



Economic impact of SARS-COV2 on Ecuadorian banana exports

Impacto económico del SARS-COV2 en las exportaciones del banano ecuatoriano

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Abstract

The banana agro-export sector as a catalyst for the Ecuadorian economy has prevailed for decades as the main agricultural item exported to international markets. This article presents an analysis of the behavior of exports and their economic impact caused between the periods established before and during the global pandemic of the SARS-COV2 virus in the year 2020, the total GDP and the agricultural GDP of Ecuador registered a decrease impact based on the elements linked to mobility restrictions, registering a decrease in GDP of 7.8% and a different behavior in the agro-exporting sectors such as bananas, which sustained growth based on the demand for bananas from the different international markets; Likewise, the present work reveals the perspectives of sustainability and post-pandemic competitiveness of banana exports.

Palabras clave: Competitiveness; market; trade; production; banana

Resumen

El sector agroexportador de banano como dinamizador de la economía ecuatoriana, prevalece hace décadas como principal rubro agrícola exportado a mercados internacionales. Este artículo presenta un análisis del comportamiento de las exportaciones y el su impacto económico ocasionada entre los periodos establecidos antes y durante la pandemia mundial del virus SARS-COV2 en el año 2020, al PIB total y el PIB agrícola del Ecuador registraron un impacto de decrecimiento en base a los elementos ligados a las restricciones de movilidad registrando un decrecimiento del PIB del 7.8 % y un distinto comportamiento a los sectores agro exportadores como el banano que sostuvo un crecimiento en base a las demanda de banano de los distintos mercados internacionales; así también, el presente trabajo da a conocer las perspectivas de sostenibilidad y competitividad pos pandemia de las exportaciones de banano.

Keywords: Competitividad; mercado; comercio; producción; bananan

INTRODUCTION

By the year 2020, humanity, when the first cases of SARS-COV caused by a new coronavirus occurred, began to implement epidemiological fences for identification and to promote an adequate reaction to the viral outbreak; initially spread from China and to the rest of countries worldwide. By mid-March, the World Health Organization (WHO, 2020) declared SARS-COV a pandemic with unfathomable nervousness for human health, which would cause countries worldwide with measures such as the closure of borders, with affectation directly to the commercialization of products between the different regions. In Latin America and the Caribbean, the first SARS-COV patients are discovered in the first days of March, causing slow and mandatory responses to prevent expansion, the main measure being the quarantine and confinement of people, favoring finding and/or or mitigate the spread of the virus. For Economic Commission for Latin America and the Caribbean (ECLAC, 2020) the COVID-19 pandemic impacted Latin American countries at a time of economic emergency, further aggravating social inequalities.

The unpredictable contexts of the pandemic cause a global crisis directly affecting the economy of the countries, even the positive results will not be reflected in improvements in their economies in a few years. World organizations in all economic, social and health fields continually change their predictions, trying to control the health pandemic quickly and in a timely manner to avoid increasing transmission spreads; and thus avoid the development of new variants of the virus with characteristics of greater resistance and speed of contagion among the population of various countries, including in countries with greater economic development where a growing contagion is already reflected in its population. Governments challenge the immunity of their population to promote a resurgence of their economies through mass vaccinations, projecting by the end of 2021 to achieve their goals; however, the global distribution of vaccines is preventing this goal from being achieved. In such a scenario, it has been reflected in a downward trend in global economic indicators such as Gross Domestic Product (GDP), balance of payments, exports, imports, investments and remittances, as the most affected; confirmed by the World Trade Organization (WTO) (Farías et al., 2021).

For the Food and Agriculture Organization-FAO & ECLAC (2020), the global health collapse caused by the unrecorded SARS-COV in the last hundred years has produced the greatest global economic crisis. Being the agri-food sector also hit by the effects caused by the remedial measures implemented by the different governments restricting the free movement of raw materials despite fulfilling the social function of basic necessity for humanity.

The economic activity of the countries has been reduced since the appearance of SAR-COV2, caused by the actions taken by governments at a global level to prevent and mitigate the spread of Covid-19. This decrease is the result of the low demand for products, with incidences in prices and in the volume of exports in international trade. For Ecuador, these actions were reflected in a drastic decrease in exports in the first quarter of 2020, a scenario that worried the country's economy, however, as of the

second quarter, the estimates reveal to be a little more positive, due to the increase in exports. Mining exports and the improvement in oil prices. According to **Jumbo, Campuzano, Vega and Luna (2020)** this increase in exports is expected to spread, and to continue this trend for future economic periods and thus boost the growth of the country's deteriorated economy.

If the exports of raw materials and partially finished products are fundamental pillars of an economy, it is certain that this will be directly affected by the variation in global prices, generating according to **Pacek (2008)** and **Alvarado, Ullauri & Benítez (2020)** an action unlikely to prevent a decline in trade momentum or even a emergency.

The considerable uncertainty about the effects, its severity and permanence of the pandemic, allows us to observe a panorama that is difficult to predict about the impact of COVID-19 on global markets today. The already existing complexities for the global procurement and trade of bananas and tropical fruits are limited, apart from being exposed to diversification of supply and demand, as well as numerous disturbances, including adverse environmental effects and legal changes; With COVID-19, the doubts about the information regarding the monthly data on the marketing chain, showing the export volumes in one month and the import volumes in another month, were further aggravated. Therefore, **Altendorf (2020)** states that it is important to maintain a continuous and indicative evaluation of the progress observed in global markets. Initially with provisional data and the indications of sources of the productive sector on the temporal evolution of the year 2020 where the trends are valued divergent in the world markets of bananas and tropical fruits, which seem to have been perceived as disturbed by the uncertainties of the respective trade in the market seasons and weather; beyond the apparent impact of COVID-19.

The Ecuadorian socioeconomic distribution is identified by its fragile industrial manufacturing, and by a late step of import replacement, achieving moderate results. In these contexts, the export of primary goods is established as a dynamic activity par excellence during the "opening out" phase, banana production continues to play a significant and strategic role for Ecuador. For this reason, this research work aims to publicize the impact generated during the first months of SARS-COV2 affectation in banana exports from Ecuador, using descriptive methods of comparative analysis.

Banana trade vs SARS-2

The complicated economic, social and political challenges that Ecuador faces before the pandemic. In the years 2017 and 2018 the Gross Domestic Product (PIB) showed moderate growth rates of 2.4% and 1.3%, respectively. This scenario was reflected in a deterioration of the employment structure; whose data are corroborated and estimated by UN Office for the Coordination of Humanitarian Affairs (**OCHA, 2020**). In 2019, the adequate employment rate decreased to 38.8%, in relation to the 42.3% registered in 2017. For the year 2019, the Afro-Ecuadorian population registered the best adequate employment rate with 32.9%, followed by 28.2 for the montubia and

15.1% for the indigenous population. For the same period, income poverty, including extreme poverty, reached 25% in 2019, with 17.2% in urban areas and 41.8% in rural areas; in relation to the year 2017, which reached 21.5%, 13.2% in the urban area and 39.3% in the rural area. Likewise, in households whose head is indigenous, 43.6% of income poverty was reached. The [ECLAC \(2019\)](#) at the end of 2019, projected the economic situation for Ecuador as a fragile scenario, with a growth rate of 0.1%. A lower tax collection in 2020 due to a decrease in economic dynamism and tax revenues would be affected as a result of the fall in the volume and cost of oil production below US\$20 per barrel, the level at which the country does not receive any income. Context that will lead to a GDP contraction of at least 6%, according to estimates by the [World Bank Group \(2018\)](#), International Monetary Fund and 7% by the government of Ecuador. The result of which is the impossibility of credit access to international markets, given indicators that have triggered the country risk to 4 715 points for the first quarter of 2019.

The Pan American Health Organization ([PAHO, 2020](#)) estimates that the workforce, transportation systems and supply chains may be affected based on the global impact generated by a pandemic influence on health. In other nations, the community could experience a food crisis as the impact of the virus before the influence causes serious health problems, causing general problems in the industry that depends on import and export, the difficulty of obtaining local supplies of food and the interruption of economic activities; these being some of the alterations given based on mobility restrictions to prevent the spread of the virus and contagion in the population.

According to [FAO \(2020\)](#) banana has become the main crop in the global agricultural production chain and with a large share in international trade. The rapid evolution and growth of the producing countries, the increased world demand for acquisition, The volumes of production and commercialization of banana cultivation have experienced a vertiginous increase in recent periods.

Given that the largest productive percentage of banana cultivation is carried out by small farmers informally, it is not feasible to obtain precise figures on world production. From the information available, it can be determined that between the years 2000 and 2002, the average production of bananas was 69 million tons, rising to 116 million tons in 2017 to 2019, valued at approximately 31 billion US dollars. The increase in the consumption needs of the banana fruit has become the main driver of the expansion of production in the producing countries. As a result, the increase in the global production of bananas was generated in the main producers, which are also large consumers, such as Brazil, the Philippines and, specifically, India and China. What causes in turn the increase in income and the progressive awareness of health aspects in buyers, has also favored the increase in demand. For reference, banana consumption has risen widely in the Russian Federation and the European Union. The producing states, given the growing demand, especially appealed to increase the area harvested. For example, in India the total area harvested in 2018 was 870 000 hectares when in the year 2000 it was 470 000, that is, an increase of 46%. India and China are among the countries that have promoted the greatest expansion of crop production. of bananas in recent years, in response to the vertiginous growth

of domestic demand, this increase has led to improvements in the use of technology such as irrigation systems; but also the fundamental contribution of nutrients and pesticides to the productive system of banana cultivation.

For the year 2019, banana exports worldwide increased by 10.2% compared to 2018, reaching a new historical maximum of approximately 21 million tons. Singularity that allows us to observe the values relative to the full year 2019, maintaining that this increase corresponded mainly to a dynamic increase in supply in Ecuador and the Philippines, these nations being the two main exporters. At the same time, a vertiginous expansion of Panama's exports is registered, benefiting from the extensive growth in supply as a result of the activation of a transcendental strip of banana production in the district of Barú. Additionally, the atmospheric scenarios attributed to the El Niño phenomenon continued to affect the exports of other key distributors, including Costa Rica and the Dominican Republic. For Latin America and the Caribbean, the export market grew in 2019 by 3%, reaching 15.1 million tons, due to a dynamic growth in cargo in several of the main exporters.

Ecuador, a country whose supply of bananas constitutes more than 40% of the region, reached an increase of almost 6.7 million tons for the year 2019, which represents an increase of 4.2% in banana shipments. Taking into consideration that the country experienced unfavorable conditions during the two four-month periods that hampered production, attributed to the El Niño meteorological event; however, the country increased its exports for the third consecutive year. This growth in banana exports was mainly due to the demand from China and Turkey, these countries being two important emerging markets for shipments of bananas from Ecuador. For the year 2019 in relation to the year 2018, supplies from Ecuador to Turkey increased by 42%, while banana billings to China rose by 73%, reaching approximately 460 000 tons, the result of which allowed the drop to be overcompensated almost 4% of exports to the Russian Federation. Additionally, in 2019, shipments from Ecuador benefited from the tariff reductions agreed upon in the agreements of the European Union and the Andean Community, allowing agility for imports from the European Union with a reduced rate of EUR 83 per ton throughout the year and helped the reported 61% increase in exports to the Netherlands (FAO, 2020).

The statements given by [Zuñiga, Restrepo, Osorio, Buendia and Muñoz \(2020\)](#) they allow us to understand the panorama to which the different productive and international banana trade links are subjected, given the different policies adopted by the governments of the different countries to reduce the expansion of covid-19 with measures to restrict mobility or partial or total closures through the application of quarantines, often causing supply chain interruptions. Crisis that further deepens the commercial conditions that were being observed, a null economic growth and an expiration of credit commitments that increasingly accumulates.

The production and export of bananas strengthens Ecuador with more than 220 thousand direct and indirect sources of employment, according to [Salazar \(2020\)](#) at the same time, it contributes to the income of foreign currency from the export of bananas in approximately 3 100 million US dollars per year, causing a genera-

tion for the country of 80 million in taxes and giving way to the development of the related industrial sector such as cardboard, plastic, shipping transport. and terrestrial, agricultural inputs, implementation of irrigation and drainage system technologies, in the same way the equipment, the commercial activities of aerial fumigation, ports, shipping companies, among others. The international trade of bananas generates more than 65% of the movement at the level of shipping companies and ports in shipping, allowing other sectors to benefit from jobs and generating their increase.

METHODOLOGY

In the present study, the descriptive methodology of scientific research was used, allowing to establish several processes whose purpose is to lead to the search of the approach through the application of quantitative and qualitative methods of banana exports, allowing to demonstrate the importance of the primary sector. banana and its contribution to the country's economy in times of pandemic caused by SARS-2.

RESULTS

Banana exports

By the end of 2019, Ecuador once again exceeds its banana export rates with 1.93% higher than in 2018, reaching the shipment of 357.4 million boxes of bananas (Salazar, 2020) (Asociación de Comercialización y Exportación de Banano-Acorbanec, 2020), its main destination with 27.85% the European Union, followed by the Russian Federation 21.87%; Middle East with 14.59%; United States 10.33%; East Asia 8.65%; Southern Cone 6.54%; Eastern Europe with 4.80%; Africa 3.84%; Oceania 1.02% and EFTA 0.35%. The placement of banana fruit worldwide is dynamic, according to records it is estimated that the European Union suffered a global reduction in imports of the fruit by 14%, largely in countries such as Germany, Italy and Belgium, caused by the Central American countries (especially Guatemala) that react to the recovery of the international market that Ecuador had given by the Trade Agreement, especially in the years 2017 and 2018, taking measures such as the reduction of average prices by US\$0.50 cents per box cheaper than Ecuador. Likewise, reductions were observed in the Russian Federation of 3% and the Southern Cone of 8.5%, however countries such as China and Africa demanded more fruit in the same periods, reaching 65% and 131% respectively.

If we focus on the year 2020 where the global impact of SARS-2 existed on the mobility of the population and food transportation; Banana exports maintained a sustained growth during the analyzed period, according to the data obtained from the exported boxes of 18.4 Kg between the years 2016 to 2020 of 19.24%. And 6.58% increase between what was exported between 2019 and 2020. All this at the entrance of new markets such as China, Russia, Turkey, among others; allowing to place a greater amount of banana production in these markets (Table 1).

TABLE 1.
Evolution of banana exports.

Year	Exported boxes of 18.4 kg	Variation	%
2016	319092 127	.	.
2017	326400 315	7 308 188	2.29
2018	350562 168	24 161 853	7.40
2019	357003 399	6 441 231	1.84
2020	380493 115	23 489 716	6.58

Source: **Acorbanec (2020).**

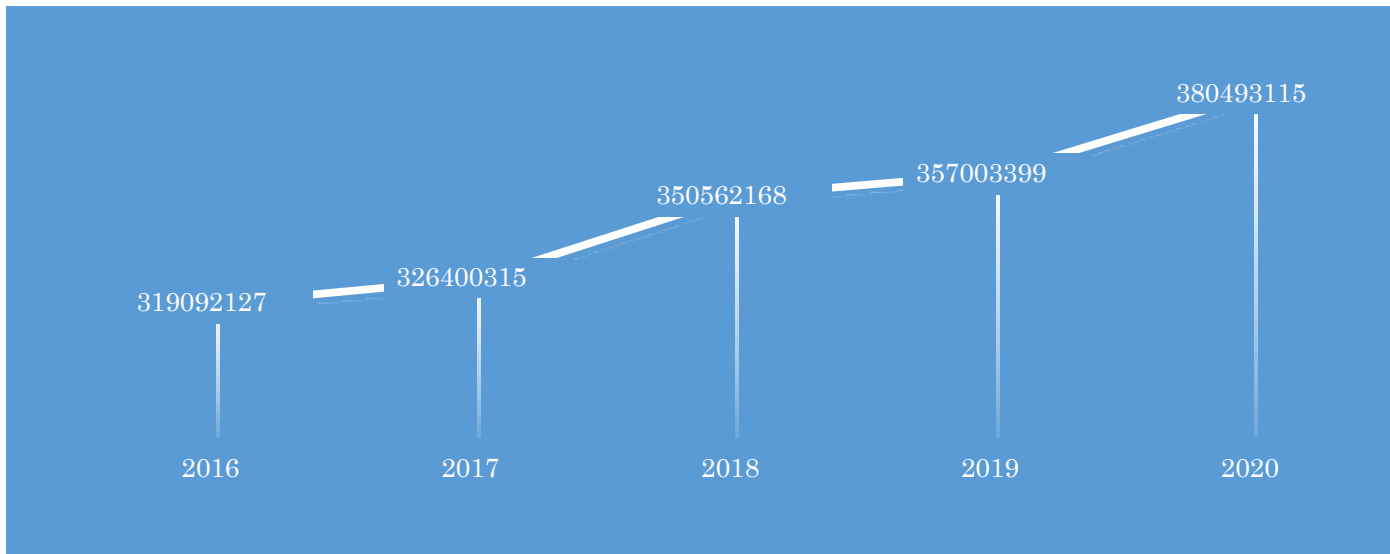


Figure 1. Banana boxes exported per year in millions.
Source: Author.

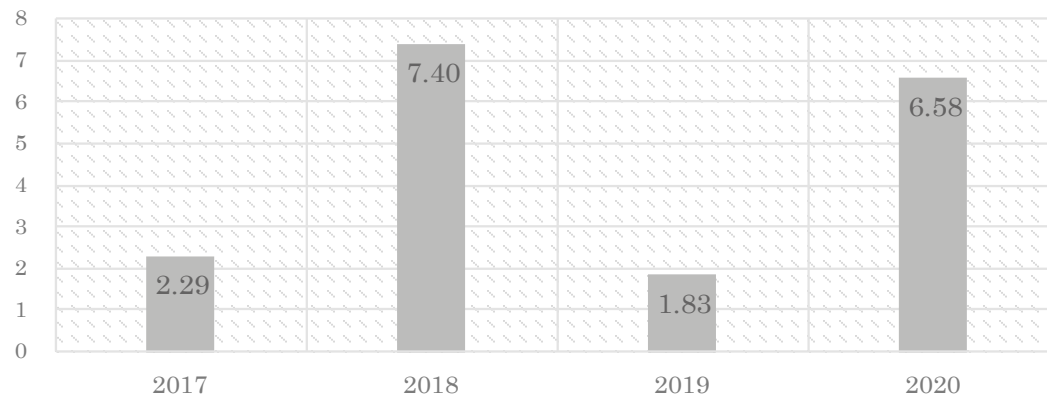


Figure 2. Percentage of annual growth of banana boxes exported.
Source: Author.

When visualizing in **Table 2** and in **Figure 3** and **Figure 4** the exports of banana boxes in the affectation of SARS-COV2 at a global level, Ecuador maintained its exports in average increase of the year 2020 of 6.58%, that is, 23 million 489 716 boxes of bananas more than in 2019. With the data obtained, it was possible to estimate that during the period from January to May 2020, where Ecuador reflected the greatest contagion of SARS-COV2, the largest volumes of banana exports were recorded.

TABLE 2.
Monthly banana box export variation.

Month	2019	2020	Variation	%
January	31 769 012	37 670 960	5 901 948	18.58
February	29 598 329	33 649 615	4 051 286	13.69
March	33 907 855	33 019 699	-888 156	-2.62
April	32 358 742	35 799 490	3 440 748	10.63
May	30 694 883	35 450 941	4 756 058	15.49
June	29 060 296	28 377 658	-682 638	-2.35
July	25 688 739	26 356 694	667 955	2.60
August	27 265 904	30 321 514	3 055 610	11.21
September	27 990 986	26 338 188	-1 652 798	-5.90
October	25 487 081	28 122 246	2 635 165	10.34
November	30 725 737	32 373 667	1 647 930	5.36
December	32 455 835	33 012 443	556 608	1.71
Total	357 003 399	380 493 115	23 489 716	6.58

Source: **Acorbanec (2020)**.

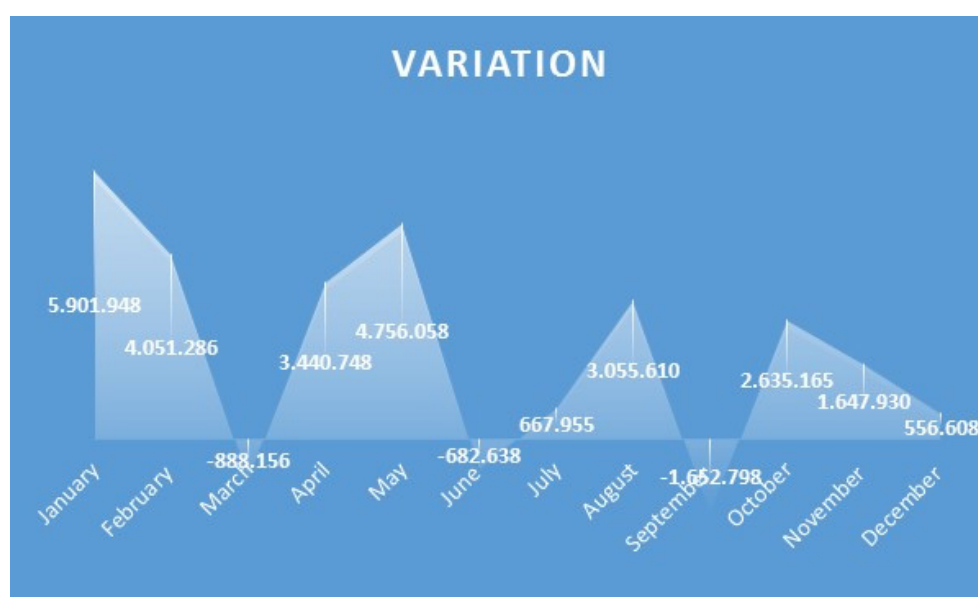


Figure 3. Variation of boxes exported year 2019 vs year 2020.
Source: Author.

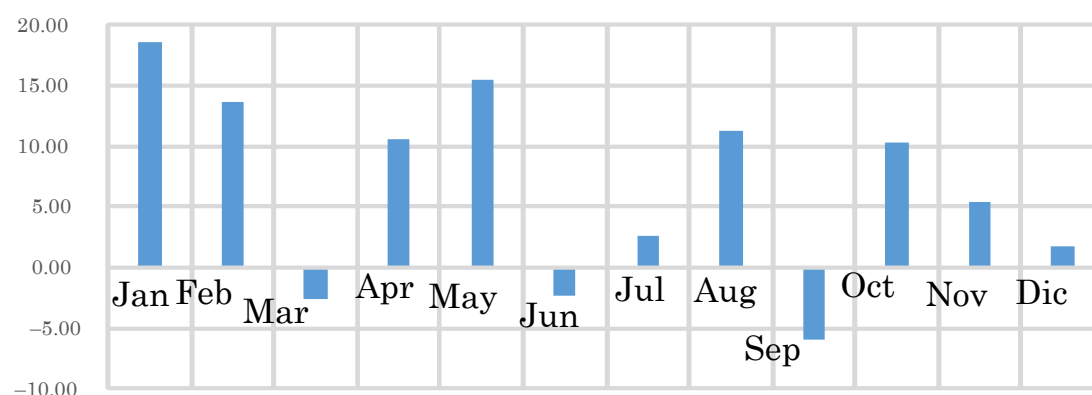


Figure 4. Percentage of monthly variation of exports of banana boxes 2019 vs. 2020.
Source: Author.

The sustainability of exports of primary products is due to the demand of international markets, however it is extremely important to emphasize in Ecuador and the rest of the countries during the pandemic, the paralyzing of the production chain and the export of food products was avoided. For the year 2020 these remained on the rise given the importance of being able to provide a food chain to the population in a variety way in the pandemic caused by SARS-COV2. In **Table 3** and **Figure 5**, **Figure 6** and **Figure 7** it can be seen that the traditional markets for banana fruit demand were sustainable and on the rise during the year 2020.

TABLE 3.
Destination market for banana exports.

Destinations	2019	2020	Variation	%
European Union (27)	92 058 376	100 835 237	8 776 861	9.53
Russia	75 542 650	76 465 173	922 523	1.22
Middle East	53 054 136	59 418 610	6 364 474	12.00
United States	37 095 896	36 895 832	-200 064	-0.54
Eastern Asia	29 425 384	26 676 428	-2 748 956	-9.34
Southern Cone	23 368 742	25 829 756	2 461 014	10.53
Eastern Europe	17 532 846	21 287 918	3 755 072	21.42
Africa	16 874 856	21 032 833	4 157 977	24.64
United Kingdom	6 516 247	6 612 449	96 202	1.48
Oceania	3 768 392	3 523 154	-245 238	-6.51
Efta	1 765 874	1 915 725	149 851	8.49
TOTAL	357 003 399	380 493 115	23 489 716	6.58

Source: **Acorbanec (2020)**.

Banana Destination

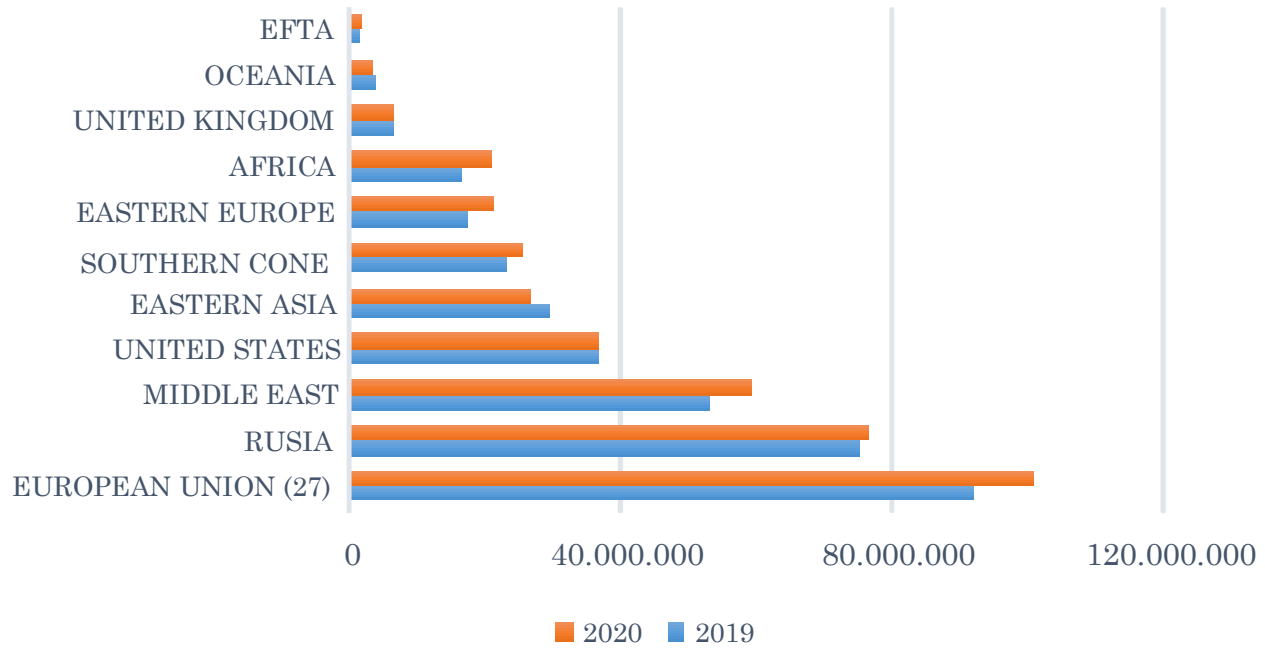


Figure 5. Destination markets for bananas in 2019 and 2020.
Source: Author.

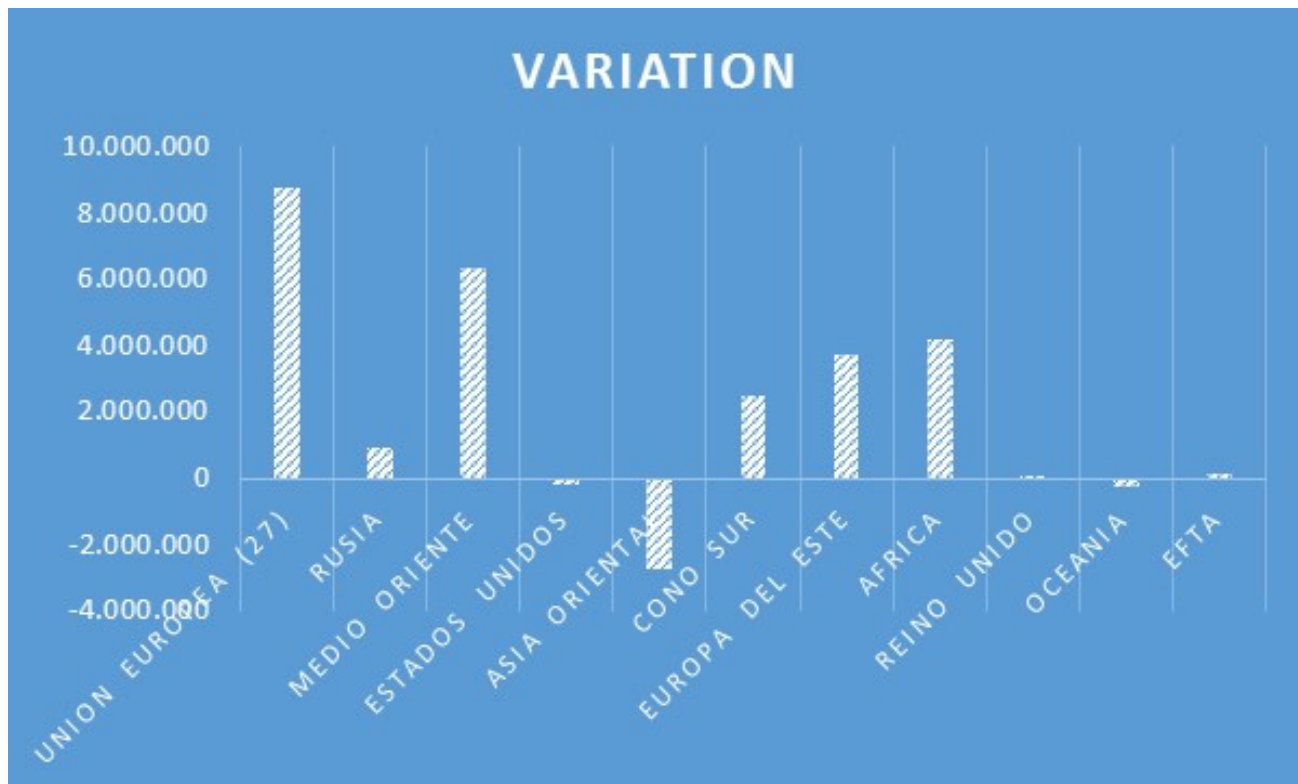


Figure 6. Variation of the increase in banana box exports 2020 vs 2019.
Source: Author.

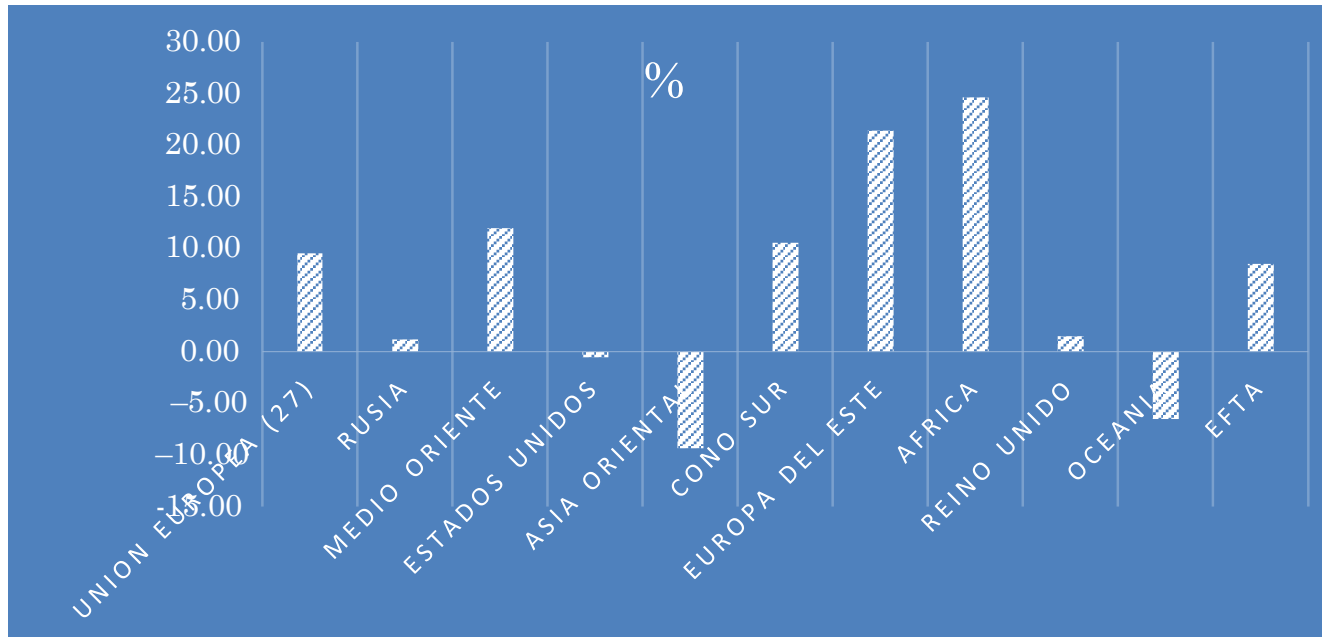


Figure 7. Percentage Variation of the increase in banana box exports 2020 vs 2019.
Source: Author.

Economic impact of SARS-COV2 measures on exports and their effect on GDP

SARS-COV2 worldwide has shown not only to generate a health crisis; the disease is accompanied by human losses with incalculable economic repercussions in the countries, due to palliative measures to manage the contagion.

The negative indices of poverty and food security are reflected worldwide, according to estimates by the United Nations agency for achieving food security (FAO, 2020): Poverty will increase by 548 million inhabitants and food insecurity by 183 million people. For Latin America and the Caribbean, an increase of 4.4% in poverty is expected, reaching 83.4 million people, reaching 15.22% of the global population.

The consequences of the impact generated by SARS-COV2 on banana exports and its effect on the agricultural sector and therefore on the national GDP, have a direct incidence derived not only from the virus; but because of the restrictive mobility measures adopted by Ecuador and other countries worldwide.

For many decades we have argued about the potential of the country, based on the 5.1 million hectares dedicated to different agricultural and livestock activities, according to the statistical survey of the investigation of areas and continuous agricultural production (Instituto Nacional de Estadística y Censos-INEC, s.f. [Encuesta de Superficie y Producción Agropecuaria Continua-ESPAC, 2019]). The distribution of agricultural areas at the national level is concentrated in 5.1 million hectares in charge of producers of permanent crops, transitory, cultivated and natural grass; and 7.2 million hectares without agricultural use, mountains,

forests, moors, rest and other non-agricultural uses. The sugar cove, the banana and the African palm occupy the largest national production of permanent crops with a participation of 28.20% of the agricultural area, with the cultivation of grass being the one with the largest participation with 38.85%; cattle lead the livestock sector with approximately 4.3 million head nationwide, whose highest concentration with 21.6% is concentrated in the province of Manabí; followed by poultry production with 10.20 million hens nationwide with 87.63% laying hens and 12.30% breeding hens.

According to official data from the Central Bank of Ecuador (BCE, 2020), the agricultural sector of Ecuador is of transcendent importance, ranking with exports as the second sector that generates foreign exchange for the sustainability of the country's economy, not only the contribution to the GDP, is of great importance if not also because of the number of people who work in this sector, which according to data represents around 29.4% of the employed population. It also plays a valuable role in the global perception of food security, accounting for at least a fifth of the country's production of goods and services.

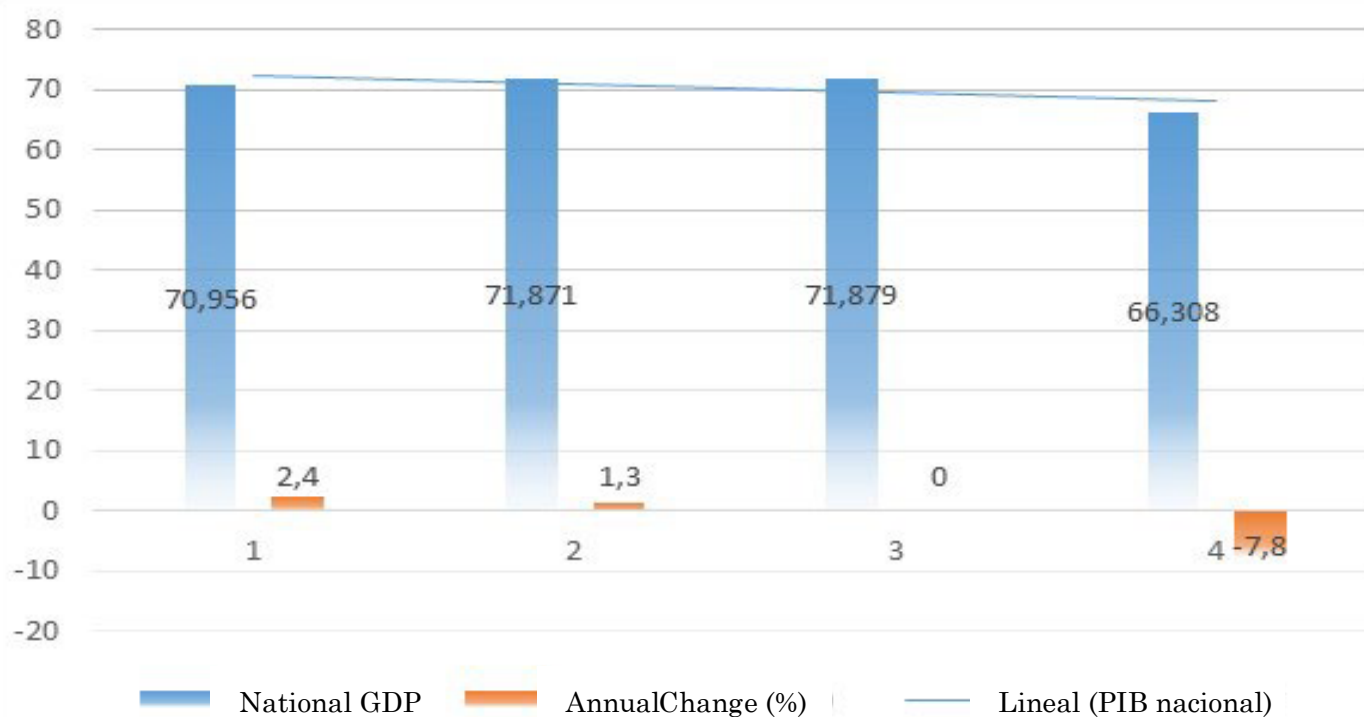


Figure 8. National GDP and annual variation 2017 to 2020.
Source: Author.

In the national accounts published by the Central Bank of Ecuador, it was observed that in the first three months of 2020 there was a decrease of 2.4% compared to the same period in 2019 (Figure 8). Exports of goods and services reported an increase of 3.6% in the first quarter of 2020 in relation to 2019 (Figure 8). The

products that revealed a positive performance in annual external sales, according to their relevance, were: 1.2% crude oil; 11.8% processed shrimp; 9.3% banana, coffee and cocoa; and fish with other aquatic products 0.9%. While the activity in terms of imports was less than that of exports, reaching an increase of 0.2% compared to the first three months of 2019. The greatest demand for products abroad was: refined petroleum oils with 4.2% (interannual import of derivatives was 15.3%); 24.6% in other agricultural products; and 15.3% in financial intermediation services.

Shrimp fishing and aquaculture

With respect to the first quarter of 2019, this sector registered a positive variation rate of 7.7%, caused by the greater demand of the international market, reaching an annual growth of 19%, as well as the improvement in the use of technology, managing to increase more larvae in swimming pools.

Agriculture

Although this sector showed a growth of 1.4% in the first three months of 2020, the increase in the cultivation of bananas, coffee and cocoa stands out with 7.3% and 2.7% for the cultivation of flowers.

Fishing

The increase in exports of fish and other aquatic products was observed by 3.4%. Globally, 80% of the total primary fishery is destined for exports, which generated an increase of 1.1% in the Gross Value Added (GVA) for the first quarter of 2020.

Manufacture

In order of importance, the processing and conservation of fish, the manufacture of common metals, the manufacture of beverages, the processing and conservation of shrimp, the manufacture of paper, among others in the manufacturing industry, had a positive performance of its GVA in the first quarter of the year. year 2020 with a slight increase of 0.1% compared to the same period in 2019.

Trade

The behavior of the performance of the industries was directly related to a negative variation of the Gross Value Added (GVA) of 0.9%.

At the end of the year 2020, the impact of SARS-COV2 was generalized in the most productive part of the country's economy, however those related to the agricultural productive sector had a positive contribution during this year and among them the banana export sector as we can observe in [Table 4](#).

TABLE 4.
Variaciones por ramas de actividad económica.

Branches of activity	2019	2020
Aquaculture and shrimp fisheries	12.10%	2.70%
Accommodation and food services	2.30%	-20.20%
Construction	-5.20%	-16.00%
Cultivation of bananas, coffee and cocoa	-0.50%	2.30%
Elaboration of milling products, bakery and noodles	1.80%	5.30%
Dairy processing	3.10%	3.60%
Mining and quarrying	-2.50%	12.10%
Manufacture of transport equipment	-9.40%	-32.50%
Manufacturing industries ncp	2.40%	-19.70%
Shrimp processing and conservation	10.00%	5.60%
Transport and storage	1.10%	-21.00%

Source: [Lucero \(2020\)](#).

CONCLUSIONS

During the periods of greatest contagion of SARS-COV2 in Ecuador, it was possible to determine that banana exports maintained their growth due to the demand of new markets and that the restrictive measures given by the different control agencies of the spread of the disease, they did not cut off mobility for the supply of food and the export chains of agricultural and livestock products to foreign markets; determining that they had a positive impact on banana exports in the first months of 2020. The opposite was the case at the end of the same year, when restrictions began to be generated in international ports due to lack of personnel.

Given the scenarios provided at a global level by SARS-COV2 and the sustainability value of the country's agri-food system and especially the banana export sector, urgent measures are required for the true agricultural transformation for the benefit of the producer and the farmer, take advantage of the accelerated innovation of ICTs in Productive Systems. Such as: optimizing food security and social protection; preserve family farming; safeguard alive the food chain and fair trade; strengthen world trade; curb inflation.

DECLARATION OF AUTHORSHIP

Mostadt: Conceptualization, Methodology, Software, Validation, Formal analysis, Research, Data curation, Writing-Original draft, Writing-Proofreading and editing, Visualization.

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REFERENCES

- Acorbanec.** (2020). Evolucion de exportaciones ecuatorianas de Banano a Diciembre de 2020. [Online]. Disponible en <https://acorbanec.com/>
- Altendorf, S.** (2020). Evaluación preliminar del impacto de la pandemia de la COVID-19 en el comercio de bananos y frutas tropicales. En, FAO, *Perspectivas Alimentarias. Resúmenes de mercado* (pp. 10–16). Roma: FAO. Recuperado de <https://www.fao.org/documents/card/es/c/cb2968es/>
- Alvarado, M., Ullauri, N. & Benítez, F.** (2020). Impact of primary exports on the economic growth of Ecuador: econometric analysis from Cobb Douglas, period 2000-2017. *INNOVA Research Journal*, 5(1), 206–217. <https://doi.org/10.33890/innova.v5.n1.2020.1140>
- BCE.** (2020, 30 septiembre). La economía ecuatoriana decreció 12, 4% en el segundo trimestre de 2020. [Online]. Disponible en <https://www.bce.fin.ec/index.php/boletines-de-prensa-archivo/item/1383-la-economia-ecuatoriana-decrecio-12-4-en-el-segundo-trimestre-de-2020>
- ECLAC.** (2020). *Report on the economic impact of coronavirus disease (COVID-19) on Latin America and the Caribbean*. Santiago: ECLAC. Available: <http://hdl.handle.net/11362/45603>
- ECLAC.** (2019). *Preliminary Overview of the Economies of Latin America and the Caribbean*. Santiago: ECLAC. Available: <https://www.cepal.org/en/publications/45001-preliminary-overview-economies-latin-america-and-caribbean-2019>
- ECLAC & FAO.** (2020). *Food systems and COVID-19 in Latin America and the Caribbean. Health risks, safety of workers and food safety*. Rome: Economic Commission for Latin America and the Caribbean/ Food and Agricultural Organization. Available from <http://www.fao.org/3/ca9112en/CA9112EN.pdf>
- FAO.** (2020). *Análisis del Mercado del Banano 2019*. Roma: Organización de las Naciones Unidas para la alimentación y la Agricultura. Recuperado de <http://www.fao.org/3/cb0168es/cb0168es.pdf>
- Farías, R., Muñoz, L., Marcillo, C., Viteri, M., Vinueza, J., Galarza, C. y Cevallos, J.** (2021). *COVID-19: Impacto en las exportaciones de organizaciones de pequeños productores afectaciones, desafíos y oportunidades*. Guayaquil: Ministerio de Producción, comercio exterior, inversiones y pesca. Recuperado de <https://www.produccion.gob.ec/wp-content/uploads/2020/12/Doc-completo-Impacto-Exportaciones-EPS.pdf>

- INEC. (s.f.). Encuesta de Superficie y Producción Agropecuaria Continua – ESPAC. [Bases de Datos]. Disponible en <https://www.ecuadorencifras.gob.ec/encuesta-de-superficie-y-produccion-agropecuaria-continua-bbd/>
- Jumbo, D., Campuzano, J., Vega, F. y Luna, Á. (2020). Crisis económicas y Covid-19 en Ecuador: impacto en las exportaciones. *Revista Universidad y Sociedad*, 12(6), 103–110. Disponible en <https://rus.ucf.edu.cu/index.php/rus/article/view/1883>
- Lucero, K. (2020, diciembre 2). La economía de Ecuador perderá \$ 10.659 millones en el 2020. *Revista Gestión*. Disponible en <https://www.revistagestion.ec/economia-y-finanzas-analisis/la-economia-de-ecuador-perdera-10659-millones-en-el-2020>
- OCHA. (2020). *Global Humanitarian Response Plan: COVID-19. GHRP July uptade*. Geneva: UN. Available: <https://reliefweb.int/report/world/global-humanitarian-response-plan-covid-19-april-december-2020-ghrp-july-update-enar>
- Pacek, N. (2008). *Oportunidades en los mercados emergentes*. Buenos Aires: Cuatro Media.
- PAHO. (2020). *Tool 7. Food security in a pandemic*. Washington D.C: Pan American Health Organization. Recuperado de https://www.paho.org/disasters/dmdocuments/RespToolkit_14_Tool%2007_FoodSecurityinaPandemic.pdf
- Salazar, R. (2020, marzo 11). 2020 grandes desafíos para el Banano y el efecto Coronavirus. *El Productor*. Disponible en <https://elproductor.com/2020/03/2020-grandes-desafios-para-el-banano-y-el-efecto-coronavirus/>
- WHO. (2020, 11 March). WHO Director-General’s opening remarks at the media briefing on COVID-19-11 March 2020. [Online]. Available: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
- World Bank Group. (2018). *Ecuador. Systematic Country Diagnostic*. Washington, DC: World Bank. Available: <http://hdl.handle.net/10986/30052>
- Zuñiga, L., Restrepo, L., Osorio, R., Buendia, J. & Muñoz, H. (2020). The Global Economy in Time of Covid-19 Crisis. *Revista Espacios*, 41(42), 381–387. <https://doi.org/10.48082/espacios-a20v41n42p33>

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