value of production is not available, the level of support per ton is by far the highest among the 11 countries. Almost all of that support comes through investments in general services.

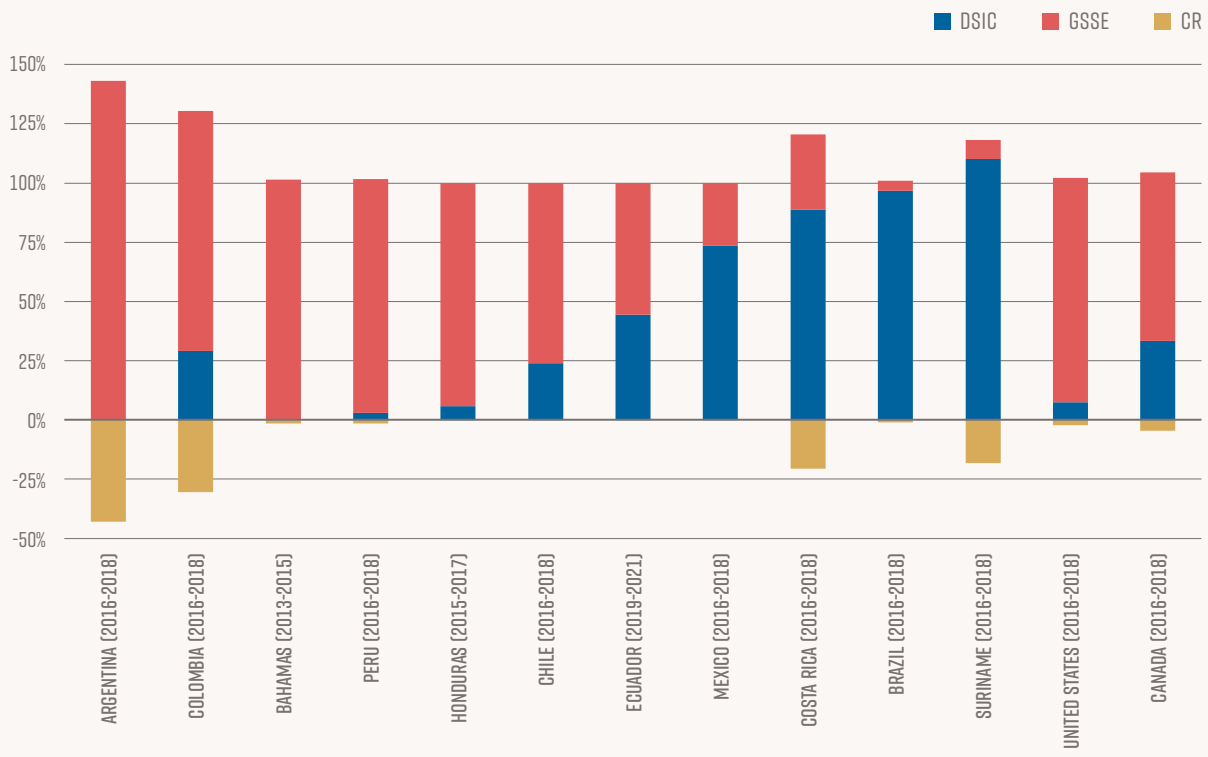
TABLE 8. TOTAL SUPPORT TO THE FISHING SECTOR AS A PROPORTION OF PRODUCTION

ESTIMATION OF TOTAL SUPPORT DIVIDED BY...	VALUE OF PRODUCTION %	FISH PRODUCTION USD/TON	FISH AND AQUACULTURE PRODUCTION USD/TON
HONDURAS (2015-2017)	N.D.	$46,595	$7,283
SURINAME (2016-2018)	6.3%	$2,692	$2,686
COSTA RICA (2016-2018)	89.5%	$1,263	$470
BRAZIL (2016-2018)	N.D.	$857	$481
COLOMBIA (2016-2018)	42.4%	$53	$21
MEXICO (2016-2018)	6.4%	$46	$40
ARGENTINA (2016-2018)	1.6%	$45	$45
ECUADOR (2019-2021)	N.D.	$40	$19
BAHAMAS (2013-2015)	0.3%	$39	$39
PERU (2016-2018)	N.D.	$17	$17
CHILE (2016-2018)	1.5%	$8	$5
CANADA (2016-2018)	25.8%	$817	$667
UNITED STATES (2016-2018)	15.4%	$180	$165

Source: Own elaboration based on data from Agrimonitor and FISHSTAT.

The estimate of total support for the fisheries sector consists of three elements: **direct support to individuals and companies (DSIC), plus support for sector services (GSSE), minus cost recovery (CR), which includes the payment of fees that fishermen make to be able to fish.**[34] Of the 11 countries in LAC with information on support for the fishing and aquaculture sector in the Agrimonitor database, only four have cost recovery. Among them, Argentina has the highest recovery as a percentage of the FSE; conversely, like the Bahamas, it does not provide any direct support to its fishermen (individuals or companies). All the support that the sector receives in these two countries (more than 90%) comes through investments in general services. The same is observed in Colombia, Peru, and Honduras **(Figure 37).** In Costa Rica, Brazil, and Suriname, the composition is the opposite: 89% or more of the FSE is granted through direct support to their fishermen.

FIGURE 37. DECOMPOSITION OF TOTAL SUPPORT TO THE FISHING AND AQUACULTURE SECTOR

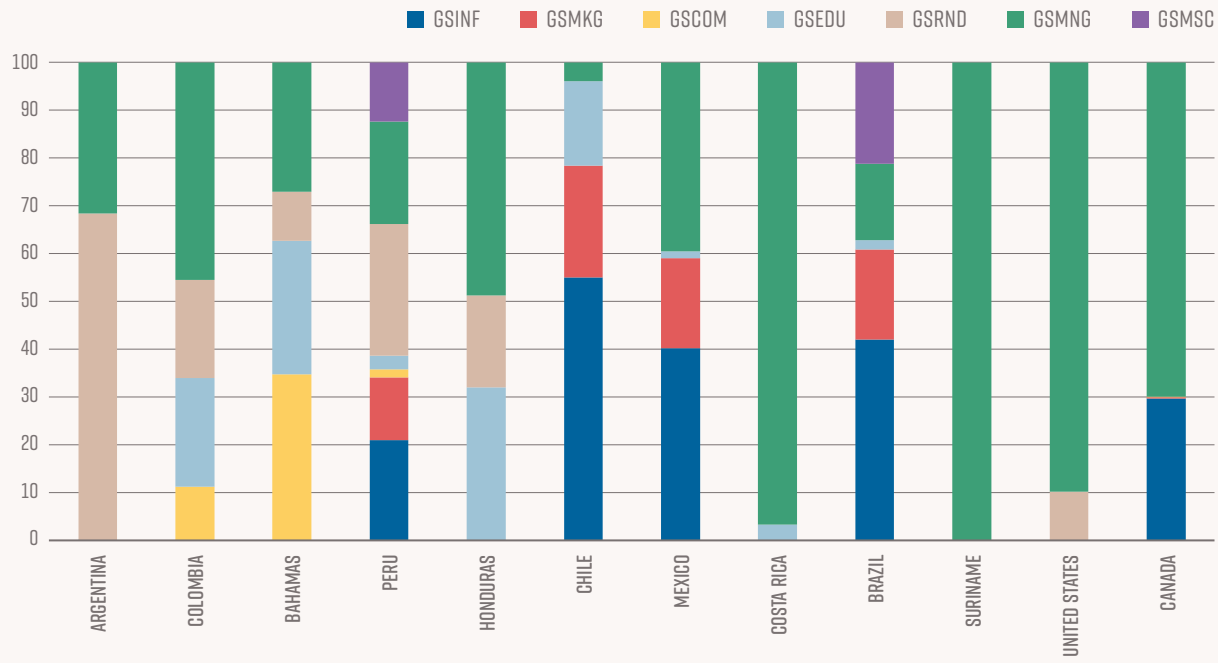


Note: The years used to calculate the average are shown in parentheses, above the name of the country.
Source: Own elaboration based on Agrimonitor data.

34. For the time being, the methodology does not include the estimation of market price support due to the high cost of conducting it (see OECD, 2015).

Within the category of GSSE for the sector, there are seven elements: (i) infrastructure (GSINF), (ii) promotion and marketing (GSMKG), (iii) support to fishing communities (GSCOM), (iv) human capital (GSEDU), (v) research and development (GSRND), (vi) resource management[35] (GSMNG), and (vii) miscellaneous (GSMSC). As seen in **Figure 38,** countries that allocate a high percentage of their total sector support to general services (Argentina, Colombia, Bahamas, Peru, and Honduras) have a very diverse composition of these investments, but they share something in common: they are the only ones allocating resources to research and development (with Argentina standing out, where this concept represents 68% of its GSSE). On the other hand, although the 10 LAC countries with available information[36] devote a significant portion of their general services investment to resource management, Costa Rica and Suriname allocate 97% and 100%, respectively, to these activities. It is also noteworthy that only four countries (Peru, Chile, Mexico, and Brazil) allocate resources to infrastructure investments.

FIGURE 38. DECOMPOSITION OF SUPPORT FOR GENERAL SERVICES



Source: Own elaboration based on Agrimonitor data.

35. This includes "transfers that finance management activities aimed at improving the productivity or sustainability of aquatic resources" (OECD 2015, 12).

36. Ecuador has no information about the composition of its investments in general services.

6.3. BRIEF ANALYSIS OF THE MAIN POLICIES IMPLEMENTED IN THE FISHERIES AND AQUACULTURE SECTOR

The question that arises is **what relationship exists between the different types of support provided to the sector and its performance in terms of production, exports, or other variables.** The amount of data available is not sufficient to conduct a statistically robust correlation analysis. Even visual analyses (based on graphs of the various support levels alongside available economic performance variables) do not reveal any clear patterns. In light of this, this section provides a brief overview of the main public policies implemented in the fisheries and aquaculture sector in three of the main LAC countries in terms of catches and production.

PERU has an extensive institutional framework for regulating and supporting the sector, led by the Ministry of Production (PRODUCE). Its competencies, functions, and resources are divided among three levels of government: national, regional, and municipal. Additionally, there are four agencies attached to PRODUCE:

- **The National Fisheries Development Fund,** which provides financing to increase the productivity of artisanal fishing and aquaculture.
- **The Peruvian Sea Institute,** which promotes scientific research in the sector.
- **The Production Technology Institute,** which seeks to improve the competitiveness of production sectors through the management of the Centers for Productive Innovation and Technological Transfer.
- **The National Fisheries Health Agency,** responsible for health control.

Other agencies with competencies in the sector include the General Directorate of Captaincies and Coast Guards, the National Water Authority, the National Service of Protected Natural Areas, the Environmental Evaluation and Oversight Agency, and the National Superintendency of Labor Oversight. Additionally, PRODUCE implements the National Program "A Comer Pescado" (Let's Eat Fish), aimed at consolidating the domestic market, and the National Innovation Program in Fisheries and Aquaculture, aimed at strengthening sector governance.

Despite this institutional framework and the socioeconomic importance of the sector, as Paredes et al. (2021) indicate, Peru lacks a national fisheries policy that defines "priority objectives, guidelines, and key components of public policy". A marked duality persists in the sector: large-scale fishing is "modern, profitable, sustainable, and supervised, [while] artisanal fishing is characterized by high levels of informality, insufficient oversight, control, and sanctions regarding landings, and outdated statistics to assess performance and inform decision-making" (25). However, the country has implemented specific policies, such as the *National Plan for the Development of Artisanal Fishing* (2004–2007) and the *National Plan for the Development of Fishing Infrastructure for Direct Human Consumption* (2010). More recently, from 2016 to 2020, the Peruvian government created the *System for the Formalization of Artisanal Fisheries* and the *Budgetary Program for Strengthening Artisanal Fisheries*. At the same time, it has promoted innovation and research through the *National Innovation Program in Fisheries and Aquaculture.*

The second country analyzed is **ECUADOR,** which in recent years has implemented significant changes to its institutional and policy framework for fisheries and aquaculture, allowing for better organization and growth in the sector (see Flores et al., 2023). In 2017, a ministry dedicated exclusively to fisheries and aquaculture was created, though a little over a year later, it was downgraded to a vice-ministry within the new *Ministry of Production, Foreign Trade, Investments, and Fisheries.* Additionally, in 2020, the *Organic Law for the Development of Aquaculture and Fisheries* was passed, which focuses on resource sustainability and aims to prevent, deter, and eliminate illegal, unreported, and unregulated fishing. To boost the sector, the government created the *National Fund for Aquaculture and Fisheries Research,* providing funding for scientific research and technological development. Ecuador is also implementing productive development programs to ensure food safety, trade promotion, export growth, and the provision of energy and fuel. Notable initiatives include:

- ***The Project to Improve Competitiveness in the Aquaculture and Fisheries Sector*** in 2020, aimed at implementing fisheries policy reform and meeting international standards for quality and safety.
- The 2020 ***trade agreement with China,*** which, among other things, reduces tariffs and establishes sanitary and phytosanitary protocols for agricultural and agro-industrial products, including shrimp (Ecuador's main non-oil export).
- ***The elimination of the diesel subsidy*** for the shrimp sector at the end of 2022.

Finally, **MEXICO**'s public policy in recent years has been implicitly aimed at reducing pressure on fishery resources without decreasing fishers' income. Between 2000 and 2018, subsidies for variable inputs and capital renewal were significantly reduced, while direct income support for fishers increased substantially. This is an important shift, not only because global studies have found that subsidies contribute to overexploitation of fishery resources (Damania et al. 2023), but also because the subsidy system in Mexico's fishing sector is asymmetrical and tends to provide fewer benefits to artisanal fisheries, even though they generate more production and employment than industrial fisheries (Lema et al. 2022).

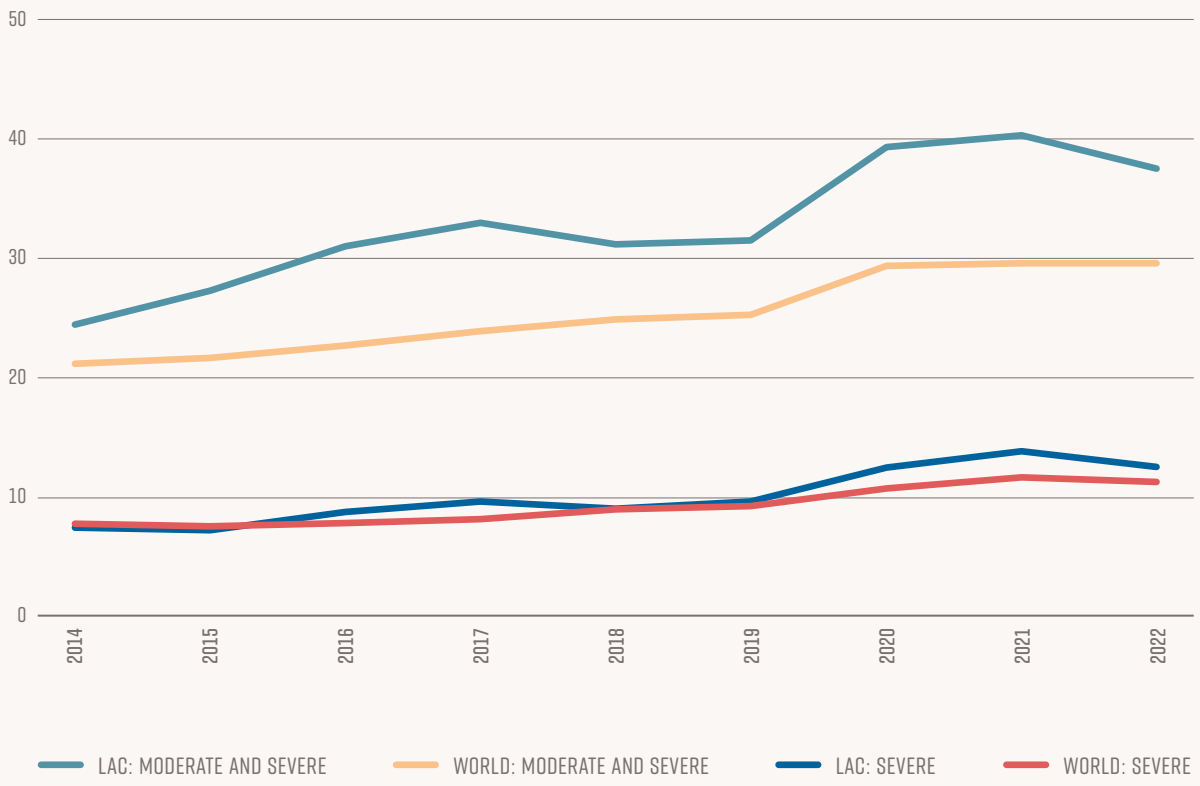
7. FOOD SECURITY

In Section 2, the rise in international food prices was highlighted, a situation worsened by the COVID-19 pandemic and, later, by the conflict between Russia and Ukraine. This raises the question of what effects this price increase has had on food security in the region and what policies have been implemented to counteract them.

The impact of rising prices in the region can vary greatly between countries and, within them, among different types of economic actors. Countries that export the affected products benefit from higher prices. However, as international price increases are transmitted to domestic markets (either directly through more expensive imports or indirectly through increased exports and reduced domestic availability), consumers face a decline in purchasing power. This seems to be happening in the region and has negative effects on food security.

FIGURE 39. EVOLUTION OF MODERATE OR SEVERE FOOD INSECURITY IN LAC AND THE WORLD

(AS A PERCENTAGE OF THE POPULATION)

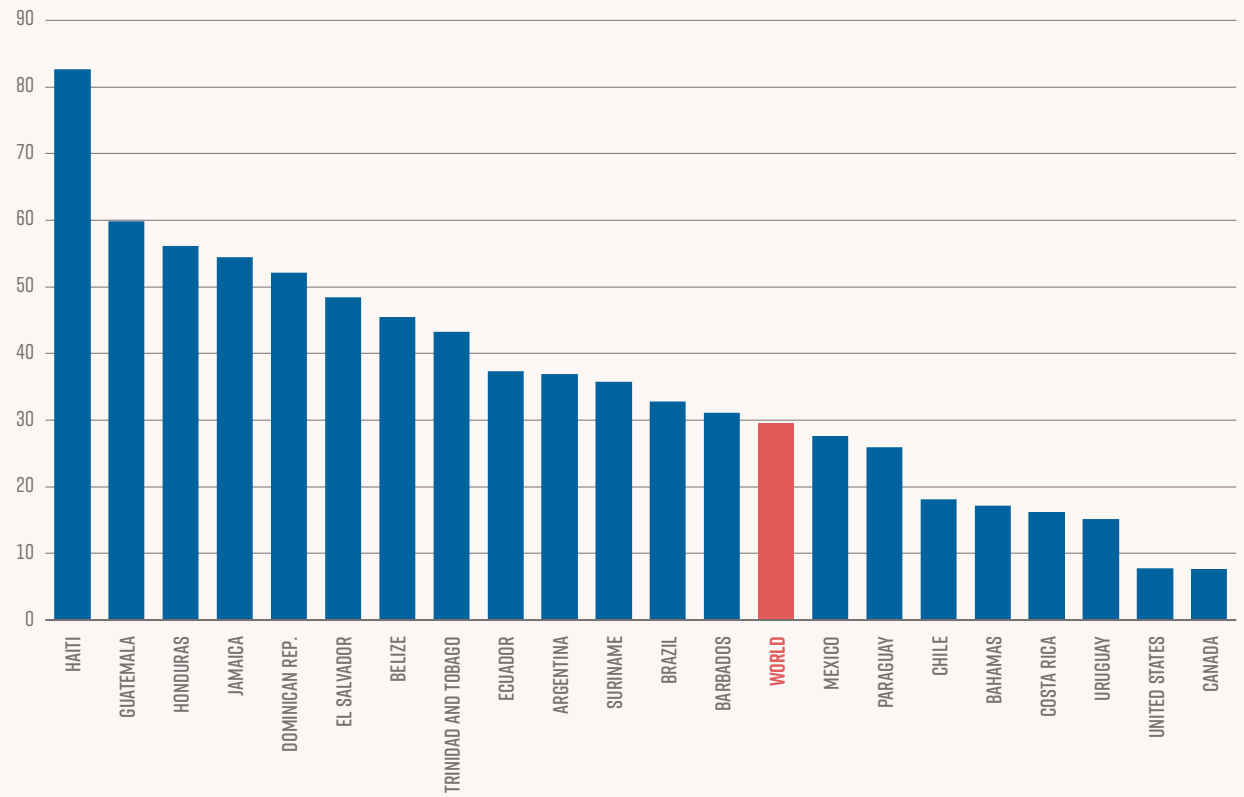


Source: Own elaboration based on FAOSTAT data.

In recent years, food insecurity has seen a significant rise in LAC. Between 1990 and 2014, the region managed to reduce the prevalence of hunger by more than half; however, since 2014, the percentage of the population facing moderate or severe food insecurity has continued to increase **(Figure 39).** While this is a global phenomenon, the setback in food security in LAC has been more rapid and worsened further with the COVID-19 pandemic and the war between Russia and Ukraine (Salazar 2023). Currently, most countries in the region have food insecurity levels above the global average (29.5%), and in some cases, more than half of the population experiences moderate or severe food insecurity **(Figure 40).**

FIGURE 40. PREVALENCE OF MODERATE AND SEVERE FOOD INSECURITY IN LAC COUNTRIES AND GLOBAL AVERAGE

(AS A PERCENTAGE OF THE POPULATION, AVERAGE 2020-2022)



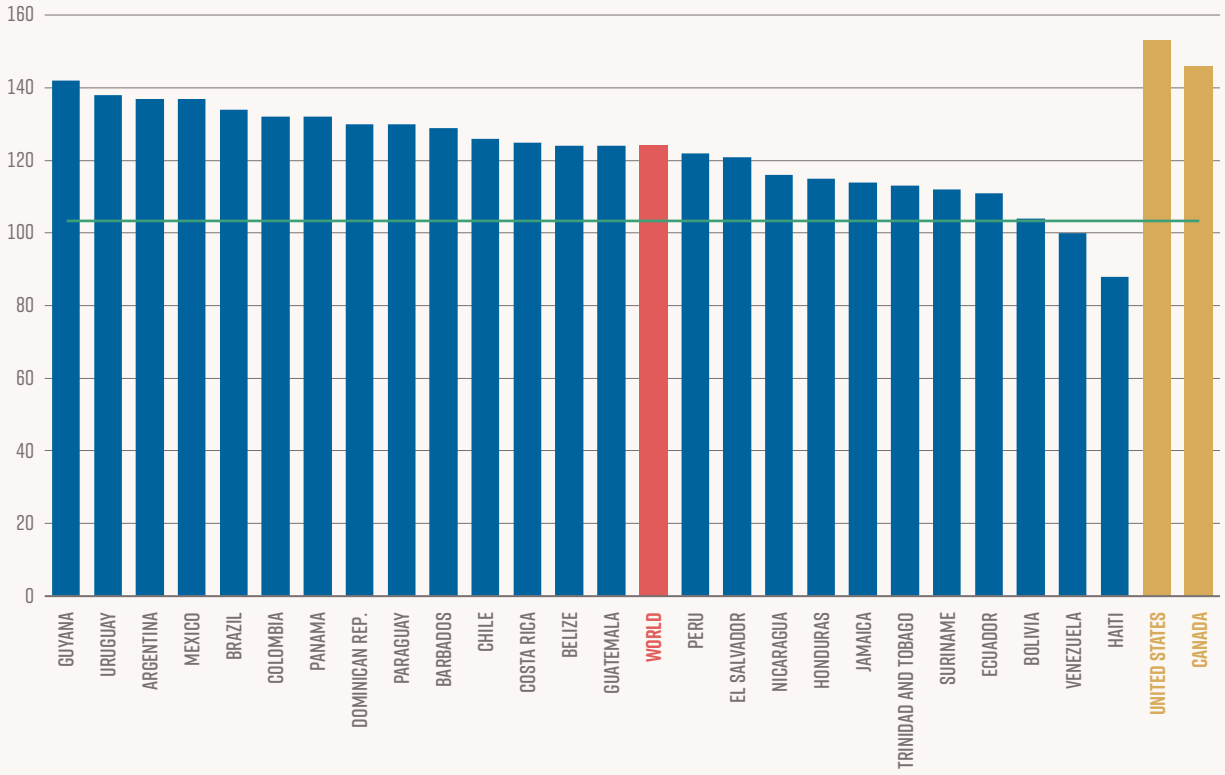
Source: Own elaboration based on FAOSTAT data.

The increase in food insecurity in LAC is primarily due to a decline in economic access to food, driven by a combination of higher prices and lower incomes, rather than a lack of food availability. While food insecurity has risen, the average energy supply in diets has not decreased[37]. In fact, it has slightly increased in many countries and, except for Haiti and Venezuela, remained above the caloric requirement for a healthy person **(Figure 41).**

37. This indicator presents "the energy supply of the diet [...] as a percentage of the average dietary energy requirement [...] The calorie supply for food consumption in each country or region is normalized by the estimated average dietary energy requirement for its population" (FAOSTAT, document "Descriptions and metadata" from the food security indicators dataset, available at https://www.fao.org/faostat/en/#data/FS/metadata).

FIGURE 41. AVERAGE ENERGY SUPPLY OF THE DIET

(AS A PERCENTAGE OF THE CALORIC REQUIREMENT FOR A HEALTHY PERSON, AVERAGE 2020-2022)



Source: Own elaboration based on FAOSTAT data.

Agricultural policies can influence food security by stimulating food production (increasing availability) and altering market prices (affecting economic accessibility). As discussed in Section 2, some countries in the region responded to the COVID-19 pandemic by imposing export restrictions on food products, with the aim of ensuring supply and reducing prices. The impact of these measures on prices should be reflected in two sectoral support indicators: market price support to producers (MPS) and, inversely, support to consumers (CSE). Thus, it is relevant to analyze how consumer support has behaved while food prices have risen, and food security has deteriorated. **Table 9** presents the average annual increase in food prices before and after the COVID-19 pandemic, as well as the CSE in both absolute terms (in millions of dollars) and relative terms (as a percentage of consumption expenditure).

TABLE 9. FOOD INFLATION AND CONSUMER SUPPORT ESTIMATE

	FOOD INFLATION			CSE		CSE
	2000 TO 2019	2019 TO 2022	2000 TO 2022	(US$ MILL.)	(% OF EXPENDITURE)	PERIOD
SURINAME	12.7%	63.3%	18.5%	$ -64	-31%	'16 - '18
ARGENTINA	16.0%	60.9%	21.3%	$ 6,838	22%	'19 - '21
HAITI	11.1%	32.0%	13.8%	$ -511	-23%	'10 - '12
COLOMBIA	5.8%	16.2%	7.1%	$ -3,395	-15%	'19 - '21
CHILE	4.6%	12.3%	5.6%	$ -60	-1%	'19 - '21
BRAZIL	7.4%	11.2%	7.9%	$ -385	0%	'19 - '21
BARBADOS	5.9%	10.3%	6.5%	$ -19	-24%	'12 - '14
NICARAGUA	8.0%	10.0%	8.3%	$ -475	-26%	'15 - '17
MEXICO	5.4%	10.0%	6.0%	$ -1,914	-3%	'19 - '21
DOMINICAN REPUBLIC	8.2%	9.6%	8.4%	$ -748	-18%	'17 - '19
URUGUAY	9.7%	9.2%	9.7%	$ -127	-8%	'18 - '20
JAMAICA	10.2%	9.2%	10.1%	$ -464	-39%	'17 - '19
PERU	2.8%	9.2%	3.7%	$ -1,384	-9%	'16 - '18
TRINIDAD AND TOBAGO	11.8%	9.0%	11.4%	$ -67	-19%	'13 - '15
HONDURAS	5.2%	8.7%	5.7%	$ -270	-13%	'15 - '17
COSTA RICA	7.5%	8.4%	7.6%	$ -270	-12%	'19 - '21
PARAGUAY	7.8%	8.2%	7.9%	$ –	0%	'16 - '18
BAHAMAS	1.7%	8.2%	2.5%	$ -23	-18%	'12 - '14
GUATEMALA	8.5%	7.8%	8.4%	$ -553	-9%	'16 - '18
EL SALVADOR	3.2%	6.7%	3.7%	$ -485	-27%	'15 - '17
BELIZE	1.6%	6.7%	2.3%	$ -26	-19%	'12 - '14
ECUADOR	6.3%	2.8%	5.8%	$ -317	-9%	'19 - '21
PANAMA	3.1%	2.5%	3.0%	$ -905	-34%	'17 - '19
BOLIVIA	6.0%	2.0%	5.4%	$ -704	-13%	'16 - '18
GUYANA	N.D.	N.D.	N.D.	$ -63	-16%	'17 - '19
VENEZUELA	207.1%	790.6%	255.1%	N.D.	N.D.	N.D.

Source: Own elaboration based on data from Agrimonitor and FAOSTAT.

The information in Table 9, while relevant, does not allow for the identification of significant correlations between food inflation and consumer support (CSE), as the observations for each are not contemporaneous. To compare simultaneous changes, the analysis must focus on those countries with data available both before and after the onset of the pandemic, when the rise in food prices accelerated, and food security deteriorated further (Table 10).

TABLE 10. FOOD INFLATION AND CONSUMER SUPPORT BEFORE AND AFTER COVID-19

	FOOD INFLATION		CSE (US$ MILL)		CSE (% OF EXPENDITURE)	
	2009 TO 2019	2020 TO 2022	2009 TO 2019	2020 TO 2021	2009 TO 2019	2020 TO 2021
ARGENTINA	18.9%	60.9%	$ 5,376	$ 6,069	23.5%	17.2%
BRAZIL	6.9%	11.2%	$ -545	$ -1,014	-0.4%	-0.8%
CHILE	4.2%	12.3%	$ -39	$ -78	-0.4%	-0.7%
COLOMBIA	3.7%	16.2%	$ -4,447	$ -2,905	-20.9%	-13.1%
COSTA RICA	2.3%	8.4%	$ -298	$ -262	-14.3%	-11.6%
ECUADOR	2.8%	2.8%	$ -510	$ -225	-9.3%	-6.2%
MEXICO	5.0%	10.0%	$ -1,279	$ -1,807	-2.2%	-2.9%
URUGUAY	8.4%	9.2%	$ -86	$ -137	-5.4%	-8.7%

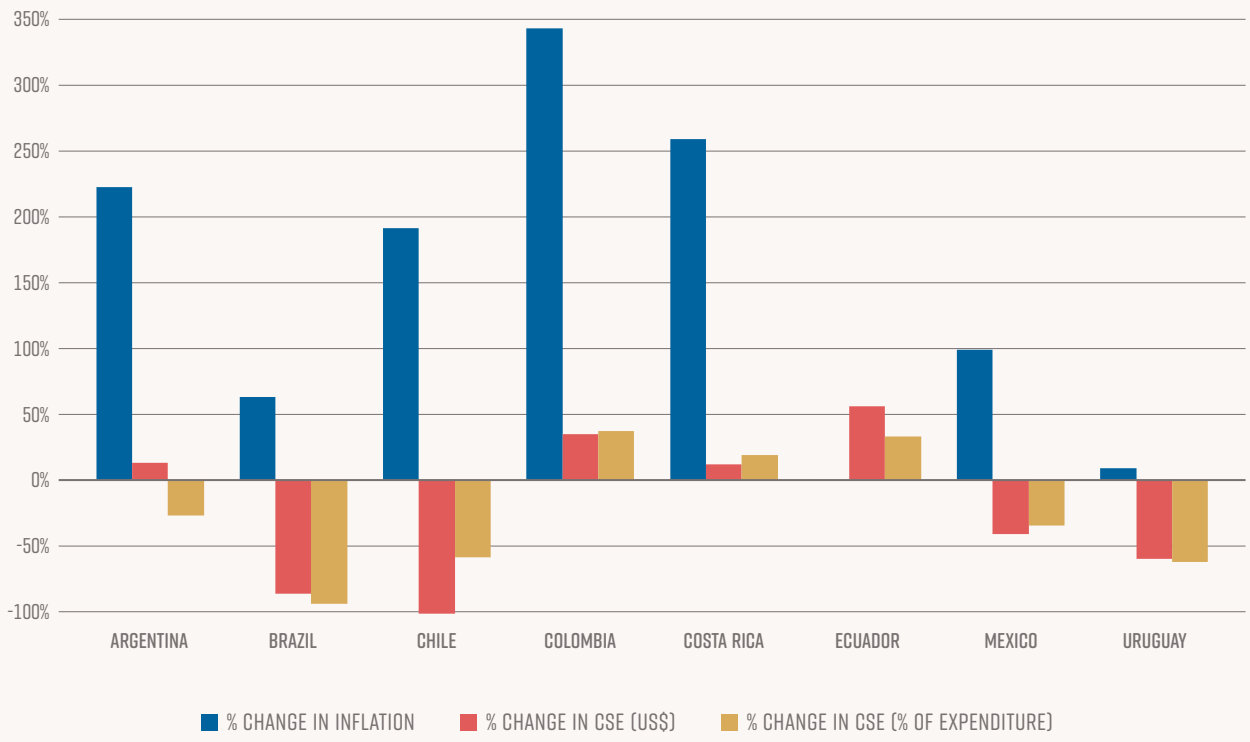
Note: Uruguay only has information on CSE for the period from 2009 to 2020.
Source: Own elaboration based on data from Agrimonitor and FAOSTAT.

An interesting first observation is that while the average annual food inflation increased throughout the entire period under analysis (2019–2022) in the eight countries included, only four (Argentina, Colombia, Costa Rica, and Ecuador) increased consumer support. Three of these countries also experienced the largest increases in food inflation rates before and after the pandemic: Colombia by 344%, Costa Rica by 259%, and Argentina by 223%. Given the significant differences in initial inflation levels and consumer support across countries (2009–2019), it is essential to analyze the relationship between relative changes —specifically, the percentage changes in food inflation and consumer support **(Figure 42).**

As seen in **Figure 42,** there are indications of a positive relationship between the rise in food inflation rates and the increase in consumer support: in countries where inflation rose more sharply, consumer support increased more significantly. However, this finding should be interpreted cautiously due to the methodological limitations involved. It should not be taken as evidence of consumer support's ineffectiveness as a tool for reducing food inflation. The counterfactual situation is unknown: it is possible that without the increase in consumer support, inflation in those countries could have risen even more. In fact, the causality could be reversed: in countries where food prices were rising more rapidly, governments may have been forced to react with greater consumer support.

FIGURE 42. VARIATION IN INFLATION AND CONSUMER SUPPORT PERCENTAGES

(2009-2019 VS. 2020-2021)



Note: Since Uruguay only has information on consumer support for the period from 2009 to 2020, the sign of the changes in CSE does not necessarily correspond to the arithmetic result but has been imposed to illustrate the direction of the change.

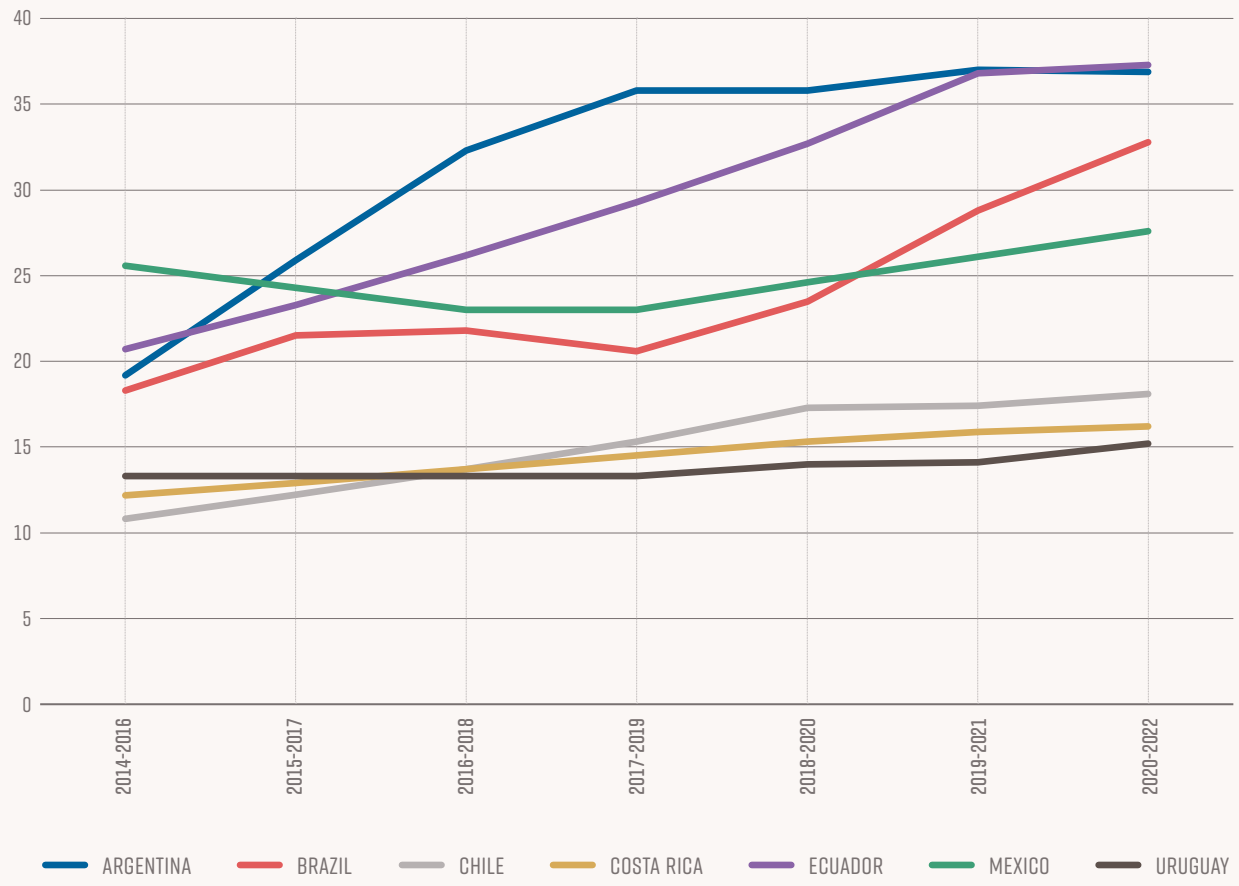
Source: Own elaboration based on data from Agrimonitor and FAOSTAT.

Returning to food security, **Figure 43** shows the prevalence of severe and moderate food insecurity among the adult population in seven of the eight countries analyzed.[38] The largest increases in insecurity occurred in Argentina, Ecuador, Brazil, and Mexico. However, an important distinction emerges: in Argentina and Ecuador, where consumer support measured in dollars increased (and in Ecuador, also as a percentage of expenditure), food insecurity may be starting to stabilize, even though these countries still have the highest levels. In contrast, in Brazil and Mexico, where consumer support has further decreased since the start of the pandemic, there are no signs that food insecurity is ceasing to grow.

38. There is no data available for Colombia.

FIGURE 43. SEVERE AND MODERATE FOOD INSECURITY IN RECENT YEARS IN SELECTED LAC COUNTRIES

(PERCENTAGE OF THE ADULT POPULATION)



Source: Own elaboration based on FAOSTAT data.

The previous discussion suggests, on a preliminary basis, that **consumer support may have helped mitigate the deterioration in food security caused by rising food prices.** The research agenda remains open to definitively determine whether this type of support was an effective policy (and to what extent) in moderating food inflation, thereby preventing further declines in the population's food security.

8. CONCLUSIONS

The agricultural sector has gone through a turbulent period in recent years. **The crisis generated by the COVID-19 pandemic affected supply chains and temporarily changed food demand patterns, leading to inflationary pressures.** This was compounded, starting in 2022, by the military conflict between Russia and Ukraine, which has also pushed food prices higher due to the scarcity of products originating from these countries, including fertilizers. At the same time, various natural phenomena (droughts, pests, wildfires, and tropical storms) have affected several countries, reducing their agricultural production. As a result, the food price index reported by the FAO increased by 60% until it reached its peak in March 2022, surpassing even the record of 2008 in nominal terms.

The agricultural sector in LAC is very heterogeneous and difficult to analyze in general terms. There are countries with large, productive, and export-oriented agricultural sectors, and others with the opposite characteristics. Brazil, Argentina, and Mexico account for 76% of agricultural production and 70% of exports; at the product level, only five (and their derivatives) represent 54% of exports. In fisheries, Peru, Chile, and Mexico account for 74% of marine catches, and 78% of aquaculture production comes from Chile, Ecuador, and Brazil. On the other hand, several Caribbean countries and some Central American nations are net food importers, with stagnant or declining agricultural production —along with their productivity levels— and their agricultural sectors have high GHG emissions per hectare (while their absolute contribution is low because they are small countries).

Just as production growth has been heterogeneous within the region, so has the increase in total factor productivity. In 10 of the 25 countries for which information is available, TFP fell during the period 2000-2020, and in another five, the average annual growth rate was below 0.5%. The rest of the countries show an average TFP growth rate of 1.8%. Overall, from 2011 to 2020, smaller increases in TFP were observed than in the previous decade.

The Agrimonitor database allows for the analysis of the agricultural sector and its public policies through the OECD Producer Support Estimate methodology. Despite the differences in characteristics and performance of the agricultural sector among LAC countries, there is greater homogeneity in terms of the levels of support for the agricultural sector: in general, supports represent a low percentage of their GDP (1.3%) and agricultural GDP (16%), compared to the EU, Canada, and the United States. The regional average indicates that **75% of the agricultural support comes from market price distortions.** Additionally, in general, countries in the region invest few budgetary resources (in direct transfers to producers or in general services for the sector).

In this regard, the **public agricultural expenditure represents 5% of agricultural GDP.** It has been observed that in 17 LAC countries, the average budgetary investment in the last three years for which data is available is lower than that made in the previous three years. This situation is concerning, given the importance of public goods for the development of the sector. Specific literature, such as Anriquez (2016) or FAO (2021), has shown that

DESPITE THE DIFFERENCES IN CHARACTERISTICS AND PERFORMANCE OF THE AGRICULTURAL SECTOR AMONG COUNTRIES IN LAC, THERE IS GREATER HOMOGENEITY IN TERMS OF SUPPORT LEVELS FOR THE AGRICULTURAL SECTOR: THE SUPPORT REPRESENTS A LOW PERCENTAGE OF THEIR GDP (1.3%) AND AGRICULTURAL GDP (16%), COMPARED TO THE EU, CANADA, AND THE UNITED STATES

countries in the region need to invest more resources in these types of supports to provide the conditions for higher levels of productivity and competitiveness.

At the same time, **countries in the region base their public policies on instruments that keep domestic prices of agricultural products at levels above internationally competitive prices.** The flip side of this coin is that consumers pay higher prices for food, which is reflected in negative levels of consumer support (a phenomenon present in almost all countries in the region). This represents a challenge for the food security of the population.

In this sense, it is important to highlight **the countries' reactions to the increase in food prices.** Food insecurity in the region has been on the rise since 2014 (at a faster pace than the global average), and data suggests that this is due to a decrease in economic access to food (due to price increases and falling incomes) rather than lower availability. The measures implemented to contain price increases were mostly temporary, and it will be necessary to analyze their causal effect on the levels of food insecurity in the population. The analysis carried out in this study, although limited by the availability of information, indicates that increases in support for consumers, through the reduction of policy measures that raise the domestic prices of agri-food products, may have helped mitigate growing food insecurity.

It is also important to highlight that in recent years **some countries have focused more on supporting small-scale and low-income producers.** Likewise, efforts to promote environmental sustainability through policies encouraging the adoption of sustainable practices and technologies have been observed. It will be important to carefully monitor the evolution of these policies and their effects on the environment. In this regard, Agrimonitor data shows that there is no clear relationship between the GHG emissions of agricultural products and the proportion of supports they receive.

Another relevant sector addressed in this work is fisheries and aquaculture. **Aquaculture in LAC has experienced an annual growth rate of 7.5% over the past 20 years,** and as a net exporting region of fishery products, these exports have grown at an average of 6% annually since 2000. The main exporters in the region —Chile, Ecuador, and Peru— face very few shipment rejections relative to the quantity they export.

PUBLIC AGRICULTURAL EXPENDITURE REPRESENTS 5% OF AGRICULTURAL GDP. IT HAS BEEN OBSERVED THAT IN 17 COUNTRIES IN LAC, THE AVERAGE BUDGETARY INVESTMENT IN THE LAST THREE YEARS FOR WHICH DATA IS AVAILABLE IS LOWER THAN THAT MADE IN THE PREVIOUS THREE YEARS

Regarding the **Estimate of Support to Fisheries,** it shows very different levels among the surveyed countries, in terms of its magnitude and composition. Argentina, the Bahamas, Colombia, and Peru provide the majority of support through investment in general services, while Costa Rica, Brazil, and Suriname provide support directly to their fishermen. At the same time, infrastructure programs are recorded in only four countries, and there is a need to allocate more resources to research and development in the fisheries and aquaculture sector of the region.

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APPENDIX 1

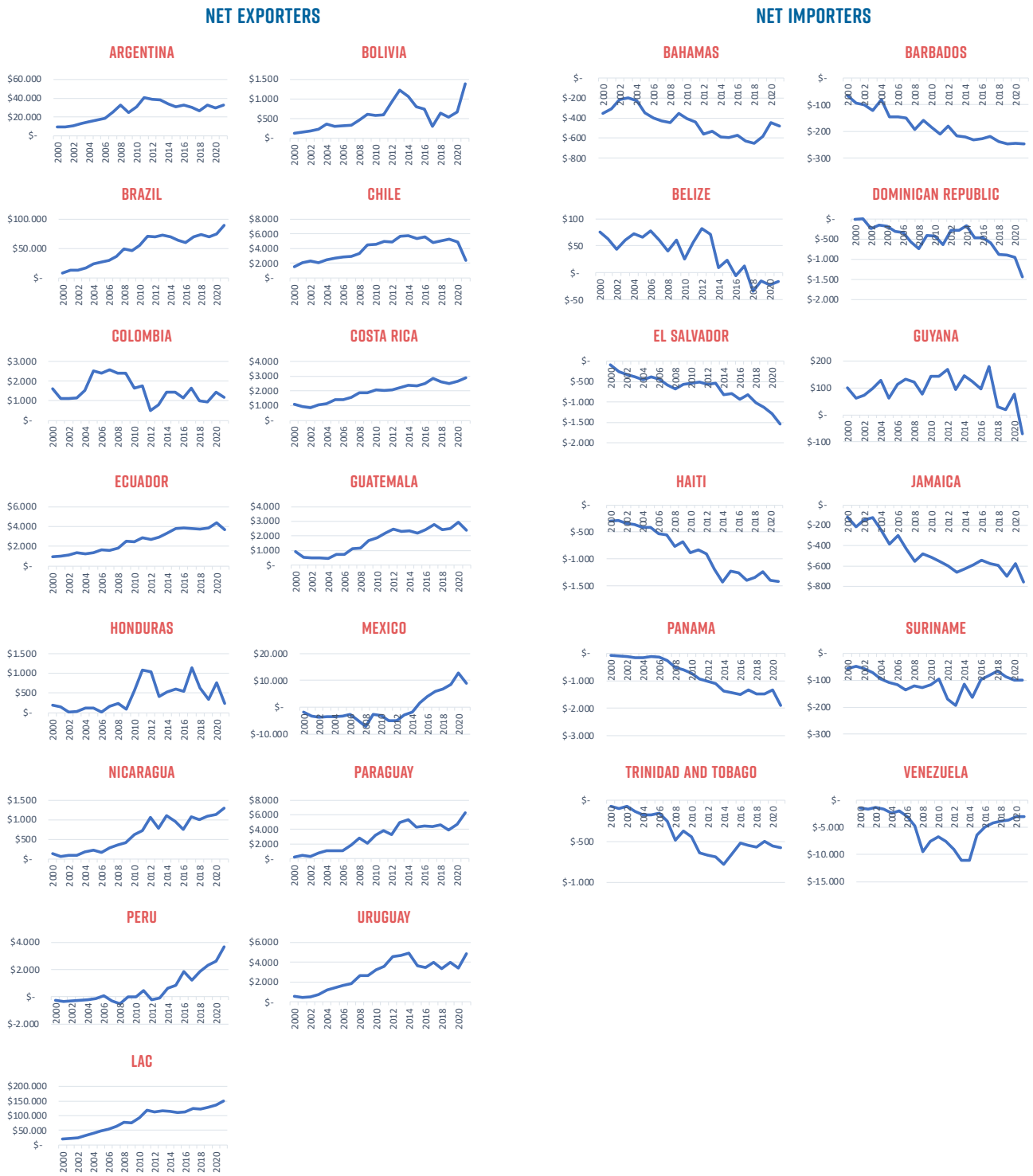
TABLE 11. AVAILABILITY OF INFORMATION IN THE AGRIMONITOR DATABASE

COUNTRY	SUPPORT FOR THE AGRICULTURAL SECTOR	GHG EMISSIONS	SUPPORT FOR FISHERIES AND AQUACULTURE
ARGENTINA	1997 TO 2021	N.D.	2010 TO 2018
BAHAMAS	2010 TO 2014	N.D.	2010 TO 2015
BARBADOS	2011 TO 2014	N.D.	N.D.
BELIZE	2011 TO 2014	N.D.	N.D.
BOLIVIA	2006 TO 2018	N.D.	N.D.
BRAZIL	1995 TO 2021	N.D.	2012 TO 2018
CHILE	1990 TO 2021	N.D.	2010 TO 2018
COLOMBIA	1992 TO 2021	N.D.	2010 TO 2018
COSTA RICA	1995 TO 2021	N.D.	2010 TO 2018
ECUADOR	2006 TO 2021	2017 TO 2021	2017 TO 2021
EL SALVADOR	2009 TO 2017	2013 TO 2017	N.D.
GUATEMALA	2006 TO 2018	2011 TO 2018	N.D.
GUYANA	2010 TO 2019	2015 TO 2019	N.D.
HAITI	2006 TO 2012	N.D.	N.D.
HONDURAS	2011 TO 2017	2013 TO 2017	2013 TO 2017
JAMAICA	2006 TO 2019	2006 TO 2019	N.D.
MEXICO	1986 TO 2021	N.D.	2010 TO 2018
NICARAGUA	2009 TO 2017	N.D.	N.D.
PANAMA	2010 TO 2019	N.D.	N.D.
PARAGUAY	2007 TO 2018	N.D.	N.D.
PERU	2010 TO 2018	N.D.	2012 TO 2018
DOMINICAN REPUBLIC	2006 TO 2019	2006 TO 2019	N.D.
SURINAME	2006 TO 2018	2015 TO 2018	2015 TO 2018
TRINIDAD AND TOBAGO	2010 TO 2015	N.D.	N.D.
URUGUAY	2009 TO 2020	N.D.	N.D.
VENEZUELA	N.D.	N.D.	N.D.
CANADA	1986 TO 2021	N.D.	2010 TO 2018
UNITED STATES	1986 TO 2021	N.D.	2010 TO 2018
EUROPEAN UNION	1986 TO 2021	N.D.	N.D.

Note: 'n.d.' indicates that no data is available.
Source: own elaboration.

FIGURE 44. EVOLUTION OF NET EXPORTS AND IMPORTS OF LAC COUNTRIES

(PERIOD 2000-2021)



Source: own elaboration based on WDI data (World Bank).

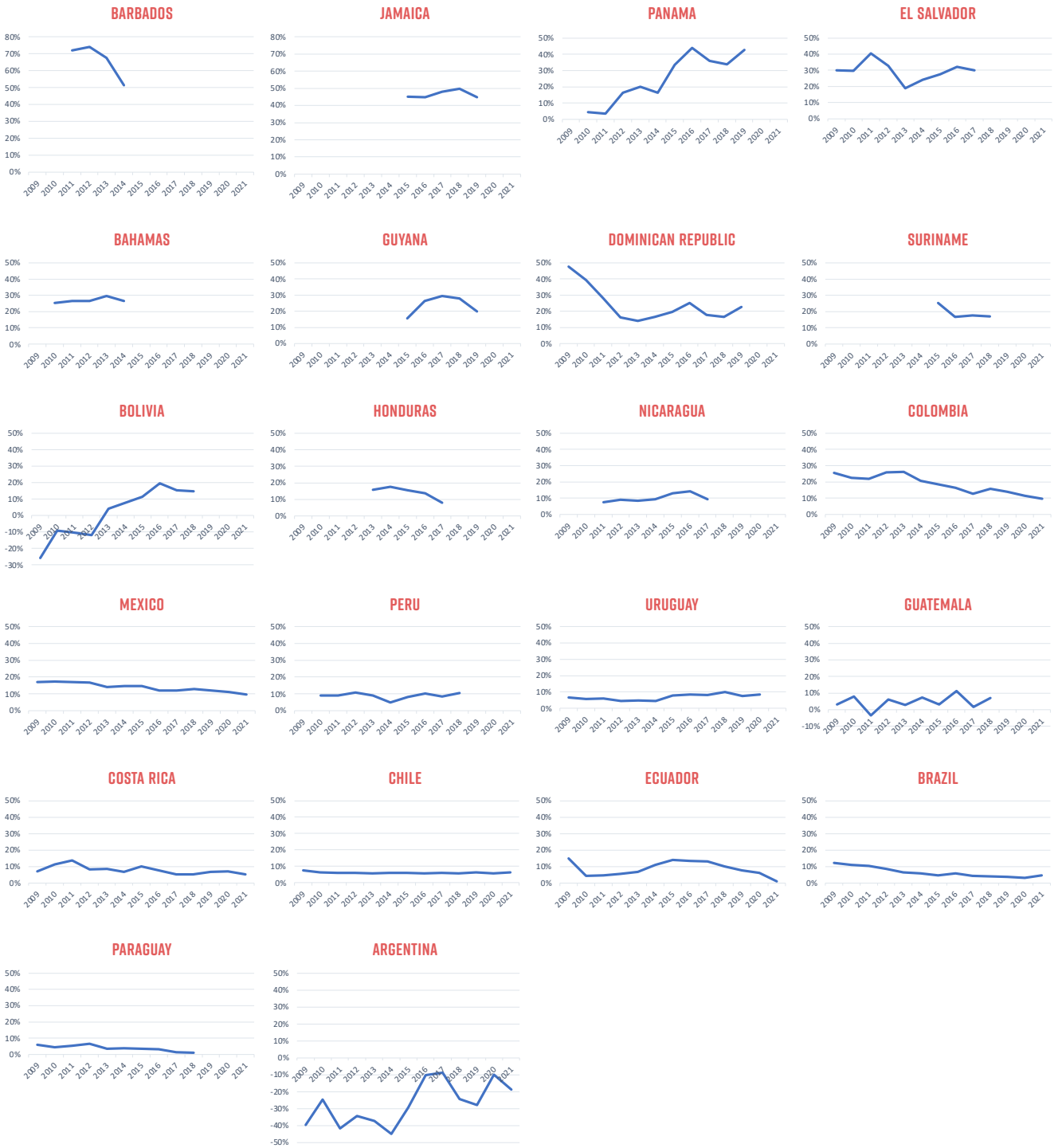
TABLE 12. PERFORMANCE INDICATORS OF THE AGRICULTURAL SECTOR (AVERAGE 2017-2021)

	MAIN TRANSACTIONS (50% OF EXPORTS)					TOTAL TRANSACTIONS (100% OF EXPORTS)												
	NUMBER OF COUNTRIES	NUMBER OF HIGH-INCOME COUNTRIES	NUMBER OF PRODS.	NUMBER OF PRODS. TO HIGH-INCOME COUNTRIES	% OF VALUE TO HIGH-INCOME COUNTRIES	NUMBER OF COUNTRIES	NUMBER OF HIGH-INCOME COUNTRIES	NUMBER OF PRODS.	NUMBER OF PRODS. TO HIGH-INCOME COUNTRIES	% OF VALUE TO HIGH-INCOME COUNTRIES	PRODUCTS IN THE GLOBAL TOP 5	AGRICULTURAL GDP		NET EXPORTS		EXPORTS	IMPORTS	TFP INDEX	PRODUCTION INDEX
	#	#	#	#	%	#	#	#	#	%	#	MILLIONS US$	% OF GDP	MILLIONS US$	% OF GDP	% OF GDP	% OF GDP	D% 00-04 A 17-21	
ARGENTINA	19	6	7	3	15%	147	39	204	118	23%	#	$27,935	5.7%	$33,179	122%	138%	16%	9%	51%
BAHAMAS	1	1	2	1	89%	21	11	33	25	88%	0	$78	0.7%	$-508	-610%	113%	723%	7%	46%
BARBADOS	6	4	2	1	85%	49	19	125	68	54%	0	$70	1.4%	$-238	-341%	196%	538%	N.D.	-13%
BELIZE	2	2	2	2	94%	57	24	78	47	73%	0	$176	7.6%	$156	89%	212%	124%	-35%	6%
BOLIVIA	3	0	3	0	3%	76	31	113	75	22%	5	$4,864	12.4%	$705	14%	31%	17%	19%	83%
BRAZIL	16	6	9	5	15%	189	39	351	328	27%	41	$93,251	5.3%	$81,859	89%	103%	14%	58%	72%
CHILE	15	8	19	14	54%	153	39	261	200	52%	20	$11,268	4.0%	$14,628	130%	203%	73%	40%	37%
COLOMBIA	8	8	4	4	100%	155	38	243	182	79%	4	$21,186	6.8%	$520	3%	37%	34%	10%	37%
COSTA RICA	10	6	7	5	82%	113	37	251	143	67%	8	$2,770	4.4%	$2,568	93%	186%	93%	0%	44%
DOMINICAN REP.	3	3	5	5	98%	112	38	271	245	81%	3	$4,686	5.5%	$-954	-20%	54%	74%	46%	77%
ECUADOR	10	4	4	3	51%	126	38	202	168	54%	6	$9,728	9.3%	$9,370	96%	124%	27%	22%	27%
EL SALVADOR	8	2	9	6	39%	68	26	199	99	35%	0	$1,366	5.2%	$-1,217	-89%	82%	171%	10%	11%
GUATEMALA	14	6	13	10	73%	120	35	266	158	56%	13	$7,369	9.6%	$2,390	33%	80%	48%	41%	85%
GUYANA	5	2	3	2	30%	62	21	145	109	44%	4	$987	18.0%	$150	15%	45%	30%	-21%	46%
HAITI	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	1	$3,213	19.6%	N,D,	-41%	2%	43%	12%	28%
HONDURAS	6	6	4	4	100%	90	34	183	125	79%	3	$2,891	11.6%	$3,178	110%	197%	87%	2%	56%
JAMAICA	3	3	9	9	100%	72	25	199	158	83%	5	$1,110	7.5%	$-764	-69%	35%	104%	0%	6%
MEXICO	1	1	12	12	100%	113	34	273	257	92%	39	$42,895	3.6%	$5,774	14%	87%	73%	23%	45%
NICARAGUA	6	3	6	4	75%	103	38	186	105	58%	6	$2,045	15.4%	$1,362	67%	126%	60%	37%	98%
PANAMA	8	2	5	4	60%	82	28	157	63	46%	0	$1,639	2.5%	$4,086	260%	418%	158%	-4%	34%
PARAGUAY	5	1	4	0	3%	117	32	125	79	17%	9	$4,118	10.7%	$4,781	115%	143%	27%	58%	114%
PERU	9	6	12	10	90%	131	39	272	226	75%	14	$15,394	7.1%	$5,072	33%	70%	37%	28%	93%
SURINAME	2	0	3	0	2%	41	13	58	36	22%	2	$330	9.4%	$-68	-21%	48%	69%	15%	47%
TRINIDAD AND TOBAGO	9	2	8	2	14%	59	21	242	176	16%	2	$242	1.0%	$-609	-255%	171%	427%	-50%	-18%
URUGUAY	7	2	8	1	16%	124	34	204	143	23%	7	$3,945	6.4%	$4,843	123%	159%	35%	-16%	48%
VENEZUELA	5	2	4	2	21%	44	16	63	39	37%	1	$19,713	5.1%	N,D,	-17%	1%	18%	-19%	-6%

Note: "Transaction" refers to the value exported by country A of good X to country Y in a specific year. For instance, Colombian coffee exports to the United States in the year 2010 represent one "transaction," while Colombian banana exports to the United States in the same year represent another "transaction." Defined this way, these transactions can be arranged from highest to lowest for analysis.

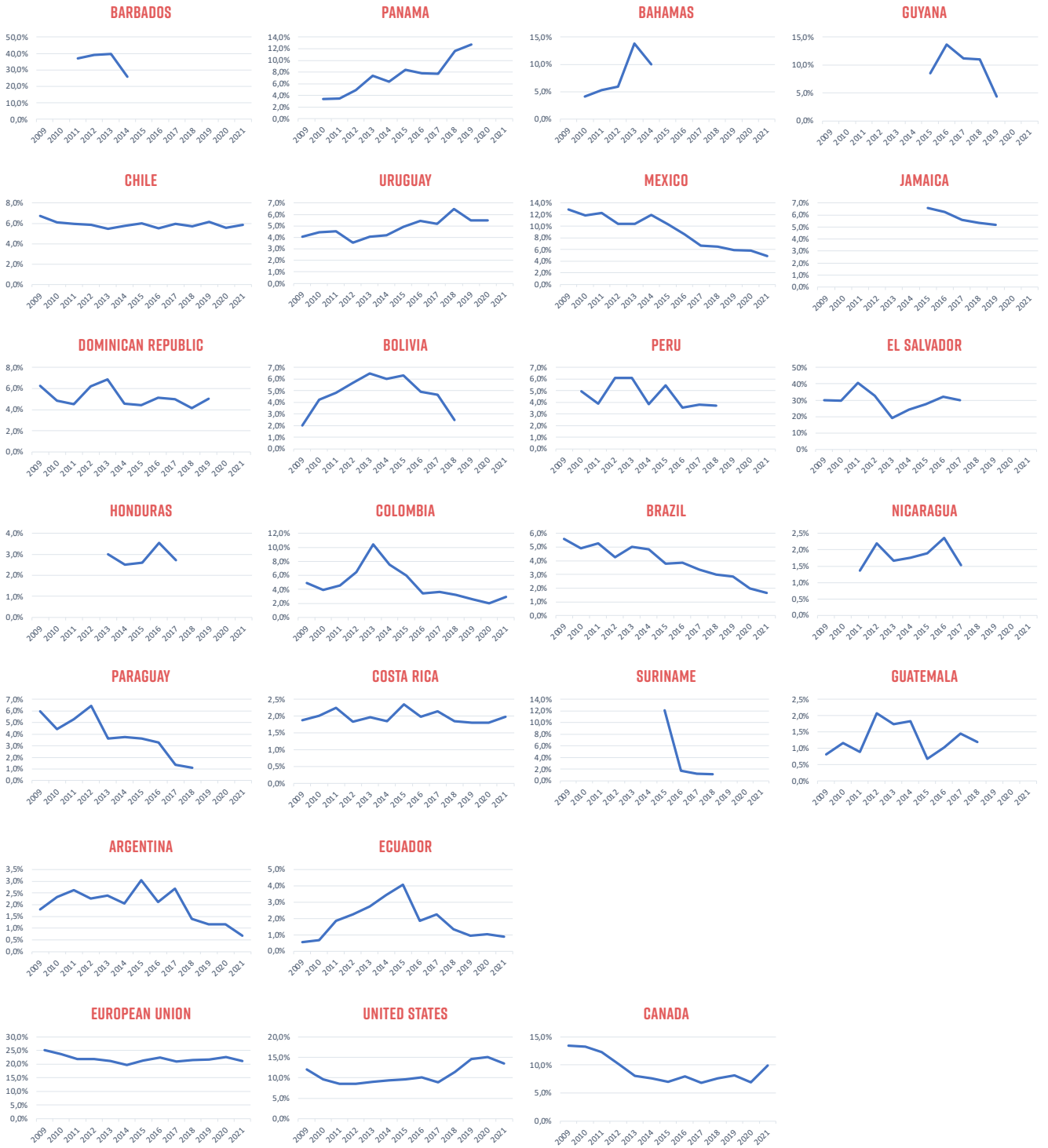
Sources: Own elaboration based on data from FAOSTAT, WDI of the World Bank, USDA-ERS, and FAO.

FIGURE 45. EVOLUTION OF TOTAL SUPPORT TO THE SECTOR AS A PERCENTAGE OF AGRICULTURAL GDP



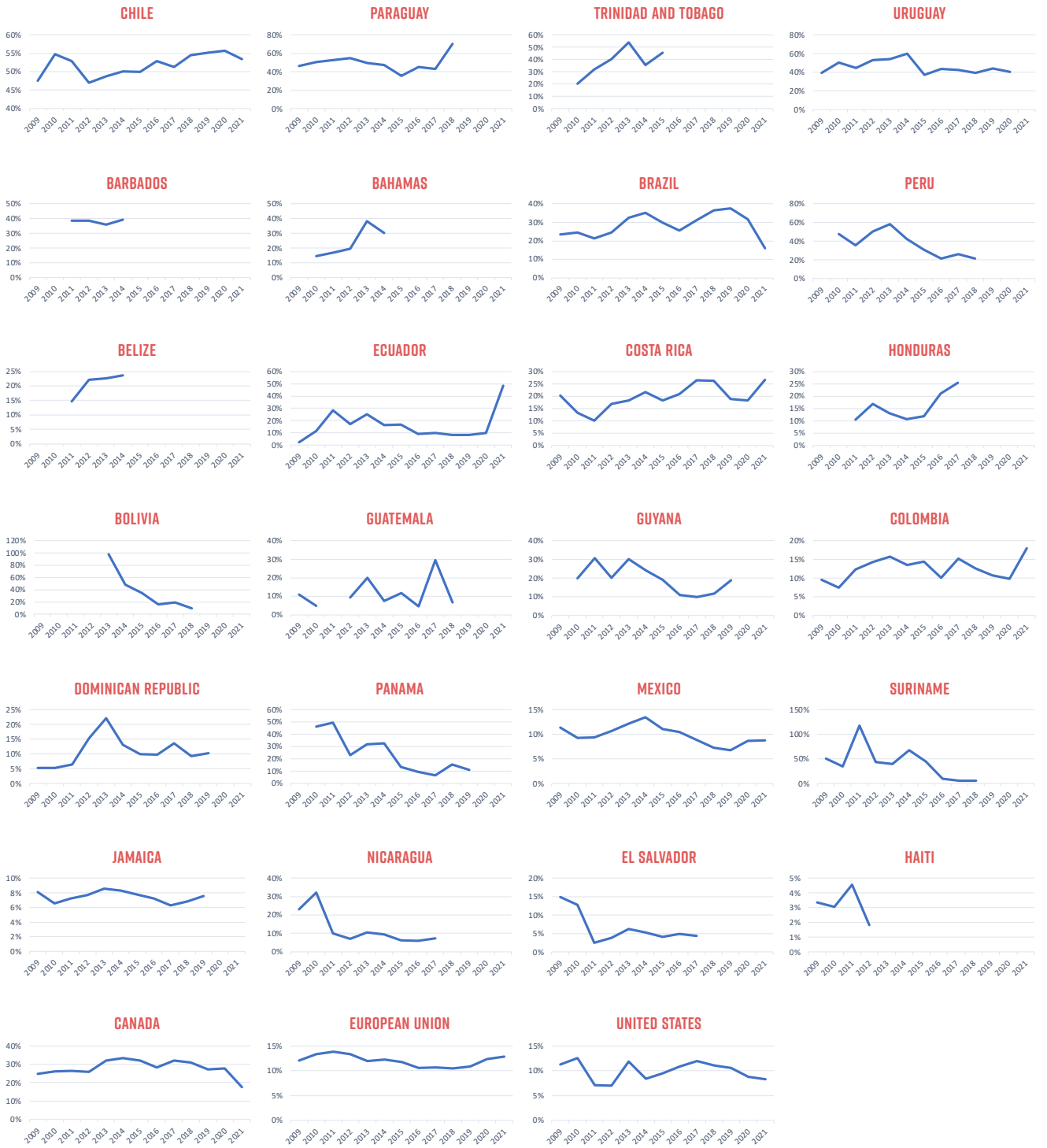
Note: The countries are ordered based on the average of the last three available years, from highest to lowest (as presented in Figure 8, panel b).
The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

FIGURE 46. EVOLUTION OF AGRICULTURAL PUBLIC EXPENDITURE AS A PERCENTAGE OF THE SECTOR'S GDP



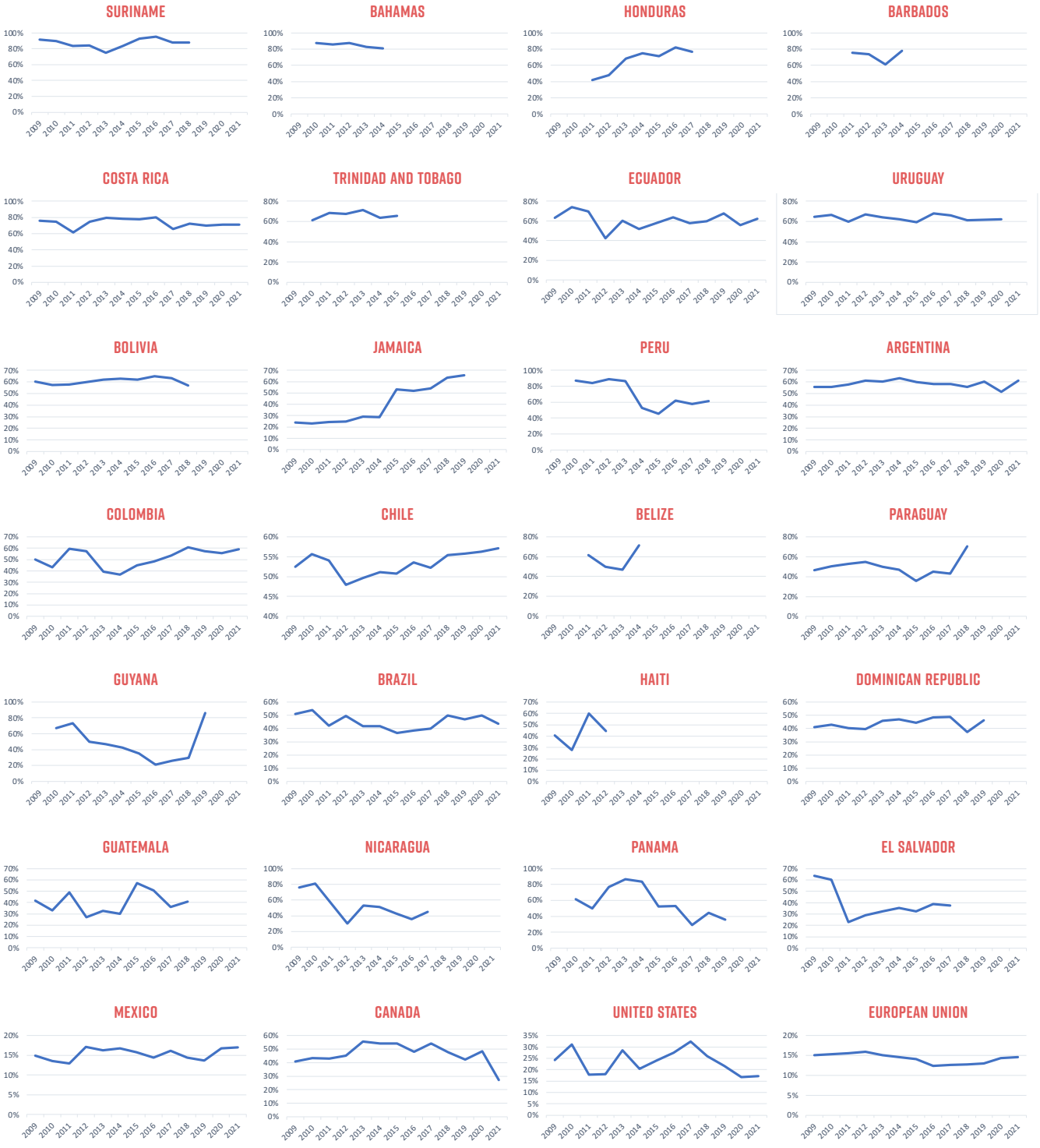
Note: The countries are ordered based on the average of the last three available years, from highest to lowest (as presented in Figure 9).
The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

FIGURE 47. EVOLUTION OF SUPPORT THROUGH GENERAL SERVICES AS A PERCENTAGE OF TSE



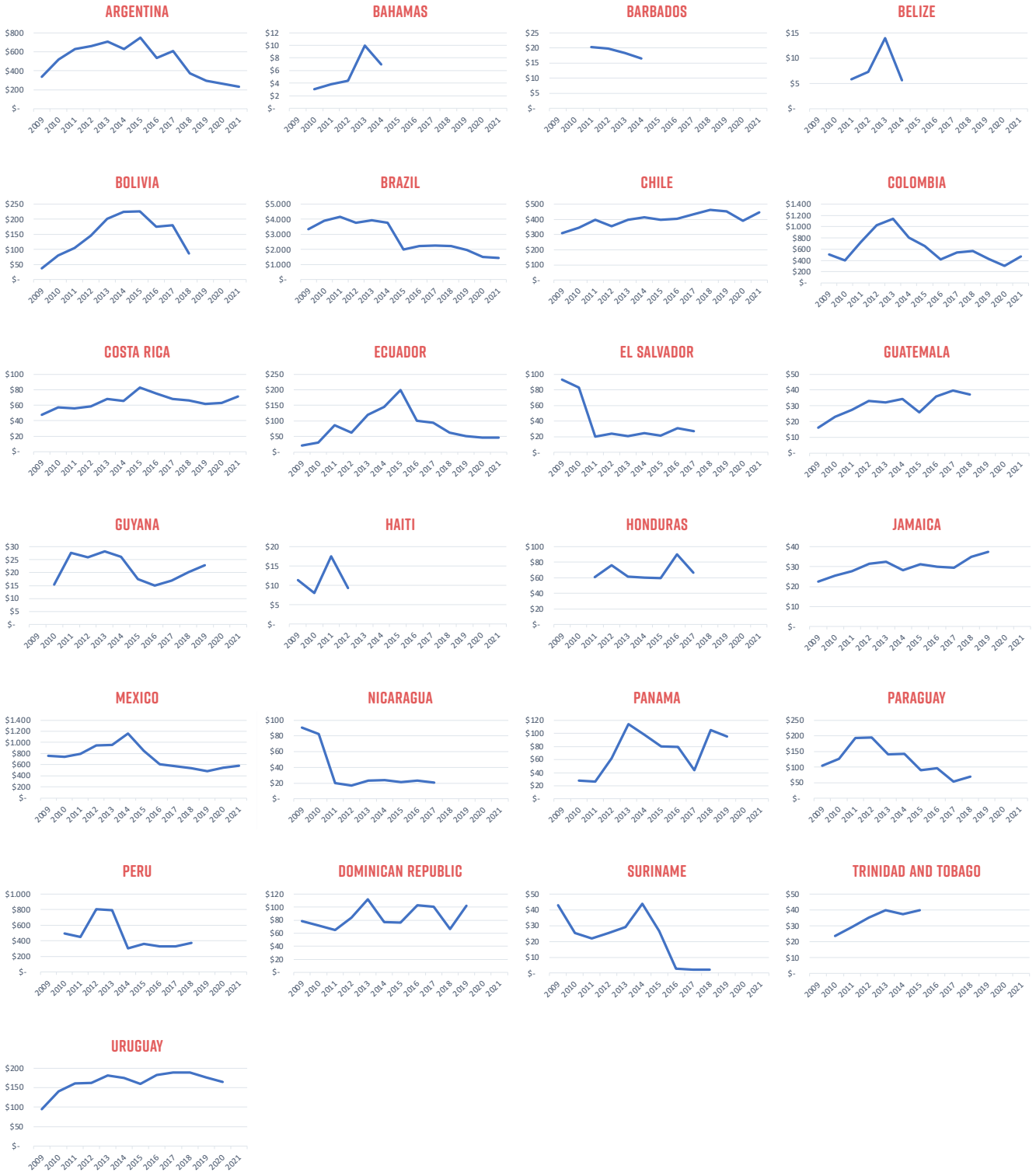
Note: The countries are ordered based on the average of the last three available years, from highest to lowest (as presented in Figure 10, panel a). The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

FIGURE 48. EVOLUTION OF SUPPORT THROUGH GENERAL SERVICES AS A PERCENTAGE OF TBSE



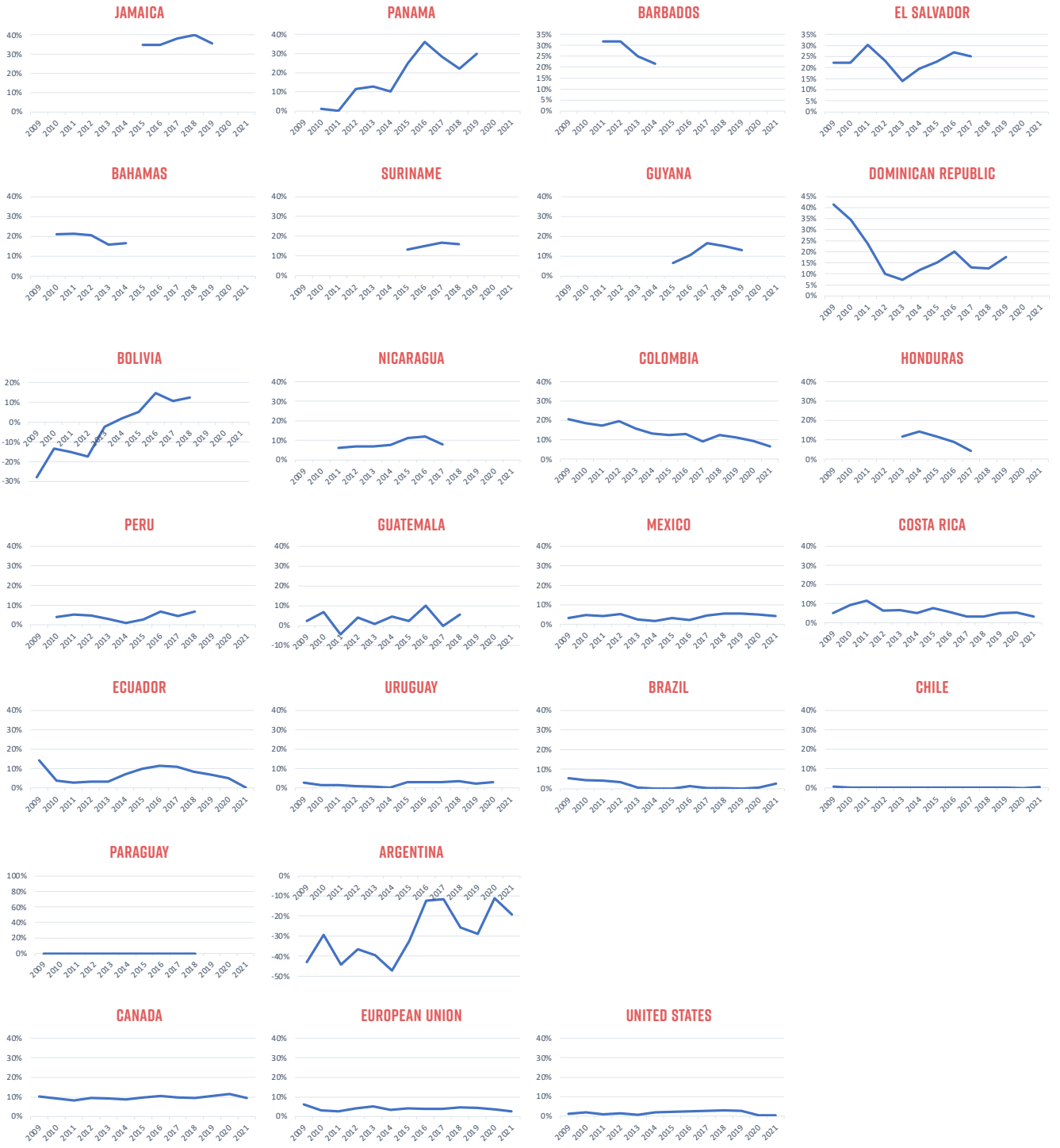
Note: The countries are ordered based on the average of the last three available years, from highest to lowest (as presented in Figure 10, panel b). The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

FIGURE 49. EVOLUTION OF SUPPORT THROUGH GENERAL SERVICES IN MILLIONS OF DOLLARS



Source: Own elaboration based on Agrimonitor data.

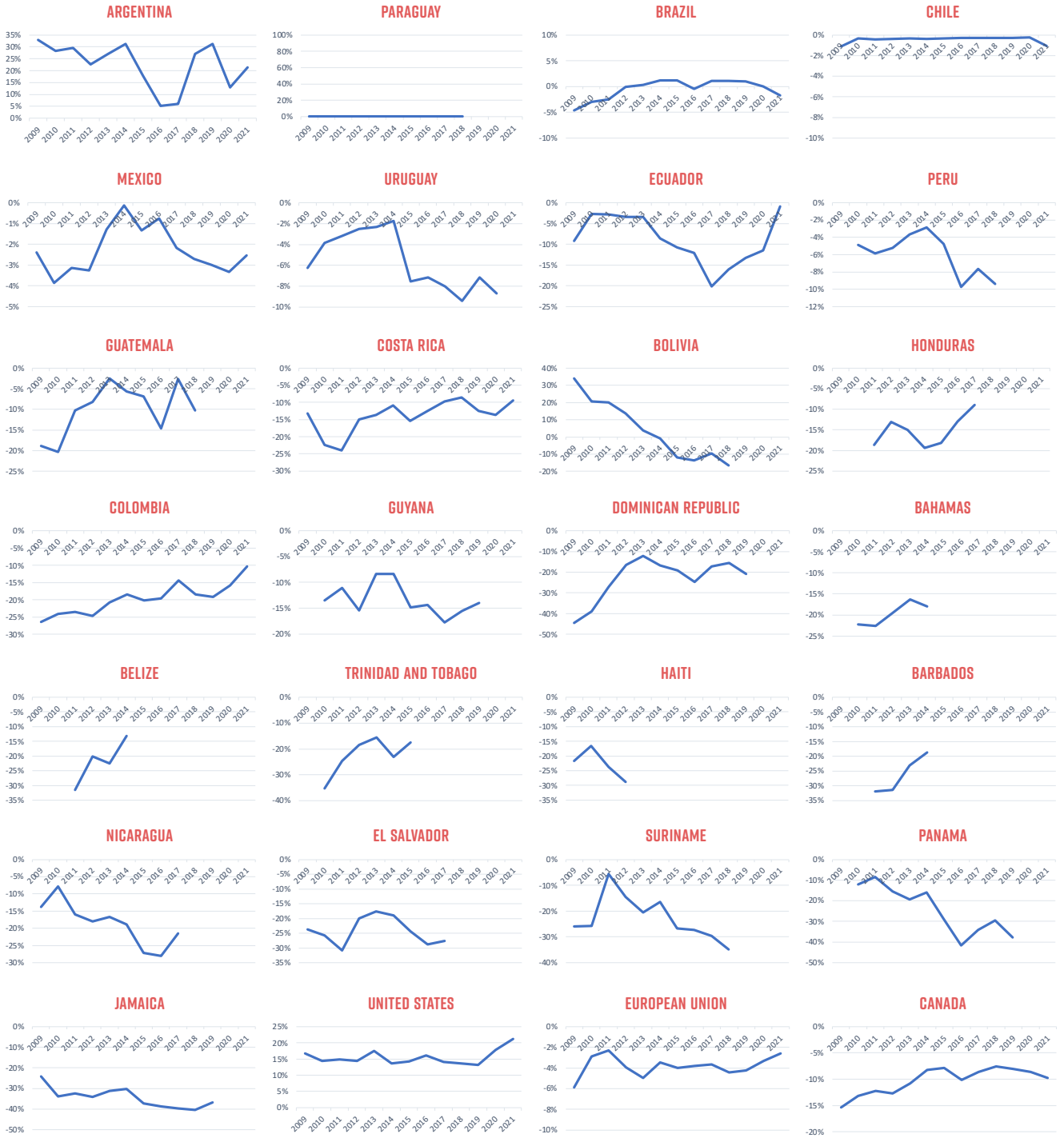
FIGURE 50. EVOLUTION OF MARKET PRICE SUPPORT AS A PERCENTAGE OF AGRICULTURAL GDP



Note: The countries are ordered based on the average of the last three available years, from highest to lowest.
The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

FIGURE 51. EVOLUTION OF CONSUMER SUPPORT AS A PERCENTAGE OF CONSUMPTION EXPENDITURE

(NET OF TAXPAYER TRANSFERS)



Note: The countries are ordered based on the average of the last three available years, from highest to lowest (as presented in Figure 15). The red line indicates the location of the average for LAC.
Source: Own elaboration based on Agrimonitor data.

APPENDIX 2

Figure 52 summarizes the observed trend for each country for each of the variables discussed during the period 2009-2021 (or the available sub-period). In each column, the countries are ordered according to the value of the average for the last three available years, and when a group of adjacent countries shows a similar trend, they are enclosed in a square of the corresponding color.

FIGURE 52. GENERAL TRENDS IN AGRICULTURAL SUPPORT MEASURES (AVERAGE OF THE LAST THREE AVAILABLE YEARS FOR EACH COUNTRY)

TSE (% AgrGDP)		MPS (% AgrGDP)		TBSE (% AgrGDP)		GSSE (% TBSE)		GSSE (% TSE)		PSE (% AgrIncome)		CSE (% cons)	
BAR	↘	JAM	--	BAR	↘	SUR	→	CHI	↗	JAM	↗	ARG	--
JAM	--	PAN	↗	PAN	↗	BAH	↘	PAR	↗	BAR	↘	PAR	→
PAN	↗	BAR	↘	BAH	↗	HON	↗	TYT	↗	PAN	↗	BRA	↗
ELS	↗	ELS	↗	GUY	↘	BAR	--	URU	→	ELS	↗	CHI	→
BAH	--	BAH	--	CHI	→	CRI	→	BAR	→	TYT	↗	MEX	↘
GUY	--	SUR	↗	URU	↗	TYT	→	BAH	↗	HAI	--	URU	↗
RDO	↗	GUY	--	MEX	↘	ECU	→	BRA	↗	BAH	↘	ECU	↗
SUR	--	RDO	↗	JAM	↘	URU	→	PER	↘	GUY	--	PER	↘
BOL	↗	BOL	↗	RDO	→	BOL	→	BEL	↗	RDO	↗	GUA	--
HON	↘	NIC	↗	BOL	↘	JAM	↗	ECU	--	SUR	↗	CRI	↗
NIC	↗	COL	↘	PER	→	PER	↗	CRI	↗	BOL	↗	BOL	↘
COL	↘	HON	↘	ELS	↗	ARG	→	HON	↗	NIC	↗	HON	↗
MEX	↘	PER	↗	HON	--	COL	↗	BOL	↘	BEL	--	COL	↗
PER	↗	GUA	--	COL	↘	CHI	↗	GUA	--	COL	↘	GUY	--
URU	↗	MEX	→	BRA	↘	BEL	--	GUY	--	MEX	↘	RDO	→
GUA	--	CRI	→	NIC	→	PAR	↗	COL	--	HON	↘	BAH	↗
CRI	↗	ECU	↘	PAR	↘	GUY	--	RDO	→	PER	↗	BEL	↗
CHI	→	URU	→	CRI	→	BRA	→	PAN	↘	GUA	--	TYT	↗
ECU	↘	BRA	→	SUR	↗	HAI	--	MEX	↗	URU	→	HAI	↘
BRA	↘	CHI	→	GUA	--	RDO	→	SUR	↘	CRI	↗	BAR	↗
PAR	↘	PAR	→	ARG	↘	GUA	--	JAM	→	ECU	↘	NIC	↘
ARG	↗	ARG	↗	ECU	↘	NIC	→	NIC	→	CHI	→	ELS	↘
BEL	n.d.	BEL	n.d.	BEL	n.d.	PAN	↘	ELS	→	BRA	↗	SUR	↘
HAI	n.d.	HAI	n.d.	HAI	n.d.	ELS	↗	HAI	↗	PAR	↘	PAN	↘
TYT	n.d.	TYT	n.d.	TYT	n.d.	MEX	→	ARG	n.d.	ARG	↗	JAM	↘

Note: The colors of the arrows are solely for visualization purposes; they do not indicate any value judgment. White arrows indicate that the trend is less pronounced than in the case of colored arrows. "--" means that no trend can be determined, either because the series is very volatile or because the latest observations could indicate a new trend. In general, an effort has been made to indicate the trend throughout the series. When this has not been possible due to marked changes in the series, the trend has been indicated in the most recent sub-period of at least four years. "n.d." means that no data is available. The rows shaded in gray indicate countries for which the data is particularly outdated. The red lines indicate the average location for LAC. Source: Own elaboration.

Figure 53 presents information similar to that of Figure 52, but this time organized by country. The color of the cells provides an idea of the relative position of the country compared to the other countries: green shades indicate that the country is below the regional average, while blue shades indicate the opposite; the darker the color, the further the country is from the average.

FIGURE 53. OBSERVED TRENDS FOR EACH COUNTRY

Country	Period	TSE (% AgrGDP)	MPS (% AgrGDP)	TBSE (% AgrGDP)	GSSE (% TBSE)	PSE (%AgrIncome)	CSE (% cons)
Colombia	2009 - 2021	↘	↘	↘	↗	↘	↗
Honduras	2011 - 2017	↘	↘	--	↗	↘	↗
Ecuador	2009 - 2021	↘	↘	↘	→	↘	↗
Paraguay	2009 - 2018	↘	→	↘	↗	↘	→
Brazil	2009 - 2021	↘	→	↘	→	↘	↘
Mexico	2009 - 2021	↘	→	↘	→	↘	↘
Costa Rica	2009 - 2021	↘	→	→	→	↘	↗
Chile	2009 - 2021	→	→	→	↗	→	→
Uruguay	2009 - 2020	↗	→	↗	→	→	↘
Nicaragua	2009 - 2017	↗	↗	→	→	↗	↘
Peru	2010 - 2018	↗	↗	→	↗	↗	↘
Dominican Republic	2009 - 2019	↗	↗	→	→	↗	→
Bolivia	2009 - 2018	↗	↗	↘	→	↗	↘
Suriname	2009 - 2018	--	↗	↘	→	↗	↘
El Salvador	2009 - 2017	↗	↗	↗	↗	↗	↘
Panama	2010 - 2019	↗	↗	↗	↘	↗	↘
Argentina	2009 - 2021	↗	↗	↘	→	↗	--
Guatemala	2009 - 2018	--	--	--	--	--	--
Guyana	2010 - 2019	--	--	↘	--	--	--
Jamaica	2009 - 2019	--	--	↘	↗	↗	↘
Barbados	2011 - 2014	↘	↘	↘	--	↘	↗
Bahamas	2010 - 2014	--	--	↗	↘	↘	↗
Belize	2011 - 2014	n.d.	n.d.	n.d.	--	--	↗
Haiti	2009 - 2012	n.d.	n.d.	n.d.	--	--	↘
Trinidad and Tobago	2009 - 2015	n.d.	n.d.	n.d.	→	↘	↗

Note: The colors of the arrows are solely for visualization purposes; they do not indicate any value judgment. White arrows indicate that the trend is less pronounced than in the case of colored arrows. "--" means that no trend can be determined, either because the series is very volatile or because the latest observations could indicate a new trend. In general, an effort has been made to indicate the trend throughout the series. When this has not been possible due to marked changes in the series, the trend has been indicated in the most recent sub-period of at least four years. The arrows do not indicate the magnitude or strength of the trend. "n.d." means that no data is available. Countries whose names are shaded in gray indicate that their data is outdated. The colors of the cells indicate the relative position of the country compared to the other countries in LAC: green indicates that the country is below average in the corresponding indicator, and blue indicates the opposite; the darker the color, the further the country is from the average. Source: Own elaboration.

While Figure 53 aims to provide a quick overview of each country's trends in terms of their agricultural support policies, Figure 54 condenses this information by identifying common general patterns. Countries whose information is outdated or does not allow for identifying general trends are not included.

FIGURE 54. GENERAL PATTERNS OF AGRICULTURAL POLICY TRENDS

Group	Country	Period	TSE (%AgrGDP)	MPS (%AgrGDP)	TBSE (%AgrGDP)	GSSE (%TBSE)	BPP (%TBSE)	PSE (% AgrIncome)	CSE (% cons)
1	Colombia	2009 - 2021							
	Honduras	2011 - 2017							
	Ecuador	2009 - 2021							
2	Paraguay	2009 - 2018							
	Brazil	2009 - 2021							
	Mexico	2009 - 2021							
3	Costa Rica	2009 - 2021							
	Chile	2009 - 2021							
4	Nicaragua	2009 - 2017							
	Peru	2010 - 2018							
5	Dom. Republic	2009 - 2019							
	Bolivia	2009 - 2018							
6	Suriname	2009 - 2018	--						
7	Jamaica	2009 - 2019	--	--					
8	El Salvador	2009 - 2017							
	Panama	2010 - 2019							
9	Uruguay	2009 - 2020							
10	Argentina	2009 - 2021							--

Note: The colors of the arrows are solely for visualization purposes; they do not indicate any value judgment. White arrows indicate that the trend is less pronounced than in the case of colored arrows. "--" means that no trend can be determined because the series is very volatile. The colors of the cells indicate the relative position (of the country or group of countries) compared to the rest of LAC: green indicates a position below the average for the corresponding indicator, and blue indicates the opposite; the darker the color, the further it is from the average. The arrows (trends) and cell colors (relative position) should be interpreted as an average of the individual arrows and cell colors for each country. Source: Own elaboration.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