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Cuba's Deteriorating Food Security and Its Implications for U.S. Agricultural Exports

Steven Zahniser, Lila Cardell, Yacob Abrehe Zereyesus, and Constanza Valdes

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Abstract

Cuba's economy, which has been struggling since 2016 and fared poorly during the Coronavirus (COVID-19) pandemic, has been unable to achieve a strong, sustained recovery and continues to face lower tourism revenues, decreased agricultural output, energy shortages, and double-digit inflation. This continuing economic downturn has limited Cuba's ability to import agricultural products and weakened the country's ability to produce its own food, thereby worsening food security in Cuba. To assess the extent of this problem, researchers at the U.S. Department of Agriculture (USDA), Economic Research Service (ERS) used the International Food Security Assessment (IFSA) model. Results indicated that an estimated 12.8 percent (1.4 million people) in Cuba did not meet the daily threshold of 2,100 calories per capita in 2023. Due to uncertainties regarding the measurement of Cuba's Gross Domestic Product (GDP), the researchers considered a scenario with adjusted GDP per capita (based on the average GDP per capita for the Caribbean subregion) and estimated that 37.8 percent of the population (4.2 million people) was food insecure. Although Cuba's declining agricultural production has increased the need for agricultural imports, the country's ongoing challenges in earning foreign exchange through tourism, remittances, and exports limit its ability to do so. Under these circumstances, U.S. agricultural exports to Cuba increased in 2021, 2022, and 2023 but were concentrated in a single commodity, chicken meat.

Keywords: Cuba, food security, agricultural production, agricultural trade, remittances, and tourism

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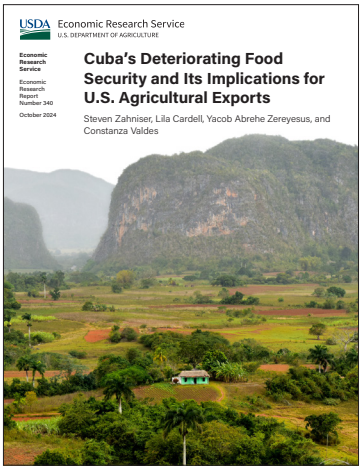
What Is the Issue?



Cuba's economy continues to struggle following the Coronavirus (COVID-19) pandemic. Reductions in trade, tourism, remittances, and domestic food production have contributed to growing food insecurity in Cuba, although higher levels of Cuba-Russia trade have provided some respite. The deterioration in Cuba's food security has direct implications for the overall levels and product composition of U.S. agricultural exports to Cuba, which historically has relied on some agricultural imports to meet the nutritional needs of Cuba's population.

What Did the Study Find?

Cuba's domestic production of many crops decreased substantially over the past 7 years, which is, in part, due to hurricanes and flooding in 2020 and 2021 and drought in 2023. Between marketing years 2016/17 and 2023/24, Cuba's annual corn production declined from 404,000 metric tons to 250,000 metric tons, a 38-percent decrease. Rice production fell from 335,000 metric tons to 140,000 metric tons (milled basis), a 58-percent decrease. In addition, Cuba's annual sugar exports (once an important source of foreign exchange that could be used to finance imports) plummeted from 1.1 million metric tons to 110,000 metric tons (raw value), a 90.5-percent decrease.

Because of lower domestic agricultural production, Cuba's ability to import food has assumed a more substantial role in the country's food security. The country's main agricultural imports are staple commodities, including chicken meat, wheat, and rice. This composition of imports reflects efforts to fulfill crucial dietary needs that cannot be satisfied by domestic production and to smooth variations in consumption across time through the periodic accumulation and depletion of stocks. Moreover, Cuba's current economic challenges make it difficult to earn the foreign exchange needed to import food or critical agricultural inputs, such as fuel and fertilizer.

Based on the USDA, Economic Research Service's (ERS) International Food Security Assessment (IFSA) model, nearly 12.8 percent (1.4 million people) of Cuba's population in 2023 was estimated to be food insecure. The food gap is defined as the difference between projected food demand and a caloric threshold of 2,100 kilocalories per capita per day.

For 2023, Cuba's average estimated food gap was 225 calories per capita per day or the equivalent to an annual food gap of approximately 41,000 metric tons (in grain equivalents) for Cuba's food insecure population. This level of food insecurity reflects high domestic food prices, which reduce household purchasing power, particularly for lower income households in which food accounts for a larger share of total expenditures.

Cuba's grain production (rice and corn mainly) has been declining since 2016, with fewer than 400,000 metric tons produced each year from 2020 to 2023, according to estimates by USDA's Foreign Agricultural Service. With an estimated food gap of 41,000 metric tons in 2023, Cuba has depended on imports to fill the gap. Due to uncertainties regarding the measurement of Cuba's Gross Domestic Product (GDP), a scenario with adjusted per capita GDP was considered. In this alternative scenario, an estimated 37.8 percent (4.2 million people) of Cuba's population may have been food insecure in 2023.

Among the countries for which data on trade with Cuba are available, the European Union (EU), the United States, and Brazil were the first, second, and third leading suppliers of Cuba's agricultural imports during 2017–22, respectively. The EU, China, and Switzerland were the first, second, and third leading destinations for Cuba's agricultural exports, respectively. In addition, Russia was reported to have donated 25,000 metric tons of wheat to Cuba in 2023.

After U.S. agricultural exports to Cuba plunged to $157 million in 2020, this trade rebounded to $299 million in 2021, $319 million in 2022, and $337 million in 2023. Chicken meat accounted for 89.4 percent of U.S. agricultural exports to Cuba during 2020–23. This pattern of relatively low exports concentrated in a single commodity directly contrasts with the pattern of trade in the aftermath of hurricanes that hit Cuba in 2001 and 2008. U.S. agricultural imports from Cuba have remained at or near zero since the early 1970s due to U.S. restrictions.

How Was the Study Conducted?

The authors drew upon publicly available information to profile Cuba's economy, food security, and agricultural trade. First, the authors analyzed economic and policy information, including GDP, population, exchange rates, inflation, number of foreign visitors, agricultural production, remittances, and foreign assistance, to develop an understanding of Cuba's economic situation and outlook. Second, the authors used the IFSA model to estimate the share of Cuba's population that was food insecure in 2023. Finally, the authors used trade data from the United States and other trade partners of Cuba to construct an overview of Cuba's agricultural trade. Missing from this analysis are several key trading partners of Cuba—Russia, Venezuela, and Vietnam—whose trade data are not fully reported. As a result, the available trade data may undercount Cuba's exports and imports.

Cuba's Deteriorating Food Security and Its Implications for U.S. Agricultural Exports

Introduction

Since 2019, Cuba has experienced a series of economic, political, and social challenges that add up to what many observers have called a "multidimensional crisis" or "multiple crises" (González, 2022; Muñoz Lima, 2023). Behind this crisis are multiple short-term and medium-term factors, including the Coronavirus (COVID-19) pandemic, adverse weather events, higher commodity prices, and the Russia-Ukraine war. These factors have contributed to lower domestic agricultural production and agricultural imports in Cuba and a deteriorating economic situation in general, thereby limiting Cuba's supply of food and increasing the prevalence of food insecurity in Cuba.

In response, the World Food Programme (WFP), a humanitarian organization within the United Nations that delivers emergency food assistance and works with communities on nutritional issues, has taken steps to assist Cuba with food security concerns. In 2022, WFP provided 3,412 metric tons of food commodities in support of Cuba's school feeding program, including food obtained from Cuba's agricultural cooperatives and smallholder farms. Following Hurricane Ian in 2022, WFP delivered in-kind emergency assistance to about 510,000 beneficiaries. The WFP also bought $10.7 million worth of various agricultural and food commodities, to be given to Cuba in support of the country's efforts to achieve the United Nations Sustainable Development Goal of No Hunger (WFP, 2023). In February 2024, WFP reported that it had received an official request from the Cuban Government for assistance to provide powdered milk to children younger than age 7. This followed an announcement by the Cuban Government that it had fallen behind in milk deliveries to children between the ages of 6 months and 2 years (Buschschlütter, 2024).

Cuba's difficult food security situation is also connected to the long-term features of its political economy. In particular, the limited presence of a market economy[1] in Cuba and U.S. restrictions on many forms of trade, travel, remittances, and investment with Cuba have made it difficult for the country to find a balance between domestic agricultural production and imports that satisfies the dietary requirements of the country's population. This deterioration of Cuba's food security has direct implications for U.S. agricultural exports to Cuba. Although limited growth in Cuban agricultural production has created opportunities for foreign suppliers, the general stagnancy of the Cuban economy has made it difficult for the country to reach income levels needed to purchase imports of any type, including U.S. agricultural products.

The Cuban Economy

Cuba is unique among Latin America and the Caribbean countries as the region's oldest socialist, centrally planned economy with state control over wholesale purchases, credit, international trade, and foreign investment. To secure the foreign exchange needed to pay for imports, Cuba has depended mainly on tourism and

[1] Investopedia (2024) defines a market economy as "a system in which production decisions and the prices of goods and services are guided primarily by the interactions of consumers and businesses. That is, the law of supply and demand, not a central government's policy, is allowed to determine what is available and at what price."

the export of healthcare services, nickel, zinc, and zinc products (United Nations, Economic Commission for Latin America and the Caribbean, 2021a; United Nations, Economic Commission for Latin America and the Caribbean, 2022a).[2] Cuba also has exported some agricultural products, including manufactured tobacco, rum and tafia,[3] and cane sugar. The agricultural sector, although open to independent farmers and private-sector cooperatives, has been characterized by low productivity, weak investment, and a precarious food distribution system (Gray, 2017).

As is the case for most centrally planned economies, food prices in Cuba are not entirely determined by the market forces of supply and demand or even by production costs. Since 1962, the Cuban Government has allocated food rations to its population at subsidized prices using a system of ration books (libretas) and Government-owned stores.[4] The cost of these subsidies represented 14.1 billion Cuban pesos in 2010 and 8.9 billion pesos in 2020 (Oficina Nacional de Estadística y Información (ONEI), 2021).[5] Even before the COVID-19 pandemic, however, these rations supplied only a portion of the food intake of Cuban households (Alvarez, 2004; Stark, 2023), and the search for food in Cuba typically has extended beyond the ration system to encompass formal and informal markets, gifts, and bartering (Stark, 2023).

Since 2019, Cuba's rationing system has shown additional signs of stress. In May 2019, the Cuban Government announced that it would ration items in short supply such as chicken, cooking oil, eggs, sausage, and soap (de Córdoba, 2019). As the global economy emerged from the downturn induced by COVID-19, higher commodity prices and shipping rates made it more difficult for the Cuban Government to import rationed commodities (Frank, 2021). In February 2023, the Cuban Government confirmed shortages in rations of grains and cooking oil due to "late deliveries" and "import delays" (14ymedio, 2023). In April 2024, however, the Cuban Government announced that it had arranged to obtain supplies of the major rationed products for the months of April and May due in part to a donation from China of 70 metric tons of rice and the anticipated donation of an additional 130 metric tons from China (Sherwood & Acosta, 2024b).

Cuba's Gross Domestic Product (GDP) data are not strictly comparable to those of more market-oriented economies. Historically, the Cuban Government has included "the value of free social services and subsidized consumer goods" in its GDP calculations (Mesa-Lago, 2020). During 2018–22, public health and social assistance's share of Cuba's annual GDP ranged from 15.6 percent to 25.8 percent (ONEI, 2023). As a result, Cuba's official statistics have suggested levels of output and growth higher than the unofficial assessments of researchers and private-sector analysts (Mesa-Lago, 2009; Vidal Alejandro, 2017; Oxford Economics, 2024).

Still, the available macroeconomic data indicate that Cuba's economy has been struggling to achieve rates of growth above 2 percent since 2016, and the country's economic performance had deteriorated following the onset of the COVID-19 pandemic (figure 1). In 2020, Cubans weathered a pandemic-induced 10.9-percent decrease in real GDP, which has been the worst economic downturn in Cuba since the 3 successive years of contraction that followed the Soviet Union's dissolution in 1991. The next 3 years saw modest rates of real GDP growth of 1.3 percent in 2021, 2.1 percent in 2022, and 0.8 percent in 2023 (S&P Global, 2024). Increased trade with

[2] One example of Cuba's export of healthcare services was its participation in Brazil's More Doctors (Mais Médicos) program, in which the Brazilian Government hired foreign healthcare workers to work in remote and poor parts of the country. About 8,300 Cuban healthcare workers hired through the Cuban Government participated in this program during the 2013–18 period. The Cuban Government ended its participation in this program in 2018 in response to additional requirements set by the Brazilian Government, but a new version of the program in which Cuba could potentially participate was launched in 2023 (Brazilian Report Newsroom Staff, 2023).

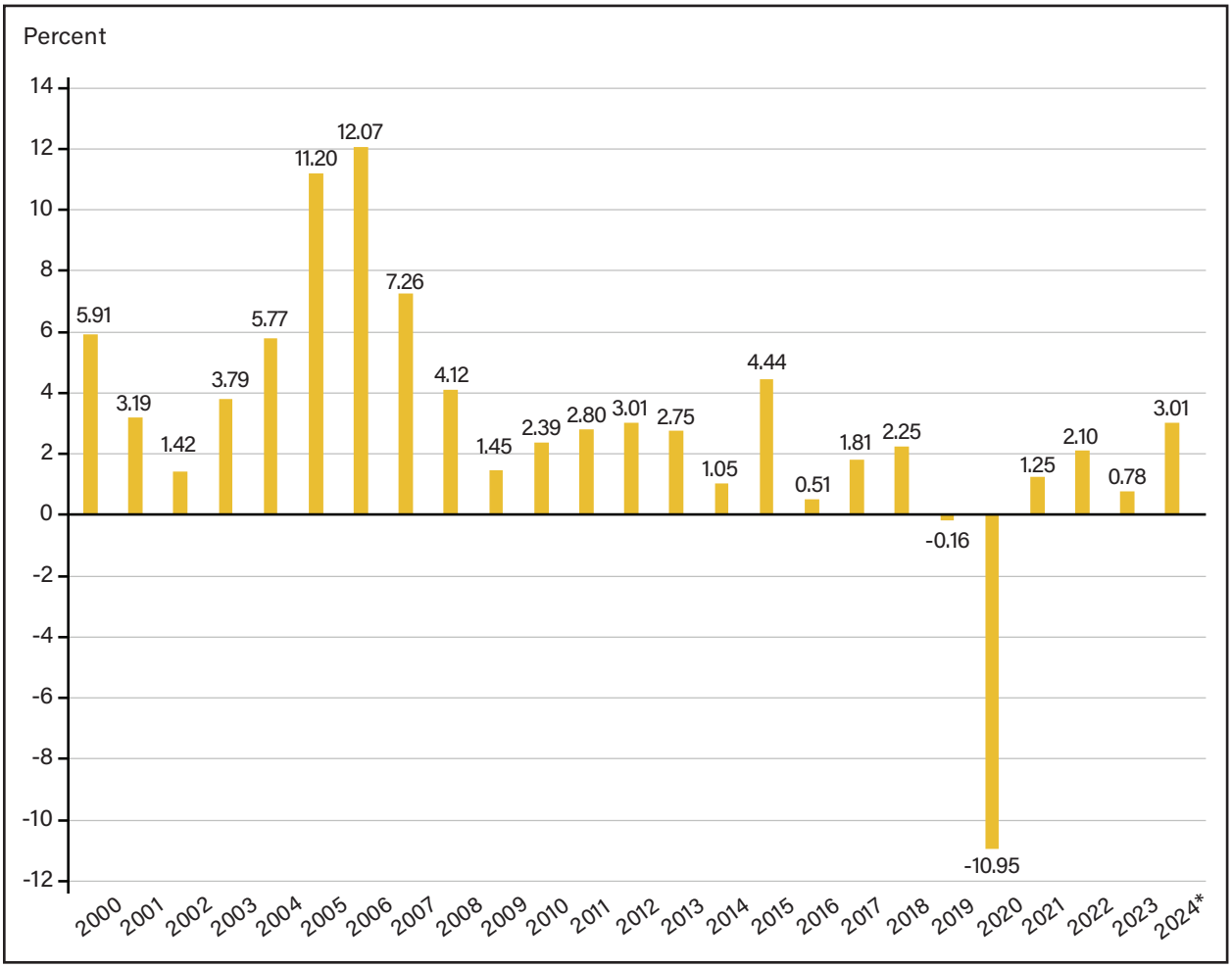
[3] Tafia is a liquor similar to rum and is made from sugarcane juice, refuse sugar, lower grades of molasses, or similar ingredients.

[4] Archuleta (2018) provides a look at Cuba's food ration system circa 2017.

[5] Using the official exchange rate of the Cuban Convertible Peso (CUC) that was in effect in 2020 (24 CUC per U.S. dollar), 8.9 billion pesos corresponded to $370 million.

Russia and exports of services were key factors behind the reactivation of Cuba's economy in 2022 and 2023 (Acosta & Sherwood, 2023; Fuentes & Acosta, 2023; Loeb, 2023).

Figure 1
Annual growth rates of Cuba's real Gross Domestic Product, 2000–24



Asterisk (*) = Projected.

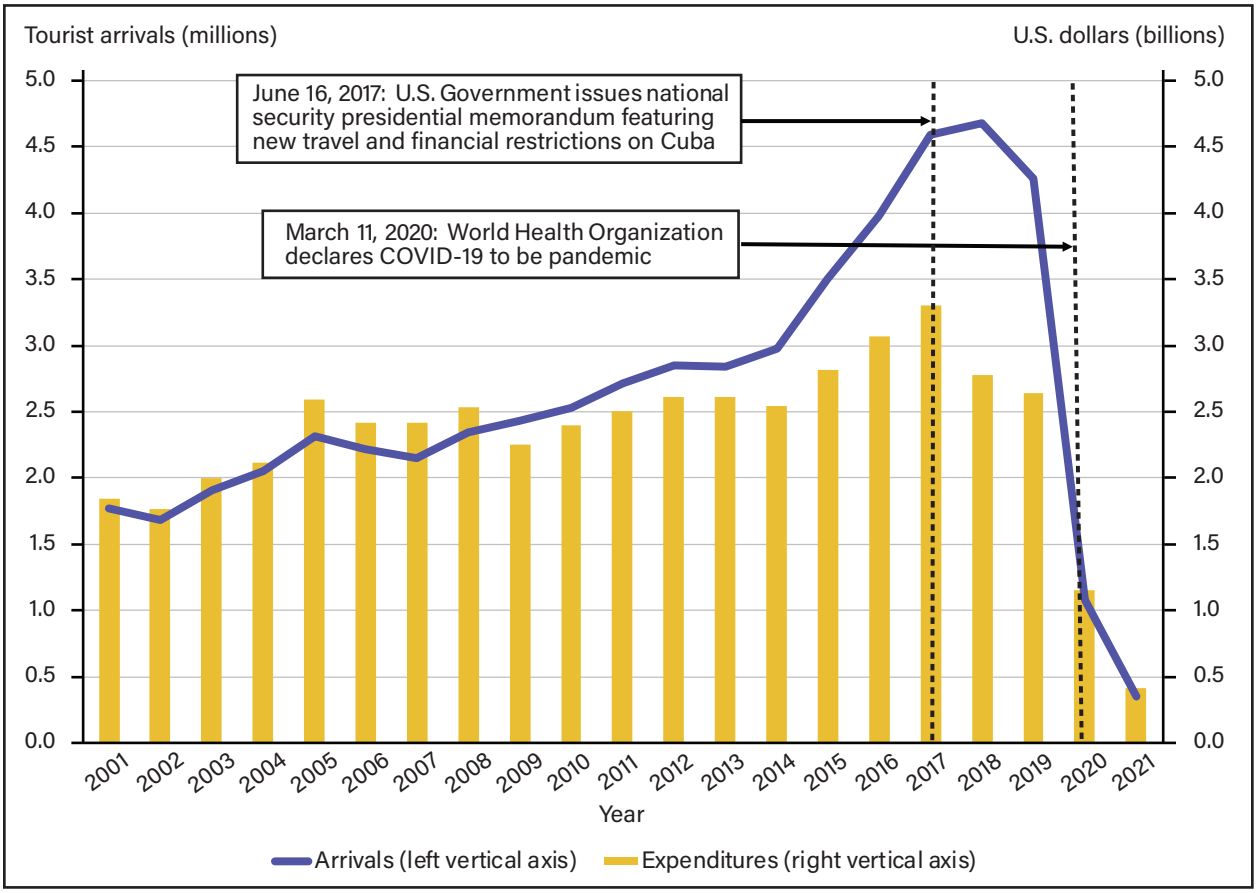
Source: USDA, Economic Research Service using 2000–18 data from USDA, Economic Research Service, *International Macroeconomic Data Set;* and 2019–24 data from S&P Global Market Intelligence database.

The COVID-19 pandemic led to sharp reductions in Cuba's domestic production, tourism revenues, and remittances, which were countered to some extent by the sale of healthcare services abroad (United Nations, Economic Commission on Latin America and the Caribbean, 2021). Tourism in Cuba had already fallen in the 2 years immediately before the pandemic, as the United States imposed new restrictions on traveling to Cuba (figure 2). The United States prohibited individual travel for educational purposes starting in 2017 and group educational travel in 2019.[6] Despite these restrictions, tourism accounted for 10.4 percent of Cuba's GDP in 2019, according to an analysis by the World Travel and Tourism Council (2023). However, with the onset of the pandemic, the number of visitors to Cuba dropped even further, from 4.3 million in 2019 to 1.1 million in 2020 and 356,000 in 2021. Inbound tourism expenditures decreased from $2.6 billion in 2019 to $1.1 billion in 2020 and $400 million in 2021. When the pandemic eased, tourism in Cuba was slow to

[6] The prohibition on group people-to-people educational travel was lifted in June 2022. Sullivan (2022) provided a more complete summary of the evolution of U.S. restrictions on travel to Cuba during 2017–22.

recover, partly because the Cuban Government kept its border mostly closed until November 2021, when most of its population had been vaccinated against COVID-19 (Frank, 2022). In 2023, Cuba was reported to have received 2.4 million tourists, which suggests that the sector had experienced a partial recovery (Acosta, 2024).

Figure 2
Cuba's tourism sector suffered a severe contraction due to the Coronavirus pandemic



Note: Expenditures are measured in nominal (not inflation adjusted) dollars. Number of inbound arrivals equals the sum of the number of overnight visitors (tourists) arriving by air and the number of same-day visitors (excursionists).

Source: USDA, Economic Research Service calculations using United Nations World Tourism Organization arrival data for 2001–2012 and expenditure data for 2001–2016; Oficina Nacional de Estadística e Información (ONEI) arrival data for 2013–21 and expenditure data for 2017–21; Centers for Disease Control and Prevention information on Coronavirus (COVID-19) pandemic; and U.S. Department of State information on national security memorandum.

Remittances[7] to Cuba are challenging to study given the lack of official statistics and the prevalence of hand carried deliveries as a method of transferring cash. The estimates cited by Runde and Higashi (2021) place total remittances to Cuba in 2019 around $1.5 billion to $3.7 billion, which would correspond to 1.5–3.6 percent of Cuba's 2019 GDP.

U.S. remittances to Cuba are subject to various restrictions that the U.S. Government has changed over the years. In 2017, the U.S. Government expanded the set of Cuban officials and Government employees to whom remittances were not permitted. In 2019, several new restrictions were created. A ceiling of $1,000 per

[7] Remittances are transfers of cash or goods sent home by migrants to their families (Rasha, 2005). In this report, the data on remittances only measure cash transfers.

quarter was placed on family remittances to any Cuban national; a ban was created on remittances to the close family members of Cuban Communist Party members or Cuban Government officials to whom remittances were already forbidden; and the category of "donative remittances to Cuban nationals" that allowed remittances to nonfamily members was eliminated, although remittances to support economic activities in the non-State sector were still permitted. In 2020, the U.S. Government added two Cuban financial service companies that had been involved in the processing of remittances to its list of entities affiliated with Cuba's military, intelligence, or security services. This inclusion thereby prohibited U.S. firms from conducting transactions with those two companies (Sullivan, 2022).

This latter change led Western Union, the main company used to transmit remittances electronically to Cuba, to suspend operations there (Sullivan, 2021). Travel disruptions caused by the pandemic limited opportunities for hand deliveries of cash. In this economic and policy context, remittances to Cuba decreased 37 percent in 2020 and 54 percent in 2021, according to estimates by Morales (2022) cited by Mesa-Lago (2023). Following the U.S. Government's elimination of the dollar limits and frequency limits for family remittances to Cuba and the restoration of the category of donative remittances in June 2022, VaCuba, a U.S. company based in Miami, received a license from the U.S. Department of Treasury in November 2022 to work with a civilian Cuban company to send remittances to Cuba (Sullivan, 2022). Western Union also resumed its Cuban operations on a limited basis in January 2023 (Janetsky, 2023).

Future levels of remittances will be shaped by the number of outward migrants from Cuba and the economic and policy circumstances under which such migration occurs. Under the Cuban Adjustment Act of 1966, any Cuban native or citizen who settles in the United States for at least 1 year may apply for lawful permanent residency in the United States. This provision facilitated a large exodus of Cubans in the decades following the Cuban Revolution of 1959. By 2021, nearly 1.3 million Cuban immigrants lived in the United States, according to data from the U.S. Department of Commerce, Bureau of the Census's American Community Survey (Wei & Batalova, 2023). The U.S. Government's approach to Cuba-to-U.S. migration has changed over the years, reflecting efforts to discourage dangerous attempts to leave Cuba and to institute processes for applying to enter the United States.[8] Since 2020, an increase in irregular migration from Cuba to the United States and other countries has occurred due, in part, to the worsening economic situation in Cuba (Augustin & Robles, 2022; Nodarse Venancio & Bare, 2022; Vicent, 2022; Wei & Batalova, 2023). Nodarse Venancio and Bare (2023) estimated that the number of Cubans who came to the United States in fiscal years 2022 and 2023 (about 425,000) plus the number of Cubans who applied for asylum in Mexico from January 2022 to November 2023 (about 36,000) corresponded to approximately 4 percent of Cuba's population.[9]

Healthcare service exports have been another major source of foreign exchange for Cuba, albeit one that has drawn scrutiny due to reports of forced labor (U.S. Department of State, Embassy in Cuba, 2023). These exports are estimated to total approximately $6 billion to $8 billion per year, which would make them Cuba's leading source of foreign exchange (Endresen, 2021; U.S. Department of State, Embassy in Cuba, 2023). The COVID-19 pandemic had a mixed impact on this trade. Although Cuba sent medical brigades to some 40 countries in response to the pandemic (Frank et al., 2020; Endresen, 2021; United Nations, Economic Commission on Latin America and the Caribbean, 2021), the global economic downturn triggered by the pandemic limited the ability of many countries to purchase imports in general. Moreover, in 2018 and 2019,

[8] For details, see Wei and Batalova (2023) and Nodarse Venancio and Oliver (2022).

[9] Recent decisions by Cubans to leave their country are intertwined with economic and political conditions. Amrhein (2024) explored how one Cuban's decision to migrate with her son was made after she refused to take part in her boss's plans to divert goods into the black market from the store where they worked. She was subsequently accused of being a dissident—a factor leading to her departure from Cuba. Pineda (2024) and Agence France-Presse (2024) reported on other cases, including one Cuban resident who cited the worsening challenge of meeting basic needs in the face of repeated blackouts and the rising cost of food. Another person, a playwright, left Cuba for Spain after working multiple jobs to make ends meet and whose play on migration was censored by Cuban authorities.

just before the pandemic, Cuba's healthcare programs in Brazil, Bolivia, Ecuador, and El Salvador were suspended (Brazilian Report, 2023; Frank, 2019; Gámez Torres & Pentón, 2019; 14ymedio, 2019; Faiola & Brown, 2020; Frank et al., 2020; Mesa-Lago, 2023).

Since the Cuban Revolution of 1959, Cuba has relied on preferential economic relationships with foreign allies—particularly the former Soviet Union and, in more recent years, Russia and Venezuela. For much of the 21st century, Venezuela has been Cuba's leading trade partner, serving as a supplier of petroleum and as a buyer of Cuba's medical services. However, recent political and economic instability in Venezuela has led to a reduction in this trade relationship, further reducing Cuba's GDP (Rodriguez & Weissenstein, 2019; Sesin, 2021; Mesa-Lago, 2023). In addition, Russia's invasion of Ukraine resulted in reduced direct Russian support from Russia of Cuba's economy and contributed to higher international staple grain and oil prices in 2022. Due to lower petroleum imports from Venezuela, Cuba turned to Mexico and Russia as alternative suppliers in 2023 (Barrera, 2023; Parraga et al., 2023). However, in September 2023, Venezuela succeeded in increasing its monthly petroleum exports to Cuba (Parraga & Guanipa, 2023).

End of Cuba's Dual Currency System

Following the Soviet Union's dissolution in December 1991 and the accompanying end of Soviet economic subsidies to Cuba, Cuba's economy underwent a structural transformation that expanded the role of tourism, remittances, and other sources of foreign exchange. As part of opening Cuba to foreign tourists and acknowledging the widespread holdings of U.S. dollars and other foreign currencies by Cuba's population, the Cuban Government instituted a dual currency system to regulate, control, and benefit from interactions between the domestic and external economies. Under this system, in effect from 1994 until the end of 2020, one currency, the Cuban convertible peso (peso Cubano convertible (CUC)), was used for international transactions (i.e., tourism and exports or imports by State companies). Another currency, the Cuban peso (peso Cubano (CUP)), was used for domestic transactions. In the latter days of this system, the CUC had an official rate of 24 CUC per U.S. dollar, whereas the CUP was fixed at 1 CUP per U.S. dollar.

This system effectively divided the Cuban economy into two parts, along the same lines of the emerging structural transformation. The more lucrative opportunities were concentrated in the CUC-denominated part of the economy. This motivated some Cuban professionals to leave their occupations "for jobs with access to CUCs that provided them with a higher level of consumption, such as tourism, taxi driving, or joint ventures" (Yaffe, 2021) or to work multiple jobs (Figuerido Reinaldo et al., 2022). In 2011, the Cuban Government announced its intention to eliminate the dual currency system but did not do so until a decade later (United Nations, Economic Commission on Latin America and the Caribbean, 2021).

In January 2021, the Cuban Government ended the dual currency system. The official exchange rate of the CUP was reset to 24 Cuban pesos per U.S. dollar, and the CUC was eliminated. The economic effects of this reform were immediate. Cuba's economy experienced an inflationary shock, and informal trading[10] revealed that the peso at the official exchange rate was greatly overvalued. The inflation rate in Cuba surged to 75.2 percent in 2021, slowed to 63.2 percent in 2022, and was forecast to reach 48.1 percent in 2023 (table 1).[11] In

[10] Informal trading generally refers to "exchanges in which neither records nor statistics are generated; the medium of exchange may be currency or goods and/or services" (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2024). Luis (2023) describes the informal currency market in Cuba as "a decentralized market operating in social media and physically in the island and offshore. Hundreds of transactions take place independently every day. Bid and ask offers are made by participants in the web. It is a retail market largely involving transactions in the hundreds of dollars though it is reported that large transactions take place privately and are not seen in open social media."

[11] Some observers believe that Cuba's inflation rate following the monetary reform was higher than that indicated by the CPI. Vidal and Luis (2024), for instance, offered an analysis based on implicit elasticities in Cuba's national accounts and the pass-through effect through the Phillips curve that the country's inflation rate in 2021 was in the triple digits.

August 2022, Cuba's Government tweaked the new currency system, keeping the official rate of 24 CUP per dollar for the State sector while creating a new rate of 120 CUP per dollar for the rest of the economy (United Nations, Economic Commission for Latin America and the Caribbean, 2022b). The Cuban Government also reopened State-operated exchange houses where foreign currency could be traded at official rates (Rodriguez, 2022). Informal trading of foreign currency has remained prevalent. By March 2024, the CUP was reported to be trading informally at rates around 320 CUP per U.S. dollar (Frank, 2024). Consequently, a class divide has existed between Cubans who have access to foreign currency (via remittances or from transactions denominated in foreign currency) and those who do not have access.

Table 1
Selected economic indicators for Cuba, 2019–23

	2019	2020	2021	2022	2023
Real GDP change (percent change)	-0.2	-10.9	1.3	1.8	1.6
CPI change (percent change)	-1.3	18.5	56.4	40.8	44.0
Current account balance (percent of GDP)	1.4	0.5	0.8	1.8	1.7
Official exchange rate CUP/U.S. dollar	1.0	1.0	24.0	24.0	24.0

CUP = Cuban peso (peso Cubano). GDP = Gross Domestic Product. CPI = Consumer Price Index.

Note: Data for 2023 are forecasts. This table shows the growth rate for 2023 (1.6 percent) reported by S&P Global (2024).

Source: USDA, Economic Research Service using Oficina Nacional de Estadística e Información (ONEI) data, *Trade Data Monitor database*; and S&P Global Market Intelligence database.

Cuban Agriculture

Cuba has struggled to secure sufficient food for its population, either through domestic production or imports, and has experienced a downward trend in food sufficiency. Although some increases in agricultural output have occurred in regions with good water supply, most Cuban farmers have seen few yield increases (ONEI, 2023). A general lack of inputs, including fertilizers, pesticides, and machinery, has hindered agricultural production in Cuba. Since many agricultural inputs must be imported, Cuban agriculture is vulnerable to high international prices for feedstuffs, oil, and fertilizer. Between 2017 and 2021, Cuba's herbicide imports (measured in nominal dollars) dropped by 80 percent, and fungicide and insecticide imports fell by 39 percent (Messina, 2023). Annual fertilizer imports by Cuba (measured in nominal dollars and based on the available statistics of Cuba's trade partners) dropped from $75 million in 2018 to $47 million in 2019 and remained at approximately $43 million–$44 million in 2020, 2021, and 2022 (Trade Data Monitor, 2024)

Cuba is subdivided into 16 provinces (figure 3). The primary agricultural provinces are Granma, Sancti Spiritus, Camagüey, Villa Clara, and Pinar del Rio. In 2022, these provinces, together with the provinces of La Habana, Santiago de Cuba, Holguín, and Matanzas, accounted for 68 percent of Cuba's population (ONEI, 2023b). In 2017, Villa Clara was the largest agricultural producing province, with 10.1 percent of cultivated cropland, followed by Camagüey with 9.7 percent (ONEI, 2023).

Figure 3
Cuba is subdivided into 16 provinces

Source: USDA, Economic Research Service using United Nations, Office for the Coordination of Humanitarian Affairs data.

Agricultural policies are administered through Cuba's Ministry of Agriculture, with its control of Government-owned farms, the Government-directed Basic Units of Agricultural Production (Unidades Básicas de Producción Cooperativa (UBPC)) and the Cooperatives of Agricultural Production (Cooperativas de Producción Agropecuaria (CPA)), which organize small-scale farmers. Complementary to this structure are the nationalized industries, which set production goals and control prices and marketing facilities (ONEI, 2023).

Given its location in the northern Caribbean Sea, Cuba is exposed to hurricanes and other extreme weather. In November 2020, Hurricane Eta resulted in severe damage to crop and livestock production, agricultural infrastructure, and roads. In addition, the hurricane was responsible for the loss of food stocks across several Cuban provinces (Granma, 2020). Hurricane Eta's impact added to an already intense economic crisis brought about by the COVID-19 pandemic and contributed to reduced agricultural output and increased food insecurity. The situation was exacerbated in September 2022 when Hurricane Ian made landfall in western Cuba. The storm damaged the country's power network and affected nearly 9,000 hectares of farmland, with the banana and tobacco crops being the most severely impacted (Prashad & De Los Santos, 2022). Additionally, precipitation levels can range from extreme drought to extreme rainfall. For instance, 94 percent of Cuba's territory was experiencing rainfall deficits at the close of February 2023 (United Nations Development Programme, 2023), while less than 4 months later in June 2023, eastern and central Cuba were struck by heavy rains and damaging floods (Agence France-Presse, 2023).

These natural disasters contributed to a further contraction in Cuba's agricultural output, with the agricultural, livestock, hunting, forestry, and fishing sector seeing successive GDP declines of 22.9 percent in 2020 and 13.2 percent in 2021 (United Nations, Economic Commission on Latin America and the Caribbean, 2023). Production estimates from USDA, Foreign Agricultural Service (FAS) (2024b) and production statistics from ONEI have indicated that for most commodities, Cuba's agricultural sector experienced back-to-back annual output declines in 2020 and 2021 (table 2). Messina (2023) underscored that Cuba's crop production (other than sugarcane) declined by more than 25 percent between 2017 and 2021 and by approximately 50 percent between 2004 and 2021. According to estimates by USDA, FAS (2024b), Cuba's annual corn production dropped from 404,000 metric tons to 250,000 metric tons (38-percent decrease) between marketing years (MYs) 2016/17 and 2023/24, whereas rice production dropped from 335,000 metric tons to 140,000 metric tons (milled basis) (58-percent decrease) over the same timeframe. Sugar exports, once a leading source of foreign exchange for Cuba, fell from 1.1 million metric tons in MY 2016/17 to 110,000 metric tons in 2023/24, a 90-percent decrease.

Table 2

For most commodities, Cuba's agricultural sector saw back-to-back declines in annual output in 2020 and 2021

USDA, FAS, PSD estimates	Marketing year						
Commodity	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
	Metric tons (thousands)						
Coffee, green[1]	150	100	110	90	100	100	100
Corn	404	374	346	276	257	239	167
Meat, chicken	25	24	24	23	11	12	12
Rice, milled	335	263	299	277	174	147	94
Sugar, centrifugal	1,800	1,100	1,300	1,200	850	475	400
Cuba, ONEI statistics	Calendar year						
Commodity	2016	2017	2018	2019	2020	2021	2022
	Metric tons (thousands)						
Cow milk	612.8	536.4	576.9	512.0	455.3	374.2	NA
Cattle slaughter (live weight)	167.6	167.1	178.1	140.3	124.4	163.2	NA
Tubers and roots	1,843	1,829	1,801	1,702	1,269	1,250	NA
Potatoes	96	147	135	131	115	97	NA
Sweet potatoes	594	518	550	476	303	318	NA
Taro	227	174	193	167	102	82	NA
Bananas and plantains	1,016	1,015	961	1,036	860	861	NA
Fruit	298	296	272	284	263	242	NA
Vianda	718	719	689	752	596	619	NA
Vegetables	2,385	2,484	2,454	2,183	1,698	1,713	NA
Tomatoes	481	584	554	403	291	317	NA
Onions	90	111	90	72	58	55	NA
Peppers	71	100	79	75	59	62	NA
Cereals	919	779	807	702	524	465	NA
Paddy rice, wet	514	405	461	426	267	226	NA
Corn	404	374	346	276	257	239	NA
Beans	137	132	162	128	66	58	NA
Tobacco	20	31	30	29	26	22	NA
Citrus fruit	119	99	71	71	43	37	NA
Oranges, sweet	38	31	21	20	10	9	NA
Grapefruit	56	42	24	23	11	7	NA
Lemon	8	10	6	5	4	4	NA
Other fruit	945	926	861	1,094	863	770	NA
Mangos	259	292	238	435	262	247	NA
Guava	161	140	154	143	138	137	NA
Papaya	213	189	177	188	159	82	NA

USDA, FAS, PSD = USDA, Foreign Agricultural Service's *Production, Supply and Distribution* data. ONEI = Oficina Nacional de Estadística e Información. NA = Not available at time of writing.

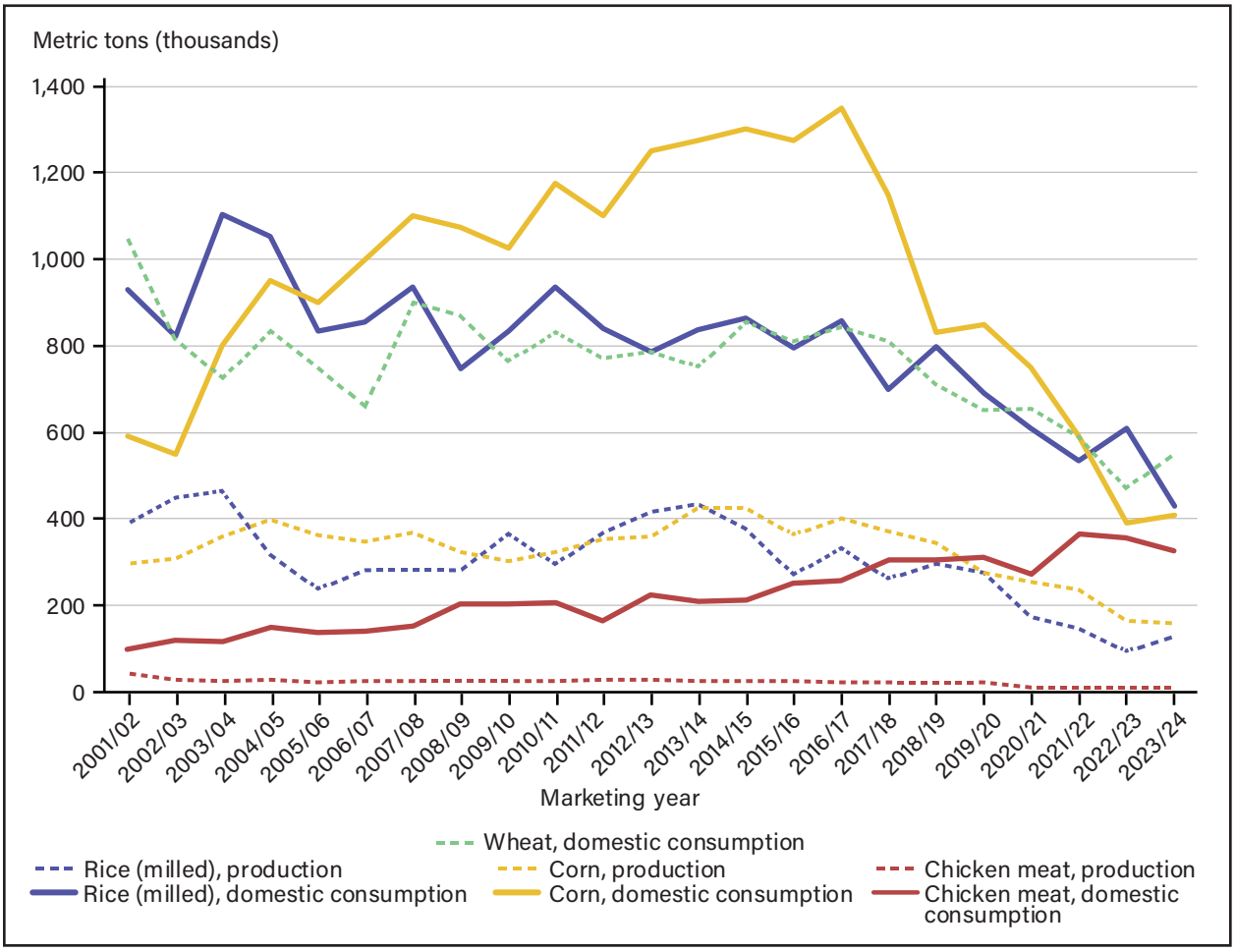
[1] Quantity measured in thousands of 60-kilogram bags.

Note: Marketing years are October 1–September 30 for corn and sugar, July 1–June 30 for coffee and rice, and January 1–December 31 for chicken meat (with the first year listed identifying the relevant calendar year). In the context of bananas and plantains in the Caribbean, the term "vianda" can refer to either plantains, green plantains, or green bananas (Ortíz Cuadra, 2014).

Source: USDA, Economic Research Service using USDA, Foreign Agricultural Service, *Production, Supply and Distribution* database; and Oficina Nacional de Estadística e Información (ONEI) data.

Cuba's main agricultural imports include chicken meat as a source of animal protein, wheat for bread baking, and rice as a source of carbohydrates. Other imported commodities such as soybean oil and corn are used to make other agricultural and food products. This composition of imports reflects the Cuban Government's efforts to fulfill the main dietary needs of Cuba's population that cannot be satisfied by domestic production and to smooth variations in consumption across time through the periodic accumulation and depletion of stocks. For both rice and corn, domestic consumption and production have trended downward since 2016/17, according to estimates by USDA, FAS, illustrating the challenges facing Cuba to expand agricultural production and afford agricultural imports (figure 4). In contrast, domestic consumption of chicken meat trended upward through successive increases in imports rather than an increase in domestic production, as the country lacked the feed needed to boost poultry production. Cuba's production of soybeans and wheat is negligible.[12]

Figure 4
Cuba's production and domestic consumption of several agricultural commodities are on downward trends



Note: Marketing years are October 1–September 31 for corn, July 1–June 30 for coffee and rice, and January 1–December 31 for chicken meat (with the first year listed identifying the relevant calendar year).

Source: USDA, Economic Research Service using USDA, Foreign Agricultural Service, *Production, Supply and Distribution* data.

[12] The Cuban News Agency (2024) reported that increasing domestic soybean production is part of the country's food sovereignty strategy and describes the efforts of one soybean farmer to build an oil extraction facility.

Food Security Estimates

International Food Security Assessment Model

USDA, Economic Research Service's (ERS) International Food Security Assessment (IFSA) model was used to estimate Cuba's food security status in 2023 (Zereyesus et al., 2023).[13] Food security at a country level is evaluated by estimating the share of the population across income deciles that is unable to reach a caloric threshold of 2,100 kilocalories (kcal) per person per day.[14] The intensity of food insecurity for those falling below the minimum caloric target is measured by the gap between projected food demand and the caloric threshold. Food demand is expressed in grain equivalents, based on caloric content, to allow for aggregation across four separate food groups: the primary grain consumed in the country (rice in Cuba), other grains, roots and tubers, and all other food.[15]

The data for the assessment of Cuba's food security status were drawn from various sources. Average per capita food consumption data came from the Food and Agriculture Organization (FAO) of the United Nations Food Balance Sheets, which contains data for Cuba through 2020,[16] and from the FAO's Country Cereal Balance Sheet, which was current through 2023. Tariff data were collected from the World Bank's *World Integrated Trade Solution* (WITS) online database (World Bank, 2023), where data for Cuba have been reported through 2021. Incomes, exchange rates, and consumer price indices were obtained from several sources, including USDA, ERS' *International Macroeconomic Dataset* (2023), S&P Global Market Intelligence, and the United Nations' Economic Commission for Latin America and the Caribbean's (ECLAC) *Statistical Yearbook for Latin America and the Caribbean 2021*. This assessment of Cuba's food security also relied on world price assumptions used in the *USDA Agricultural Projections to 2032* (USDA, Office of the Chief Economist, World Agricultural Outlook Board, 2023). Income and price elasticities were not available for Cuba, so the authors used a subregional average for the Caribbean for these parameters. The IFSA model has relied on income distribution data from the World Bank, but these data were not available for Cuba. Thus, the Caribbean subregional average was used as a substitute. The projections from the IFSA model do not consider possible impacts of future events, such as climate change, unusual weather conditions, technological improvements, and policy changes.

The model was calibrated for each of the four food groups (i.e., rice, other grains, roots and tubers, and other foods) based on average prices and income from 2020–22. Prices were expressed in real local currency units. Quantities were expressed in grain-equivalent units. Domestic prices were calculated based on a price transmission equation and data from the FAO, Global Information and Early Warning System on Food and Agriculture's (FAO-GIEWS) Food Price Monitoring and Analysis Tool. For food prices not observed in the calibration stage (i.e., data not available, such as for Cuba), a synthetic domestic price, p_i^{ds}, that was linked to the world price, p_i^w was created and expressed in local currency (appendix A). This linkage is intended to capture the effect of world markets on unobserved local market prices. However, it does not incorporate the effect of government policies in Cuba, such as food subsidies, which may affect local prices.

[13] The IFSA model was developed to estimate food demand and food availability in low-income and lower middle-income countries. However, due to data limitations, not all countries were included in the annual IFSA report.

[14] The 2,100-kilocalorie per capita per day threshold is an internationally agreed upon level set by the United Nations' FAO as the recommended level of dietary energy intake for a healthy, well-nourished individual. This level is an average across sex, age, region, and activity level (United Nations, Food and Agriculture Organization (FAO), 2004).

[15] More information on the IFSA model can be found in appendix A of Zereyesus et al. (2023).

[16] A significant portion of the FAO Food Balance Sheet data for Cuba was imputed or estimated.

Cuba's GDP data have not been strictly comparable with those of more market-oriented economies. Furthermore, the incomes and purchasing power of Cuba's population have been highly correlated with access to foreign exchange. Remittances from abroad provide many Cubans with additional income to supplement their wages, salaries, or pensions. These remittances are usually in the form of U.S. currency, which has provided a better store of wealth than the inflation-battered Cuban peso (CUP). Similarly, Cubans who have worked in the tourism sector or in related sectors, such as the taxi industry, may have received tips and other payments in U.S. dollars or other foreign currencies. In some instances, workers in these sectors have supplemented their wages and income from other jobs. In contrast, Cuban Government workers typically received low salaries that were not frequently adjusted for inflation. Many members of this group, including teachers, doctors, and nurses, were reported to be leaving Cuba, with some emigrating to the United States (Augustin, 2023).

Although small private sector grocery stores have emerged in Cuba following the Government's efforts in 2021 to foster the development of small and medium enterprises, many Cubans cannot afford the products in these stores.[17] As a result, these stores have a narrow clientele that includes "Cuban families who receive remittances from abroad, tourism workers, diplomats, employees of other small- and medium-sized businesses, artists and high-performance athletes" (Rodriguez, 2023b). In July 2024, the Cuban Government instituted price ceilings on a number of products sold by private businesses, including chicken, cooking oil, pasta, powdered milk, and sausages (Gámez Torres, 2024).

Because of these features of the Cuban economy, the authors calculated an income proxy using GDP growth rates reported by the United Nations' Economic Commission on Latin America and the Caribbean (ECLAC).[18] One limitation of GDP per capita has been that it has overestimated purchasing power, especially for lower income groups, as it represents a national average. Using ECLAC growth rates, the authors estimated Cuba's GDP per capita in 2023 at 6,780 U.S. dollars (USD). To consider the possibility that average income might be lower than reported and account for the potentially lower purchasing power of Cuban households, the authors considered a scenario that reduced the average GDP per capita to 5,015 USD. This represents a 26.0-percent reduction from the estimate using ECLAC growth rates and aligns with the average GDP per capita for the Caribbean subregion. This scenario considered the impact of reduced purchasing power by Cuban households due to both lower GDP and higher inflation than reported. The authors then calculated an income distribution based on the average per capita GDP and a measure of income inequality using the IFSA model. This calculation process allowed food insecurity to be assessed across all income strata, as average income may have overstated the purchasing power of the low-income population (appendix table A.2).

The most recent data on Cuba's food consumption were from FAO, estimated as of 2020 (table 3). FAO provided data on country-level cereal balances through 2023. Cuba has relied on imports of rice, wheat, corn, and vegetable oils for domestic consumption. According to FAO, between 2016 and 2020, Cuba's estimated food supply of grains, roots, and vegetable oils dropped from 3,426 to 3,339 kilocalories per capita per day, a decline of 2.5 percent (figure 5). This figure is a national average that does not capture the consumption variation across income deciles.

[17] For more information about the Cuban reform on small and medium enterprises, see Rodriguez (2021a), Gutierrez (2023), and U.S. Congress, House, Committee on Foreign Affairs, Subcommittee on Western Hemisphere (2024).

[18] Cuba's GDP was calculated using United Nations' Economic Commission on Latin America and the Caribbean (ECLAC) GDP growth rates for the periods 1982–1988 and 2012–2015 and Oficina Nacional de Estadística y Información (ONEI) GDP growth rates for 2016–2020.

Table 3

Food and Agriculture Organization of the United Nations' food balance sheet for Cuba's consumption of grains, roots, and vegetable oils, 2020

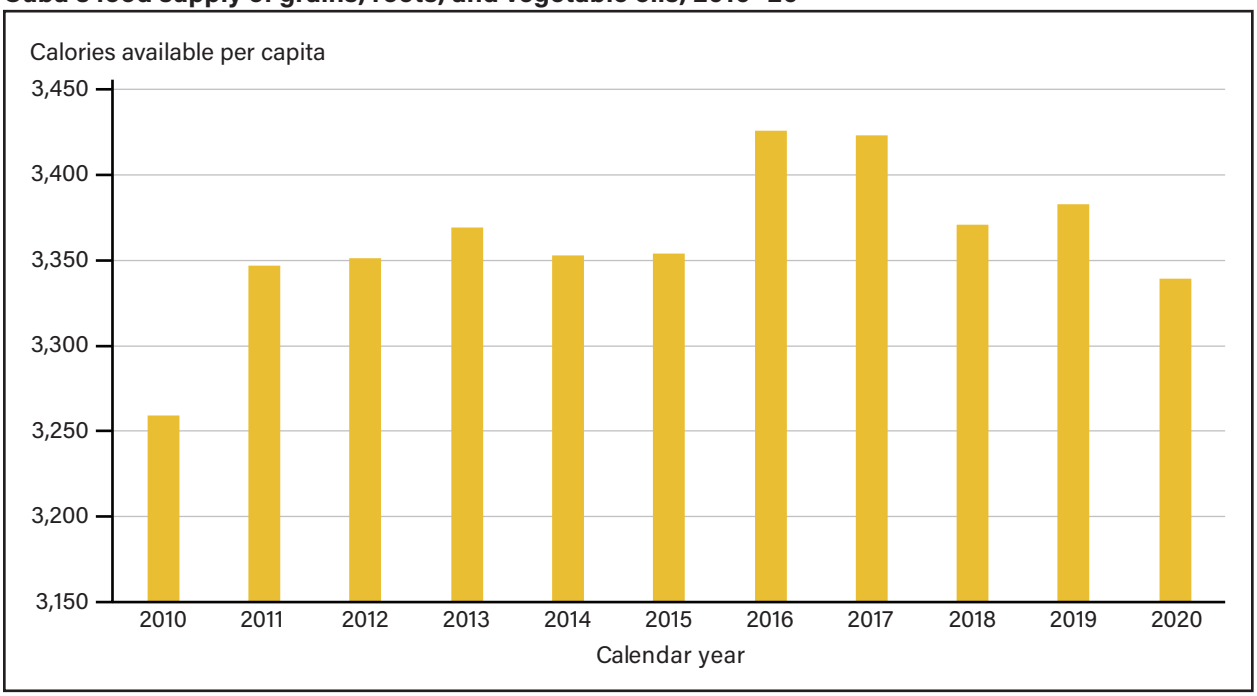
Item	Production	Imports	Stock variation	Domestic supply	Exports	Nondomestic food consumption	Food supply
	Thousand metric tons						
Starchy roots	1,268	12	-125	1,405	0	406	998
Rice	267	710	-63	1,040	0	173	867
Wheat	0	739	0	739	1	109	630
Corn	257	780	-3	1,040	0	732	309
Vegetable oils	32	111	-4	146	0	13	133

Note: Nondomestic food consumption included feed, seed, residuals, consumption by tourists, losses, processing, and other nonfood uses. Millet, barley, sorghum, rye, oats, and other cereals were omitted due to zero net food supply. Domestic supply was calculated as production plus imports minus stock variation. Food supply was calculated as domestic supply minus exports and nondomestic food consumption.

Source: USDA, Economic Research Service calculations using United Nations Food and Agriculture Organization data.

Figure 5

Cuba's food supply of grains, roots, and vegetable oils, 2010–20



Source: USDA, Economic Research Service calculations using United Nations, Food and Agriculture Organization data.

Results

The food security estimation results are reported for both the estimates of GDP per capita using ECLAC growth rate data and the reduced GDP scenario based on the average for the Caribbean subregion. Using the unadjusted estimates, in 2023, 12.8 percent of the Cuban population may not have been able to consume an average of 2,100 calories per capita per day, which is equivalent to 1.4 million food insecure people (table 4). The average food gap was 225 calories per capita per day, which is equivalent to an overall food gap of 41,000 metric tons per year for the entire food insecure population. Using the reduced GDP scenario (equivalent to

the subregional average GDP per capita), the prevalence of food insecurity was estimated to be 37.8 percent, equivalent to 4.2 million people. The average food gap was estimated to be 306 calories per capita per day, which implies an overall food gap of 164,000 metric tons per year for Cuba's entire food insecure population.

Table 4
Estimated 2023 food insecurity in Cuba under the two scenarios

Scenario	Population	GDP per capita	GDP	Share of population food insecure	Population food insecure	Food gap (per capita)	Food gap (total)
	Million	2015 USD	Million, 2015 USD	Percent	Million	Calories per capita per day	1,000 metric tons
Unadjusted GDP using ECLAC growth rate data	11.2	6,780	75.9	12.8	1.4	225	41
Subregional average GDP	11.2	5,015	56.1	37.8	4.2	306	164

GDP = Gross Domestic Product. USD = U.S. dollars. ECLAC = United Nations, Economic Commission for Latin America and the Caribbean.

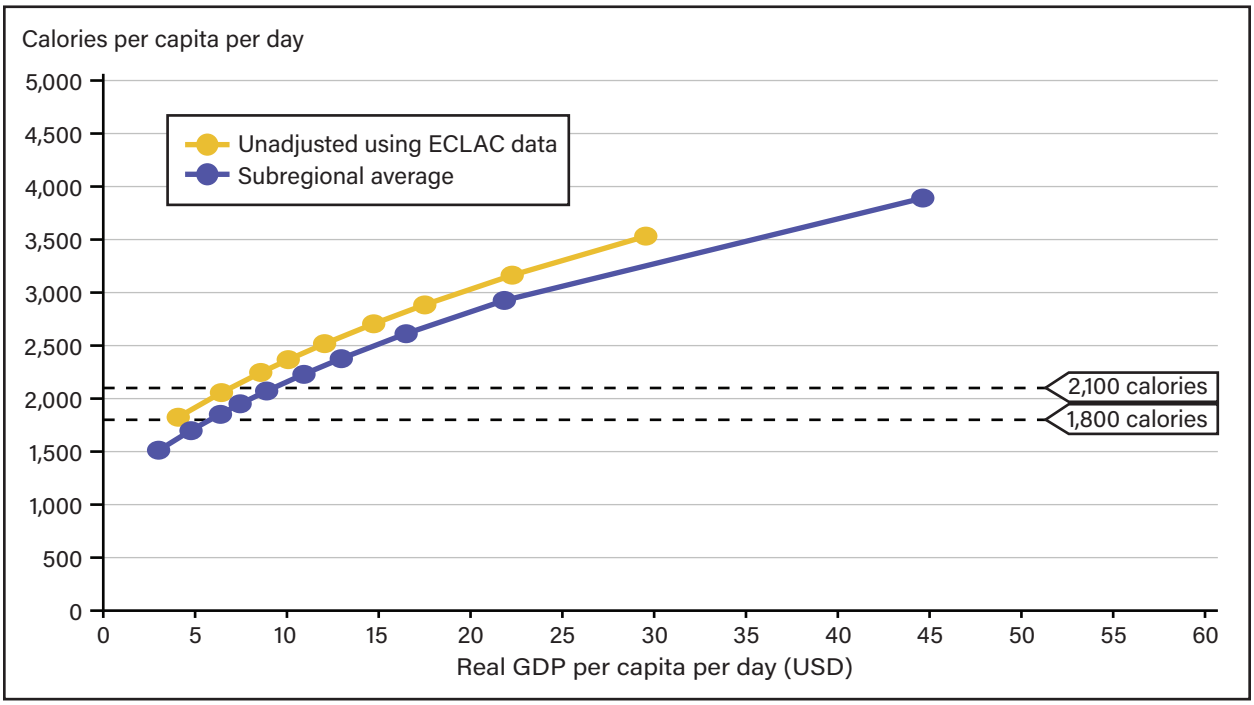
Note: GDP and GDP per capita are real 2015 U.S. dollars. The food gap is the difference between the caloric threshold of 2,100 kcal and the average calorie availability for food insecure people.

Source: USDA, Economic Research Service estimates using International Food Security Assessment model.

In the adjusted GDP scenario, the two poorest income deciles consumed less than 1,800 calories per day, a level of consumption that can lead to significant malnutrition (figure 6). It is worth noting that the lower income groups spend a higher proportion of their incomes on food. Thus, any significant increase in price and/or reduction in disposable income disproportionately affects these groups. There are no similar measures of food insecurity for Cuba from other sources. FAO does not measure experiential food insecurity (FIES), and in FAO's *State of Food Security and Nutrition in the World* (SOFI) report (United Nations, Food and Agriculture Organization et al., 2023), the organization has consistently reported that the prevalence of undernourishment in Cuba is less than 2.5 percent.[19]

[19] Ministerio de Salud Pública, Dirección de Registros Médicos y Estadísticas de Salud, and UNICEF Cuba (2020) offers measures of nutritional security for vulnerable subgroups in Cuba.

Figure 6
For many people in Cuba, fewer than 2,100 calories per capita per day are available



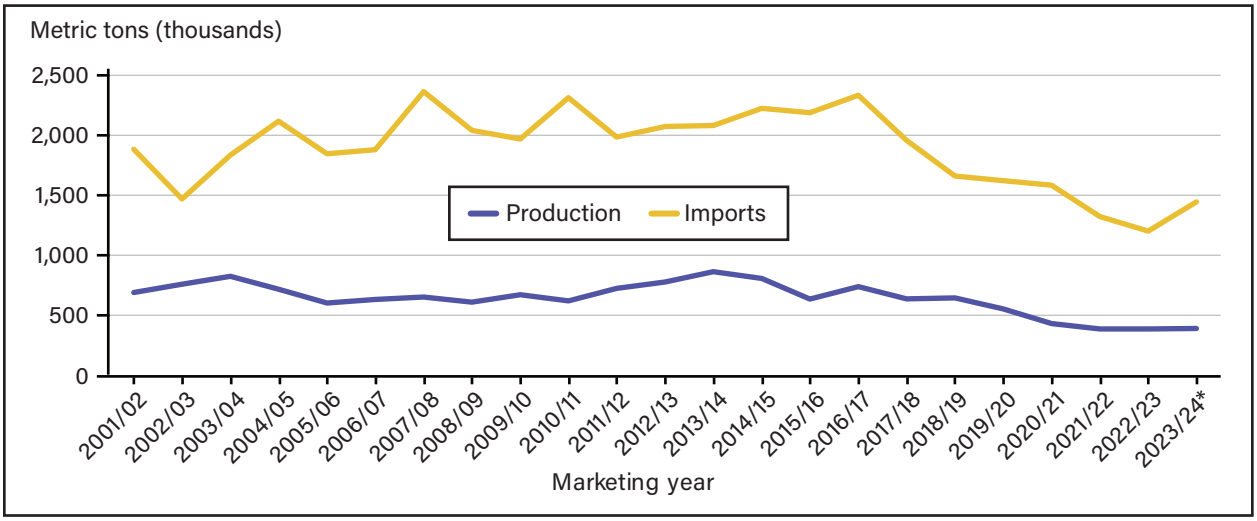
ECLAC = United Nations, Economic Commission for Latin America and the Caribbean. USD = U.S. dollars.

Note: Gross domestic product (GDP) per capita is reported in 2015 U.S. dollars.

Source: USDA, Economic Research Service estimates using the International Food Security Assessment model.

Based on estimates from USDA, FAS's *Production, Supply and Distribution* (*PSD*) database (USDA, FAS, 2024b), grain production (rice, wheat, and corn) in Cuba has been declining since 2016, with less than 400,000 metric tons produced in 2022 (figure 7). Cuba's grain sector has only seen short periods of sustained output growth during the 21st century, with periods lasting no more than 3 years with no signs of a long-term upward trend. To fill the gap between domestic production and consumption, Cuba has relied on agricultural imports, but such imports have also been declining since 2016, which totaled approximately 1.2 million metric tons in 2022.

Figure 7
Cuba's domestic grain production and grain imports, marketing years 2001/02–2023/24



Asterisk (*) = Projected. All other values are estimates.

Note: Total grains are an aggregate of wheat, corn, and milled rice. Marketing years run from October 1 to September 31 for corn; from January 1 to December 31 for milled rice during marketing years 2001/02–2004/05; from April 1 to March 31 for milled rice during marketing years 2005/06 and 2006/07; from July 1 to June 30 for milled rice during marketing years 2007/08 to 2023/23; and from July 1 to June 30 for wheat.

Source: USDA, Economic Research Service calculations using USDA, Foreign Agricultural Service, *Production, Supply and Distribution* data.

Cuba's Agricultural Trade

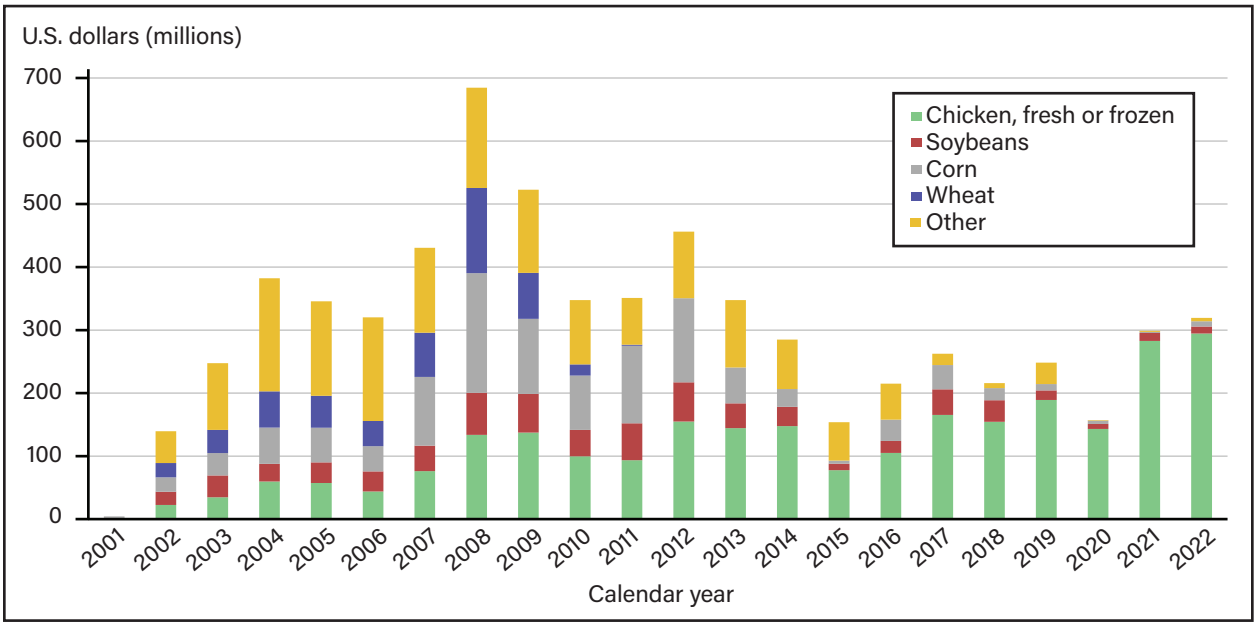
Given the geographic proximity of Cuba and the United States, Cuba would seem like a logical market for a broad array of U.S. agricultural products. This assumption could especially be applied to grains and feeds, oilseeds and oilseed products, and animal products, product categories where the United States has been a leading global exporter. However, the long-standing U.S. economic embargo on Cuba has greatly limited trade and investment opportunities between the two countries. Although the United States loosened the embargo in 2000 to allow for the export of agricultural products and medicines, Cuba must either pay for these products from the United States in cash or rely on third-country financing.[20] Previous research concluded that these payment requirements and financial restrictions have inhibited U.S. agricultural exports to Cuba (U.S. International Trade Commission, 2007; Messina, 2015; Zahniser et al., 2016). Partly because of these restrictions, Cuba has continued to obtain many of its agricultural imports from suppliers that are further than the United States, including countries that have allowed their exporters to extend credit to Cuban buyers. Moreover, the decline in Cuba's economy has made it challenging for the country to afford agricultural products from any supplier.

Changes in Cuba's agricultural trade since the normalization of U.S.-Cuba relations in 2016 have reflected the new restrictions on travel and remittances to Cuba and the accompanying deterioration of Cuba's

[20] As required by the Trade Sanctions Reform and Export Enhancement Act of 2000, only two payment or financing methods may be used for authorized exports or reexports of agricultural commodities or products to Cuba: "payment of cash in advance or financing by a banking institution located in a third country" (i.e., a country other than the United States and Cuba) (U.S. Department of Treasury, Office of Foreign Assets Control, 2022). In 2016, the U.S. Government changed its definition of "cash in advance" with respect to U.S. exports to Cuba to mean "cash before transfer of title." This modification allows Cuban payments for U.S. agricultural products to be made just prior to the product's offloading in Cuba as opposed to prior to the product's departure from the U.S. port (Sullivan, 2022; Regmi, 2021).

economy. U.S. agricultural exports to Cuba totaled $299 million in 2021, $319 million in 2022, and $337 million in 2023, export totals similar to those of 2013 and 2014 and higher than those during the 2017–20 period (figure 8). In 2016, the year relations were normalized, U.S. agricultural exports to Cuba were concentrated in three commodities: chicken meat, soybeans, and corn. However, over the past 4 years (2020–23), chicken meat has accounted for 89.5 percent of U.S. agricultural exports to Cuba (calculated using nominal values, i.e., not adjusted for inflation). Almost all the chicken meat exports were in the category of cuts and offal, frozen (Harmonized System (HS) 6-digit code 020714). This category includes chicken leg quarters (USDA, FAS, 2024a), a cut that features the thigh, drumstick, and part of the backbone. This pattern of relatively low exports concentrated in a single commodity contrasted with the pattern of trade seen in the aftermath of Hurricane Michelle in November 2001 and Hurricane Ike in November 2008, when Cuba imported larger volumes of a more diverse set of agricultural products from the United States (Messina, 2015). Cuba now relies on Brazil instead of the United States for corn imports, and Cuba has largely stopped importing soybeans in favor of soybean oil from Brazil. However, in 2023, the product composition of U.S. agricultural exports to Cuba broadened slightly to include larger amounts of pork, coffee, and fruit juice, among other items.

Figure 8
U.S. agricultural exports to Cuba by product, 2021–23



Other = All other agricultural products.

Note: Trade values are measured in nominal (not inflation adjusted) dollars. Product categories correspond to Foreign Agricultural Trade of the United States (FATUS) product classifications used in USDA, Foreign Agricultural Service (2024a).

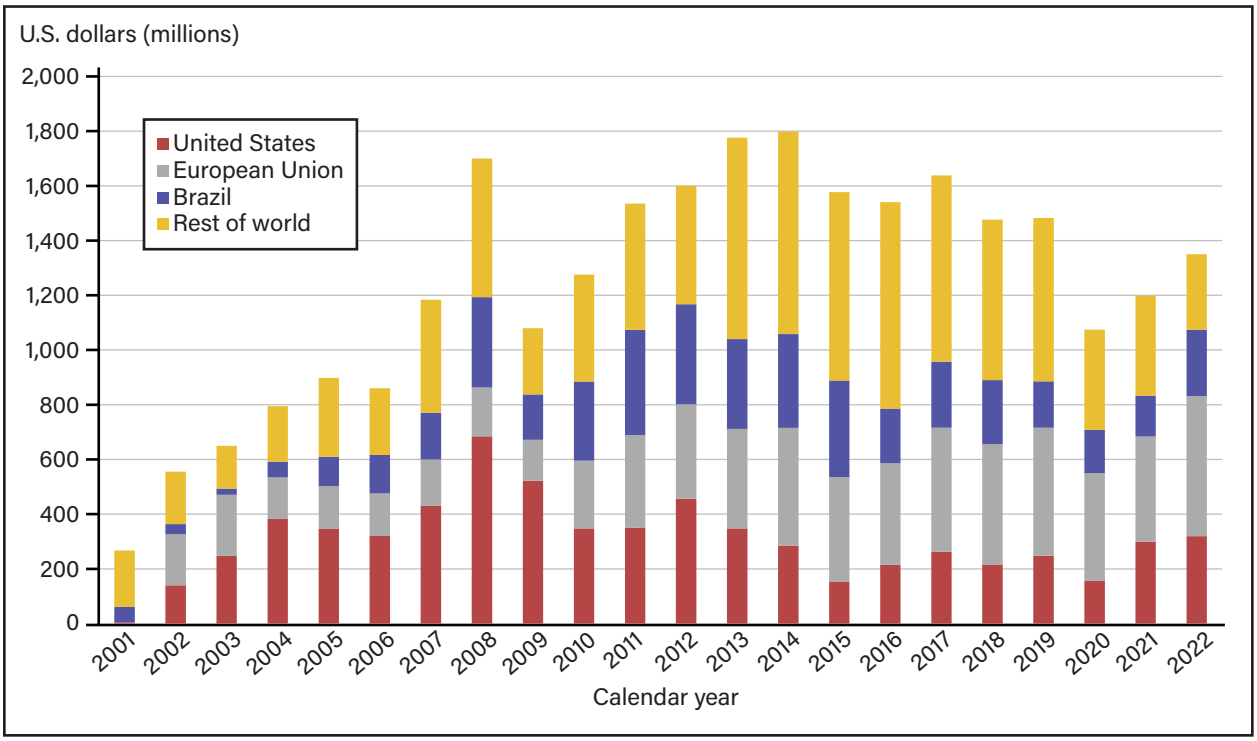
Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census data, as compiled by USDA, Foreign Agricultural Service, *Global Agricultural Trade System database*.

Why did U.S. agricultural exports to Cuba not increase and product composition not become more diversified following the normalization of relations in 2016? There are several possible explanations, three of which are discussed here. First, as was mentioned above, the U.S. Government's requirement that Cuba pay for agricultural imports in cash may have led Cuba to import less from the United States and more from countries that allowed credit to be extended (U.S. International Trade Commission, 2007; Messina, 2015; Zahniser et al., 2016). Second, the Cuban Government's longstanding practice (discussed below) has been to rely on a diverse set of suppliers for agricultural imports, including from countries with close economic relationships

with Cuba, such as China, Venezuela, and Vietnam. Third, the application of more restrictive U.S. sanctions on trade and travel with Cuba in 2017, 2018, and 2019 may have had a dampening effect on U.S. agricultural exports to Cuba. Such sanctions discouraged some prospective U.S. tourists from visiting Cuba, thereby decreasing the aggregate quantity of food needed for tourists and the income generated by tourism, some of which could have been used to purchase agricultural imports for Cuba's population. As the new restrictions were being announced, the National Farmers Union (2017) issued a statement that the policy change would put U.S. family farmers on "a backward trajectory" in the Cuban market, and the American Farm Bureau Federation (2018) expressed the view that "trade restrictions need to be removed for Cuba to be improved as a market for farmers and ranchers."

Cuba has continued relying on countries other than the United States, mainly the member states of the European Union (EU) and Brazil, for much of the country's agricultural imports (figure 9). During 2017–22, the EU was Cuba's leading supplier of agricultural imports, with an average annual share of 33 percent, while the United States and Brazil followed with average shares of 18 percent and 15 percent, respectively.

Figure 9
Agricultural exports to Cuba by the European Union, Brazil, the United States, and the rest of the world, 2001–22



Rest of world = The 62 other countries reported by Trade Data Monitor (2024) as exporters of agricultural products to Cuba between 2001 and 2022, including Uruguay, Canada, New Zealand, Turkey, and Mexico.

Note: Values are measured in nominal (not inflation adjusted) dollars. The export statistics for the European Union (EU) are for the 27 current member states and do not include exports by the United Kingdom, which left the EU on January 31, 2020.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census data, as compiled by USDA, Foreign Agricultural Service, *Global Agricultural Trade System* database; and other national government data as compiled by *Trade Data Monitor* database.

The sluggish performance of the Cuban economy in recent years has also reduced Cuba's ability to purchase agricultural imports and has been associated with declining food security. World agricultural exports (from all countries) to Cuba did not grow in 2018 and 2019 and then experienced a year-to-year decline of 28

percent in 2020 (figure 5). However, the export data in figure 5 and table 5 do not include all of Cuba's trading partners. Venezuela, Vietnam, and Russia are important omissions that could affect the overall totals and shares in significant ways.[21] For example, in 2022, Vietnam exported about 244,000 metric tons of rice to Cuba (Vietnam Customs, as cited by USDA, Foreign Agricultural Service, 2023b).[22] Also, Russia was reported to have made an emergency donation to Cuba of 25,000 metric tons of wheat in 2023 (Fuentes & Acosta, 2023).

Trade statistics at the product level revealed that Cuba imported various agricultural products during 2017–22 from its trade partners as a group but just one main agricultural product from the United States (table 5). Wheat, beer, chicken meat, and pork were the EU's leading agricultural exports to Cuba, whereas soybean oil, chicken meat, rice, and corn were Brazil's leading agricultural exports to Cuba (table 5). Although Cuba obtained most of its chicken meat imports during this period from the United States, it also imported sizable quantities from the EU and Brazil. From countries other than the United States, Cuba imported various agricultural products other than chicken meat. From Uruguay and the EU, Cuba imported nonfat dry milk, a versatile product that does not require refrigeration and can be used to manufacture infant formula. Cuba imported soybean oil from Brazil during this period, but it did not import from any country sizable quantities of soybeans, another commodity that Cuba once imported from the United States. From Canada, Cuba imported dried peas, a commodity that can be used in feed rations.

Table 5
Agricultural exports to Cuba by the United States, European Union, Brazil, Canada, and Uruguay, and the rest of the world, with detail for selected products, 2017–22

Supplying country/product	2017	2018	2019	2020	2021	2022	Annual average, 2017–22
	U.S. dollars (millions)						
All countries							
Total, agricultural products	1,638	1,477	1,483	1,075	1,198	1,350	1,370
United States							
Total, agricultural products	262	216	248	157	299	319	250
Chicken meat	165	155	189	143	283	295	205
Corn	38	19	10	5	2	8	14
Soybean oil	0	6	0	0	0	0	1
Beer	0	0	0	0	0	0	0
Rice	0	0	0	0	0	0	0
Dried peas	0	0	0	0	0	0	0
Nonfat dry milk	0	0	0	0	0	0	0
Wheat and meslin	0	0	0	0	0	0	0
All other agricultural products, not listed above	58	35	49	9	14	16	30
European Union							
Total, agricultural products	453	440	468	392	385	512	442
Wheat and meslin	131	105	146	116	124	102	121
Beer	23	29	36	28	26	108	42
Nonfat dry milk	29	19	18	26	15	22	22
Chicken meat	1	4	26	49	6	36	21

Table continues on next page >

[21] At the time of writing, the most recent bilateral trade statistics reported by Cuba and Venezuela in the *UN Comtrade* database (United Nations, 2024) were for the years 2018 and 2013, respectively, and Russia and Vietnam most recently reported bilateral trade statistics for Cuba in that database for the years 2021 and 2013, respectively.

[22] Vietnam News Agency (2023) offers an overview of Cuba-Vietnam relations.

Continued from previous page

All other agricultural products, not listed above	268	283	240	173	214	244	237
Brazil							
Total, agricultural products	241	234	170	158	149	242	199
Soybean oil	91	56	46	29	43	95	60
Chicken meat	66	85	51	59	38	37	56
Rice	16	27	12	28	30	50	27
Corn	18	21	29	24	15	17	21
All other agricultural products, not listed above	50	45	31	18	24	43	35
Canada							
Total, agricultural products	109	100	98	57	70	52	81
Dried peas	22	16	21	18	22	38	23
All other agricultural products, not listed above	87	84	77	39	48	14	58
Uruguay							
Total, agricultural products	57	49	64	63	28	56	53
Nonfat dry milk	30	35	35	19	26	28	29
Rice	25	7	23	37	0	27	20
All other agricultural products, not listed above	2	6	6	7	2	1	4
Rest of world							
Total, agricultural products	515	438	435	246	267	168	345

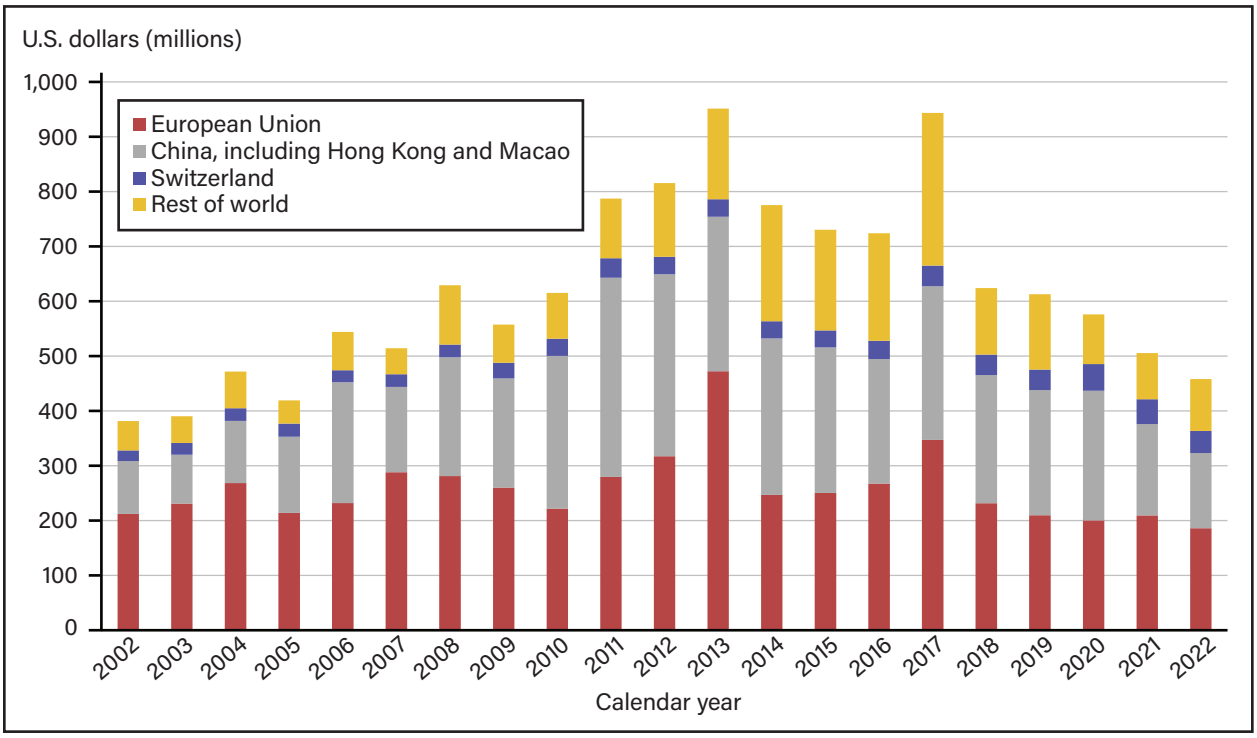
Rest of world = The 62 other countries reported by Trade Data Monitor (2024) as having exported agricultural products to Cuba between 2001 and 2022, including Uruguay, Canada, New Zealand, Turkey, and Mexico.

Note: Values are measured in nominal (not inflation adjusted) dollars. The export statistics for the European Union (EU) are for the 27 current member states and do not include exports by the United Kingdom, which left the EU on January 31, 2020.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census data, as compiled by USDA, Foreign Agricultural Service, *Global Agricultural Trade System* database; and other national government data, as compiled by *Trade Data Monitor* database.

One aspect of Cuba's sluggish economy has been its difficulty to export goods and services, including agricultural products. Based on the available trade statistics, Cuba's agricultural exports dropped from $944 million in 2017 to $458 million in 2022, a 51.5-percent decline (figure 10). Considering that exports were high in 2017 due to increased cane sugar sales to the EU and China, Cuba's agricultural exports have been on a clear downward trend over the past decade (2013–22). However, the import data in figure 10 (and in table 5) did not include all of Cuba's trade partners, as Venezuela, Vietnam, and Russia were notable absences. As a result, the available trade data undercount Cuba's agricultural exports by an unknown amount.

Figure 10
Agricultural imports from Cuba by the European Union, China, Switzerland, and the rest of the world, 2002–2022



Rest of world = The 86 other countries reported by Trade Data Monitor (2024) as having imported agricultural products from Cuba between 2001 and 2022, including United Kingdom, Australia, Canada, and Turkey.

Note: Trade values are measured in nominal (not inflation adjusted) dollars. Import statistics were not available for all of Cuba's trade partners. The import statistics for the European Union (EU) are for the 27 current member states and do not include the United Kingdom, which left the EU on January 31, 2020.

Source: USDA, Economic Research Service calculations using national government data as compiled by *Trade Data Monitor* database.

Among the countries for which import data were available, the EU, China, and Switzerland were the leading destinations for Cuban agricultural exports (table 6). Cuba's main agricultural exports to these countries were sugar, manufactured tobacco, and rum and tafia. From 2018 to 2020, China displaced the EU as the leading destination for Cuba's sugar exports based on the available data compiled by Trade Data Monitor (2024). However, Cuba's sugar exports to China declined from $170 million in 2020 to $89 million in 2021 and to $45 million in 2022. The decline in Cuba's sugar exports to China may reflect the general difficulties Cuba has faced importing inputs needed for agricultural production. When the scope of analysis was broadened to include agriculture related products, such as seafood, it became apparent that Cuba's trade with China has extended beyond sugar and tobacco. During 2020–22, China imported an annual average of $30 million of frozen rock lobster and other sea crawfish (HS-6 030611) from Cuba (Government of China statistics compiled by Trade Data Monitor, 2024).

Table 6

Agricultural imports from Cuba by the European Union, China, Switzerland, and the rest of the world, 2017–22

Importing country/product	2017	2018	2019	2020	2021	2022	Annual average, 2017-22
	U.S. dollars (millions)						
All countries							
Total, agricultural products	944	624	613	576	506	458	620
United States							
Total, agricultural products	0	0	0	0	0	0	0
European Union							
Total, agricultural products	347	232	210	200	210	186	231
Sugar, cane or beet	169	60	64	56	48	30	71
Tobacco, manufactured	68	69	63	66	72	70	68
Rum and tafia	67	66	53	51	57	52	58
Honey, natural	21	14	15	15	17	18	17
All other agricultural products not listed above	23	22	15	13	15	15	17
China, including Hong Kong and Macao							
Total, agricultural products	280	234	228	237	166	137	214
Cane sugar	210	153	158	170	89	45	138
Tobacco, manufactured	69	79	69	66	76	90	75
All other agricultural products not listed above	1	2	1	1	1	1	1
Switzerland							
Total, agricultural products	38	37	37	49	45	40	41
Tobacco, manufactured	31	31	32	44	41	36	36
All other agricultural products not listed above	7	6	5	5	4	5	5
Rest of world							
Total, agricultural products	278	121	137	91	84	94	134

Note: Trade values are measured in nominal (not inflation adjusted) dollars. The import statistics for the European Union (EU) are for the 27 current member states and do not include the United Kingdom, which left the EU on January 31, 2020.

Source: USDA, Economic Research Service calculations using U.S. Department of Commerce, Bureau of the Census data, as compiled by USDA, Foreign Agricultural Service, *Global Agricultural Trade System* database; and other national government data, as compiled by *Trade Data Monitor* database.

Conclusion

Since 2019, Cuba has been struggling to emerge from an economic downturn that has adversely affected its ability to import food, including agricultural products from the United States, as well as the inputs such as fuel and fertilizer that are needed to produce food domestically. To understand the impact of this downturn on food security in Cuba, the authors applied Economic Research Service's (ERS) International Food Security Assessment (IFSA) model to Cuba using food consumption data for 2020 and per capita Gross Domestic Product (GDP) estimates for 2023. This analysis indicates that in 2023, 12.8 percent of Cuba's population (1.4 million people) are estimated to have been food insecure, a condition defined as being unable to consume an average of 2,100 calories per capita per day. Cuba's per capita food gap for 2023 was estimated at 225 calories per day (42.6 kilograms per year), which corresponds to an overall food gap of approximately 41,000 metric tons for Cuba's entire food insecure population. A simulation considering a lower per capita GDP, based on the subregional average for the Caribbean, led to an estimated prevalence of food insecurity of 37.8 percent for 2023, equivalent to 4.2 million people.

Limited economic growth in Cuba, both at the macroeconomic level and in the agricultural sector, is the main factor behind the country's heightened level of food insecurity. From 2019 through at least 2023, Cuba's economy has seen little to no income growth, thereby reducing the general ability of the Cuban population to buy food regardless of whether it is produced domestically or imported. At the same time, Cuban agriculture's limited success in expanding domestic food production contributes to the country's limited income growth and increases the need to rely on imports to secure sufficient food for the country's population. In this context, U.S. agricultural exports to Cuba in 2021, 2022, and 2023 (measured in nominal dollars, i.e., not inflation adjusted) increased to levels that had not been seen since 2013 but were concentrated in a single commodity: chicken meat. Cuba's continued reliance on agricultural imports from the European Union, Brazil, and Vietnam, all relatively distant from Cuba when compared with the United States, reflects the limited economic relationship between the United States and Cuba.

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Appendix A

Synthetic prices

A synthetic domestic price, p_i^{ds}, that is linked to the world price, p_i^w, is created and expressed in Cuba's local currency as follows:

$$p_i^{ds} = \theta^* p_i^w * \left(1 + trc^{int}/\theta\right) * (1 + tariff/\theta) + trc^{dom}$$

where parameter θ is the price transmission slope and is assumed to equal 0.7. The parameter trc^{int} represents international transportation and market costs (e.g., cost, insurance, and freight (CIF) and freight on board (FOB)), which are assumed to equal 10 percent, and trc^{dom} represents domestic trade costs, which are assumed to equal $20.00 per ton in real terms. The tariff rates for Cuba's imports include barley (4 percent), cassava (4 percent), corn (5 percent), rice (10.5 percent), wheat (0.4 percent), and vegetable oils (6.7 percent) (World Bank, 2023).

Table A.1
Parameters used to calibrate rice (major grain) demand in Cuba, 2015 base year

Data	Unit	Value
Average total income	Real LCU per capita	679,844
Gini coefficient	Percent	42.1
Aggregate income elasticity	Unitless	0.482
Aggregate price elasticity	Unitless	-0.355
Average rice quantity consumed	Kilograms (kg) per capita	70.5
Consumer price, rice	Real LCU per kg	115

LCU = local currency units.

Note: Values for Cuba's elasticities (price and income) and Gini coefficient were not available, so this table used estimates based on the average for the Caribbean subregion. Domestic prices were calculated based on a price transmission equation and data from the FAO, Global Information and Early Warning System on Food and Agriculture's (FAO-GIEWS) *Food Price Monitoring and Analysis Tool*.

Source: USDA, Economic Research Service calculations using income data from USDA, Economic Research Service's *International Macroeconomic Data Set*; S&P Global's Market Intelligence database; and United Nations, Economic Commission for Latin America and the Caribbean's *Statistical Yearbook for Latin America and the Caribbean 2021*; income distribution data from World Bank; price and income elasticities were calculated following the methodology in Muhammad et al. (2011) and relied on data from the World Bank's 2011 International Comparison Program (ICP); consumption data from Food and Agriculture Organization (FAO) of the United Nations' *Food Balance Sheets* and *Cereal Balance Sheets*; and price data from FAO, Global Information and Early Warning System's (FAO-GIEWS) *Food Price Monitoring and Analysis Tool*.

Table A.2

Estimated 2023 food demand in Cuba in calories by income decile, 2015 base year

Decile	Unadjusted GDP scenario using ECLAC growth rate data		Adjusted GDP scenario using subregional average	
	GDP per capita per year (U.S. dollars)	Calories per capita per day	GDP per capita per year (U.S. dollars)	Calories per capita per day
1	1,492	1,825	1,103	1,513
2	2,350	2,057	1,739	1,699
3	3,140	2,247	2,322	1,852
4	3,686	2,369	2,726	1,951
5	4,404	2,518	3,257	2,074
6	5,382	2,707	3,981	2,229
7	6,384	2,884	4,722	2,377
8	8,125	3,163	6,010	2,611
9	10,780	3,531	7,974	2,926
10	22,035	4,591	16,299	3,892

ECLAC = United Nations, Economic Commission for Latin America and the Caribbean. GDP = Gross Domestic Product.

Note: GDP per capita is reported in 2015 U.S. dollars.

Source: USDA, Economic Research Service estimates using the International Food Security Assessment model.