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**COMPETITIVENESS OF THE ECUADORIAN SHRIMP  
SECTOR TOWARD THE EUROPEAN UNION FROM 2015 -  
2022**

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## **DEDICATION**

This work is dedicated to my parents, siblings, and grandparents, who have constantly supported me in my personal and academic development. Without a doubt, without their support, it would have been complex to fulfill one of my life's aspirations, which is the attainment of my professional degree.

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## **ABSTRACT:**

The Ecuadorian shrimp farming sector is highly competitive in the European market due to the quality of its products and high production standards. Ecuador is one of the largest exporters of shrimp to the European Union and continuously growing in recent years, which has allowed it to increase its market share in international markets. The objective of this study is to evaluate the competitiveness of the Ecuadorian shrimp farming sector in the European Union from 2015 to 2022 to identify the factors that have contributed to its development. The methodology used was a document review, and included accessing bibliographic sources, statistics from newsletters, and prestigious sites to conduct a reliable and impartial analysis. Competitiveness indicators such as the revealed comparative advantage (RCA) or Balassa index, the relative advantage of exports (REA), and the competitiveness map were also applied to demonstrate the competitiveness of the Ecuadorian shrimp farming sector in the European Union. It was concluded that Ecuador has competitive advantages that position it as the world's leading shrimp exporter in 2022. This is due to the country's level of specialization in its production and logistics activities, reflected in its leadership in the Ecuadorian non-oil export sector.

**Keywords:** Shrimp, shrimp sector, competitiveness, revealed comparative advantage (RCA), relative export advantage (REA), competitiveness map.

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## **Introduction**

### **Problem Statement**

The Ecuadorian shrimp industry produces a high-quality product, which means that the country needs high levels of competitiveness to capitalize on international market demands and improve the trade balance at both the corporate and national levels. Ecuadorian companies strive to ensure their products satisfy international requirements by meeting the specific standards of the global market, thereby maintaining competitive advantages over countries such as India and Indonesia, which stand out as the world's largest shrimp producers (Infopesca, 2023).

Ecuador remained one of the most significant shrimp-exporting nations even in 2019, ranking third globally. The primary destinations for Ecuadorian products include the United States, Germany, and China, among others (Rodríguez P. D., 2020).

According to statistics from the Ecuadorian Central Bank (2023) in 2022, shrimp became the country's leading non-oil product, with revenues reaching US\$ 7,289.3 million. This figure represents 34.6% of traditional product exports, marking a record milestone for the shrimp sector. Based on information provided by the According to the National Chamber of Aquaculture (2023), the main destination is China with 56%, followed by the United States (18%), Europe (17%), the Rest of Asia (6%), America (2%), and Africa (1%). Within Europe, Spain, France, and Italy are the largest importers of Ecuadorian shrimp (Datos Macro, 2023).

The European Commission (2022) indicates that European consumption of shrimp and prawns stands at 1.46 kg per capita, which ranks below tuna (3.06 kg), salmon (2.44 kg), and cod (1.72 kg). Nevertheless, Ecuador stands out as one of the primary shrimp suppliers, followed by India, Vietnam, Thailand, and Indonesia.

A central element of this study's problem statement is the determination of the competitive levels of the Ecuadorian shrimp sector compared to other international crustacean suppliers. This information is essential for establishing future strategies to sustain the growth that has positioned this vital product in the foreign market. To achieve this, specific indicators were used to measure the competitiveness levels of this sector within the European Union market: the Revealed Comparative Advantage (RCA)—commonly known as the Balassa Index—the Relative Export Advantage (RXA), and the Competitiveness Map. These results aimed to demonstrate the competitiveness of the Ecuadorian shrimp sector in the European Union, providing a framework to address the challenges and opportunities within the process.

### **Research Question**

What factors have contributed to the competitiveness of the Ecuadorian shrimp sector in its trade relationship with the European Union from 2015 to 2022?

## **General Objective**

To evaluate the factors that have contributed to the competitiveness of the Ecuadorian shrimp sector in its trade relationship with the European Union from 2015 - 2022.

## **Specific Objectives**

1. To diagnose the current situation of the Ecuadorian shrimp sector.
2. To analyze the competitors and the characteristics of the European shrimp market.
3. To evaluate the competitiveness and comparative advantage of the Ecuadorian shrimp sector.

## **CHAPTER 1**

### **1. THEORETICAL FRAMEWORK**

#### **1.1 Conceptual Theoretical Framework**

##### **1.1.1 International Trade**

International trade is an economic phenomenon that plays a key role in globalization, significantly impacting the development of nations. According to the World Trade Organization (2023), international trade refers to the purchase and sale of goods, services, and investments across borders between different countries or regions. A similar definition is presented by Salazar et al. (2020), who describe it as the exchange of goods and services between two or more nations with the aim of fostering trade balance growth and generating economic income that contributes to socioeconomic development. In this manner, countries possess legal frameworks that must be executed in accordance with trade agreements.

In an increasingly interconnected world, international trade has become a key tool for economic growth and national development. By facilitating the exchange of goods and services, international trade allows countries to obtain products they cannot produce themselves, thus enabling greater diversity and access to higher-quality goods (Guayasamín et al., 2019). Furthermore, international trade fosters competition among companies, leading to increased efficiency and a reduction in prices for consumers.

Accordingly, Suriaga and Hidalgo (2021) consider that international trade involves the interaction between different countries through the exchange of resources ranging from basic goods and services to the transfer of technology, knowledge, and information. This type of trade plays an important role in the economic development and growth of each involved country, representing a significant contribution to their respective economies.

For the development of foreign trade, international regulations are fundamental to ensuring fair and equitable commerce. The World Trade Organization (WTO) is the body responsible for establishing and supervising these rules through multilateral agreements that regulate trade

among member countries. These agreements establish clear rules on aspects such as customs duties, trade barriers, and intellectual property, among others. This situation has fostered foreign trade, which, according to Muñoz (2019), has been a product of multilateral agreements and international institutions such as the General Agreement on Tariffs and Trade (GATT) and the WTO, which have promoted trade among their member nations. Consequently, international trade plays a vital role for a country, as it allows access to products or services from other nations and contributes positively to the country's economic growth.

In international trade, various theories explain the benefits countries gain from participating in it. One of the most influential theories is the Theory of Comparative Advantage, proposed by David Ricardo (Garcés, 2015). According to this theory, countries benefit by specializing in the production of those goods in which they are most efficient and then exchanging them with other countries. This allows for the exploitation of cost differences and increases overall global efficiency.

According to Mulder and Pellandra (2017), exporting companies in South American countries must focus on innovation, as this relationship allows them to enter new markets while avoiding those that are already saturated. It is important for organizations to diversify or add value to their products to find new market niches where unsatisfied demand may be concentrated. For this reason, exporting sectors must generate policies aimed at avoiding the concentration of the export basket, destination markets, and exporting companies.

Thus, as indicated by Correa et al. (2022), international trade is a beneficial mechanism from a socioeconomic, technological, and political perspective; therefore, countries must encourage companies to place their products or services in the foreign market, which strengthens national economies.

It is important to recognize that the world is currently in a post-pandemic stage after experiencing financial and trade restrictions and Latin America was no exception. For Cámara and Sangiacomo (2021), a large part of foreign trade depends on the export of raw materials, and the closing of borders, especially by one of its main trade partners, China, caused products to fail to reach their destination markets.

In conclusion, international trade continues to be an essential engine for economic growth, yet it faces constant challenges and changes in a post-pandemic context and through technological evolution. Adaptation to these transformations are fundamental for sustainable and equitable development in the era of global interconnection.

### **1.1.2 Competitiveness**

According to the Real Academia Española (RAE, 2024), competitiveness is defined as the capacity to compete and the rivalry in pursuit of an objective. In all commercial sectors, many companies or micro-enterprises carry out the same activities, such as the sale of goods and services. In this sense, market competition is based on the quality of the services or resources

offered. Therefore, in the management of every organization, it is important to consider that, beyond merely competing, the primary goal is to achieve greater profitability.

According to Medeiros et al. (2019), the literature defines a firm's efficiency through performance, which is characterized by its ability to develop competitive strategies that allow it to maintain or increase its market share in a sustainable manner.

Furthermore, competitiveness refers to the ability to remain in the productive market over time, adapting to resources that continue to evolve in the current era of globalization. As stated by Sierra et al. (2019), this implies the need to develop an improved organizational, administrative, and legal structure to ensure the organization's vision is centered on being competitive against the adversities of its environment.

Competition in the business sphere involves the strategy companies employ when offering their products and services to the market. This strategy influences how various companies engaged in the same production target their audience, presenting their products attractively and seeking to offer superior alternatives to those existing in the market, rather than seeking to harm the competition (Sarmiento & Delgado, 2020).

### **1.1.3 Theories of Absolute, Comparative, and Competitive Advantage**

Guayasamín et al. (2019) explain that the Theory of Absolute Advantage, formulated by the economist Adam Smith in 1776 in his renowned work "*The Wealth of Nations*," remains one of the pillars of classical economic thought today. According to Smith, countries acquire an absolute advantage over other nations when they produce goods or services efficiently.

Smith suggests that if countries specialize in optimal production at lower costs, they obtain an absolute advantage, trading their goods with competitive advantages. This occurs because countries invest in goods in which they are more productive, which is reflected in the increased sales of said products, contributing to the economic development of nations.

Regarding the Theory of Comparative Advantage, Ricardo (1817) points out that countries manage to specialize in the production of goods even without absolute advantages, requires the product to be manufactured at the lowest possible cost to face other nations within international trade (Garcés, 2015). In this way, the author considers that a country can produce a product efficiently even without an absolute advantage, as proposed by Smith, making it vital for nations to specialize in certain products to stand out within international trade, thereby contributing to the socioeconomic development of countries (Guayasamín et al., 2019).

It is essential to examine the concept of competitiveness according to Porter (2015), who highlights that competitiveness has brought about a transformation in information and economic theories, leading to significant changes in the actions of business managers. According to Porter's theory, the recognition of information is a determining factor in economic decisions, and his theories hold considerable potential. In this sense, value is considered the primary generator of costs associated with creating a product, seeking a strategy that produces

value-added while considering the costs necessary to achieve it, thus contributing to the company's competitiveness.

### **1.1.4 Measuring Competitiveness**

Measuring competitiveness in companies is a crucial aspect of their success and survival in today's increasingly globalized and competitive market. Through the measurement of competitiveness, companies can identify their strengths and weaknesses compared to their competitors and make strategic decisions to improve their market position.

There are different approaches and methodologies for measuring corporate competitiveness, but they all share the objective of evaluating a company's capacity to compete effectively in its business environment. For Ajila and Zamora (2022), some of the most common metrics used to measure competitiveness include market share, sales growth, profitability, and customer satisfaction levels.

The foreign exchange rate is a variable that must be considered by both exporters and importers. As indicated by Valdivieso and Arias (2017), an increase in the dollar's value compared to the national currencies of other countries leads to dollar appreciation, which results in a loss of competitiveness. Conversely, dollar depreciation leads to improved competitiveness in the foreign market for products originating from Ecuador.

Market share, according to Ajila and Zamora (2022), is a fundamental measure of a company's competitiveness, as it indicates the portion of the market the company holds compared to its competitors. A higher market share indicates a greater ability of the company to satisfy customer needs and compete successfully. To measure this metric, various methods can be used, such as surveys, data analysis, and price comparisons.

Sales growth is another important indicator of a company's competitiveness. For Sarmiento and Delgado (2020), it shows the capacity to increase revenue and expand market presence. Higher sales growth may indicate greater demand for the company's products or services and a superior capacity to meet customer needs. According to García (2022), to measure this metric, different approaches can be used, such as sales trend analysis, the identification of new markets, and the implementation of effective marketing strategies.

According to Sarmiento and Delgado (2020), Profitability as a metric demonstrates the company's ability to generate profits and obtain an adequate return on investment. Higher profitability indicates greater efficiency in managing company resources and a superior ability to compete in the market. Luna et al. (2021) points out that to measure this metric, different tools can be used, such as cost analysis, evaluation of operational efficiency, and profit comparison with competitors.

Lastly, the customer satisfaction level shows the firm's ability to meet the expectations and needs of its clients. For Becerra et al. (2022), a higher level of customer satisfaction indicates greater customer loyalty and retention, which in turn can lead to increased sales growth and

profitability. To measure this metric, different approaches can be used, such as customer satisfaction surveys, feedback analysis, and tracking customer loyalty.

In conclusion, measuring competitiveness in companies is essential for evaluating their market position and making effective strategic decisions. Through metrics such as market share, sales growth, profitability, and customer satisfaction levels, companies can identify areas for improvement and develop strategies to increase their competitiveness. By measuring competitiveness regularly and continuously, companies can adapt quickly to market changes and maintain their long-term competitive advantage.

### **1.1.5 Competitive advantages of the Ecuadorian shrimp sector**

Despite the limited existence of studies on the competitive advantages of the Ecuadorian shrimp sector, there are determining factors that influence its development. This involves highlighting the need to create local actions where micro-enterprises incorporate competitiveness as a key element for the business world, given its connection to the market, environment, and society. These theories become an important tool for establishing a clearer horizon to follow and achieve proposed objectives (Torres et al., 2018).

Focusing on the importance of competitive advantage contributed by Porter (1985), one of the author's greatest achievements regarding his successful performance as a strategic advisor to several global multinationals where he provided the following advantages:

- Better control of the business plan.
- Improved company programming.
- Enhanced possibility of conducting effective market research.
- Improved management capacity resulting from more precise market measurement.

His contributions were well received; however, considering the failure of his own firm, other economic experts engaged in serious discussions on the matter. In any case, it is important to note that Porter himself, in 1990, emphasized that generic competitive strategies had to be more dynamic to adapt to the conditions imposed by the market.

From another perspective, Rojas (2019) mentions that within the scope of dealing with people, it is necessary to analyze how objects are part of the production process. This includes developing concepts where people, as subjects endowed with intelligence, projects, and desires, must be satisfied by the goods or services the company offers. In other words, organizations must provide training, encouragement, and motivation so that employees align with what is proposed. Furthermore, from a strategic standpoint, it is clear that intellectual capital is vital; therefore, it provides competitive advantages that lead to better levels of growth and productivity.

Organizations must find their own advantages when competing in the market. Among the consequences of changes in the commercial sector, it may be said that the pandemic influenced a decrease in sales of non-essential products. However, entrepreneurs have had to find strategies to address the decline in demand (both national and international), which is a major

problem to face due to the containment regimes imposed in many countries (García et al., 2021).

Consequently, there are advantages in terms of cost, product differentiation, response, and technical progress of strategies. The capacity and performance of the company must be coherent with competition patterns because they define the basis of competition itself. It is possible to consider that, depending on the sector, it will appear more competitive; therefore, advantages will be displayed according to the creativity and capacity of the firm.

According to Varela et al. (2017), the shrimp sector has emerged as one of the primary sources of economic income for the country, ranking first after bananas as a non-oil export item. This industry involves approximately 200,000 families in the country, as well as various related businesses, including larva breeding laboratories, transportation services, packaging companies, factories, and supply distributors.

Another competitive advantage for Ecuador is multilateral agreements which, according to Martínez and Ajila (2022), have provided the opportunity to supply the European market, satisfying the requirements of high-demand markets and fostering exports to countries belonging to the European Union without having to pay tariffs. All of this contributes to strengthening the economy and the productive development of Ecuador.

The most important destination markets for Ecuadorian shrimp consist of China with 56% of exports, followed by the United States (18%), the European Union (17%), the rest of Asia (6%), America (2%), and Africa (1%) (Cámara Nacional de Acuacultura, 2023). The province of El Oro represents 35% of the country's production, with an extension of more than 35,000 productive hectares (Alvarado, 2020).

### **1.1.6 Comparative advantages of Ecuadorian shrimp in the international market**

It should be noted that there are not enough studies for Ecuador regarding comparative advantages; however, according to Gonzabay et al. (2021), Ecuador possesses comparative advantages related to the country's climatic benefits. These allow for shrimp production throughout the year with three to four harvest cycles and a high survival rate of 65% per seeded hectare, doubling production batches compared to Asian countries. These comparative advantages, accompanied by careful post-harvest and packaging techniques, have succeeded in producing shrimp with extraordinary flavor, color, and texture, making it the most prominent shrimp worldwide. This shrimp is presented in various forms, such as block frozen (IQF), whole shrimp (semi-IQF), peeled and deveined shrimp tails, cooked ready-to-peel shrimp, breaded shrimp, skewers, and ready-to-consume shrimp rings.

For Durán and Townsend (2017), Ecuador possesses both competitive and comparative advantages, such as climatic and geographical factors, physical infrastructure, investment in equipment, machinery, and technological resources. Additionally, there is the knowledge resulting from being one of the first countries to produce shrimp in captivity, along with

dynamic capabilities and the qualified human talent possessed by both producers and exporting companies. These have become crucial elements for competing regionally and globally, allowing the country to face competitors like Vietnam which, despite having logistical advantages over Ecuador, is fully compensated for by offering a fresh, high quality and affordable product that meets the demanding standards of the European Union, the United States, and Asia.

### **1.1.7 Indicators for Measuring Competitiveness in Product Exports**

A variety of indicators are used to measure the competitiveness of exportable products; in the present study, the following were utilized: Revealed Comparative Advantage (RCA), known as the Balassa Index; Relative Export Advantage (RXA); and the Competitiveness Map.

The Revealed Comparative Advantage, as noted by Pérez et al. (2022), emphasizes the flow of goods of a specific product from a country at a global level, comparing it with other countries that also excel in the commercialization of the same product to determine the level of competitiveness. According to Valenzuela et al. (2025), this indicator was developed by Balassa in 1965 to measure the performance of a specific country's product and its proportion within the destination market.

The Relative Export Advantage (RXA), according to De Gracia (2023), reflects a nation's advantages regarding its exports, providing data that reveal the level of specialization of the export sector under analysis. For Ramírez et al. (2020), this indicator is essential for understanding a country's competitive position in the international market, offering information that serves to develop more effective economic policies tailored to the specific strengths and weaknesses of the analyzed sector.

The Competitiveness Map, according to Saavedra et al. (2019), is used to conduct a corporate diagnosis, the results of which allow for an understanding of organizational performance by comparing it with other companies to establish competitiveness levels. This is based on eight factors: strategic planning, production, quality, marketing, finance, human talent, environmental management, and information systems.

### **1.1.8 Barriers and Opportunities for Exporting**

According to Eras et al. (2023), the Ecuadorian shrimp sector faces multiple tariff and non tariff barriers that hinder its access to international markets. Tariff barriers consist of taxes applied to the import of Ecuadorian shrimp in different countries, which increases the product's cost and affects the competitiveness of exporters. Many countries impose high quotas and tariffs on Ecuadorian shrimp, limiting access to these markets.

On the other hand, non tariff barriers are obstacles not directly related to taxes but which complicate the export of Ecuadorian shrimp. These barriers may include sanitary and phytosanitary (SPS) regulations, certification restrictions, and quality standards that must be met to export to certain countries. Furthermore, technical barriers such as specific labeling requirements or packaging standards may also exist.

To overcome these barriers, the Ecuadorian shrimp sector must comply with the quality requirements and regulations established by importing countries, as well as implement certification and traceability processes that demonstrate product safety and quality. Additionally, it is fundamental to seek new markets and diversify exports to reduce dependence on a single buyer country.

Another opportunity for the Ecuadorian shrimp sector is the Aquaculture Stewardship Council (ASC) certification required to enter the European market (Cámara Marítima del Ecuador, 2022). This ensures that Ecuadorian shrimp meet the phytosanitary and food safety standards demanded in Europe. As pointed out by Rojas (2017), Ecuadorian crustaceans must comply with phytosanitary regulations to maintain high product quality and thus enable greater export volumes.

Regarding export opportunities, these are related to the trade agreements Ecuador has with various countries, including China, the European Union, and the United States the primary destinations for Ecuadorian shrimp.

Ecuador signed a Trade Agreement in late 2017 with the European Union, becoming a trade partner and allowing its products to enter free of duty. According to Gonzabay et al. (2021), shrimp stands out in this regard, provided it meets the quality and food safety requirements demanded by this trade bloc.

In the case of China, according to projections by the Ministry of Production, Foreign Trade, Investment and Fisheries it is anticipated that in the first year of the trade agreement with China, Ecuadorian exports will increase by 22.8%, while imports will grow by 39.1%.

It is estimated that by the year 2030, Ecuador's exports and imports will grow by an average of 8.4% and 7.8%, respectively. This situation represents a significant opportunity for Ecuador under the current Free Trade Agreement (FTA) with China (Banco Central del Ecuador, 2024). As noted by Ochoa and Mina (2023), in China, for example, Ecuador competes with Thailand, Vietnam, and India. Given this level of competition, the Asian country applies strict inspection and quality control standards for aquaculture products.

## **1.2 State of the Art**

Chiriboga and Ureta (2021), in their work on the competitiveness analysis of the *San Plácido* cocoa association in *Portoviejo*, Ecuador, aimed to analyze the institution's competitiveness. The research was qualitative in nature, utilizing a synthetic-analytical method, employing observation techniques and documentary analysis, complemented by interviews with its executives. The results of the investigation demonstrated that the association fails to efficiently meet competitiveness standards, exhibiting shortcomings in its organizational and commercial strategies that prevent it from matching the competition of similar associations.

In the research concerning competitive strategies for the internationalization of banana snacks to the Korean market developed by Morán et al. (2024), the objective was to formulate

competitive strategies to increase the internationalization of banana snacks to the South Korean market; the methodology applied was analytic-synthetic and inductive-deductive. The results indicate that this type of product has not consolidated due to a limitation in strategies that facilitate distribution in the international market, requiring the strengthening of competitive advantages to secure a foothold in the global market.

According to Campi et al. (2017), the objective is to demonstrate business competitiveness in Latin America, specifically the Ecuador case, through models and approaches from different authors. The methodology utilized was bibliographic and documental; the results show that competitiveness in Ecuador is underpinned by the role of the State in developing policies and guidelines that have contributed to strengthening competitive activities in both public and private organizations belonging to multiple economic sectors.

The work by Balarezo (2022) on the theme of small business competitive factors perceived by administration students at the *Universidad Central del Ecuador* aimed to gauge the perception of business administration students regarding the competitive factors of SMEs and to understand their viewpoint on support programs for the sector. The study utilized exploratory descriptive research, surveying students. The results suggested that competitive advantages stem from technology in production processes and administrative tools, making it imperative that the State and trade associations support with lines of financing, access to technology, and new markets to stand out and meet market demands.

In the case of studies utilizing Revealed Comparative Advantage or the Balassa Index, the relative advantage of exports, and competitiveness maps, the following works stand out. The research conducted by Gómez and Jaime (2020) “aimed” to conduct an analysis on the evolution of international trade in Mexico according to the technological intensity of exports, as an indicator of their quality, competitiveness, and economic growth. The methodology was quantitative and included document analysis, utilizing indicators such as the relative trade balance and the Balassa Index or Revealed Comparative Advantage. The work concluded that there are three Mexican sectors possessing revealed comparative advantages with the United States market, such as the automotive sector, technology factories, and medium-technology factories.

Pérez et al. (2022) conducted a study with the objective of analyzing the comparative advantage of 56 countries in the production of biodiesel and bioethanol from 1999 to 2018. As a methodology, they used The Revealed Comparative Advantage index and the Normalized Revealed Comparative Advantage (NRCA) index. The results concluded that Spain, Argentina, Brazil, Indonesia, and the European Union possess a comparative advantage in biodiesel production.

De Gracia (2023) states that the objective of the study is to identify the advantages in palm oil exports to Costa Rica and determine its level of competitiveness. Quantitative, exploratory, and descriptive research was applied. It was concluded that Panama has positive indices regarding the Relative Export Advantage, originating from a specialized and competitive palm oil industry in the Costa Rican market.

Research by Ramírez et al. (2020) aimed to analyze the competitiveness of Mexican strawberries in the foreign market. To achieve this, they used quantitative research methodology through the application of export indices, Relative Export Advantage, and Revealed Comparative Advantage. The results showed that Mexico's strawberry export sector possesses relative advantage and revealed comparative advantage, demonstrating the specialization of this industry, rendering it competitive in the external market.

The research conducted by Saavedra et al. (2019) aimed to determine the relationship between information systems and the competitiveness of SMEs in *México City*. The study was descriptive and correlational, utilizing the competitiveness map developed by the Inter-American Development Bank (IDB). The findings show that SMEs utilizing information systems tend to be more competitive.

## **CHAPTER 2**

### **2. BACKGROUND AND CURRENT STATUS OF THE SECTOR**

#### **2.1 Background of International Trade in Ecuador**

##### **2.1.1 History of International Trade in Ecuador**

Since its separation from *Gran Colombia*, Ecuador has been characterized by its participation in international trade. In its first decades, the country exported cocoa to Great Britain and imported machinery for the agricultural and manufacturing sectors, mainly in the coastal region (Acosta, 2006).

During the first half of the 20th century, Ecuador relied on a primary-export model with production centered in the coastal region, where products such as bananas, coffee, and cocoa were the main protagonists (Creamer, 2021).

The introduction of petroleum as an export in the 1970s marked a significant shift. Between 1970 and 1975, oil exports exceeded the growth of the Gross Domestic Product (GDP), becoming a major pillar of the Ecuadorian economy (Naranjo, 2020). During the period from 1975 to 1995, foreign trade remained dominated by oil exports and traditional products such as bananas, cocoa, and shrimp, along with non-traditional products such as tuna, timber, textiles, and metallic minerals (Pinto, 1996).

##### **2.1.2 Recent Evolution of International Trade in Ecuador**

In the period from 1995 to 2015, dollarization and a favorable international environment for exports allowed for significant economic growth in Ecuador. However, the marked dependence on international oil prices generated vulnerability in the economy, according to Calderón et al. (2016).

Currently, oil is fundamental in foreign trade, representing around 35% of total exports; however, non-oil exports represent 65% of the total (Banco Central del Ecuador, 2023). This implies that, undoubtedly, oil is one of the country's main export commodities.

Ecuadorian exports have experienced sustained growth since 2015, rising from US\$ 18,330.6 million to US\$ 32,658.3 million in 2022. The country experienced a decline in exports in 2016, due to the drop in oil prices, and in 2020, due to the COVID-19 pandemic, which caused a contraction in the local and global economy as we would see in table 1 and figure 1.

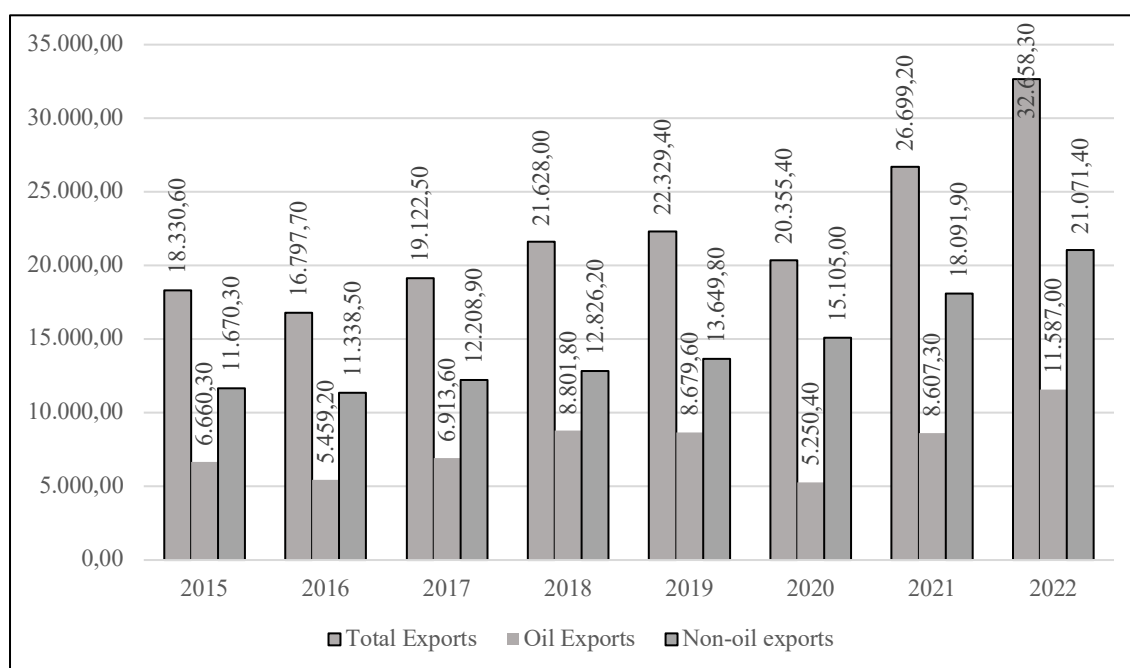
**Table 1. Exports expressed in millions of dollars FOB**

<b>Year</b>	<b>Total exports</b>	<b>Oil exports</b>	<b>Non-oil exports</b>	<b>% share of oil exports</b>	<b>% share of non-oil exports</b>
2015	18,330,6	6,660,3	11,670,3	36.33%	63.67%
2016	16,797,7	5,459,2	11,338,5	32.50%	67.50%
2017	19,122,5	6,913,6	12,208,9	36.15%	63.85%
2018	21,628,0	8,801,8	12,826,2	40.70%	59.30%
2019	22,329,4	8,679,6	13,649,8	38.87%	61.13%
2020	20,355,4	5,250,4	15,105,0	25.79%	74.21%
2021	26,699,2	8,607,3	18,091,9	32.24%	67.76%
2022	32,658,3	11,587,0	21,071,4	35.48%	64.52%

**Source:** Central Bank of Ecuador (2022)

From 2015 to 2022, the share of oil exports averaged 34.76%, while non-oil exports stood at an average of 65.24%. It is observed that oil revenue remains Ecuador's principal export commodity.

**Figure 1. Exports expressed in millions of dollars FOB**



**Source:** Central Bank of Ecuador (2022)

### 2.1.3 Impact of Crisis and Current Challenges

The health emergency caused by the COVID-19 pandemic affected exports of agricultural raw materials, diminishing the labor force and demand in international markets. This had a negative impact on the Ecuadorian economy, which is closely linked to exports (Macías et al., 2020).

Some councils in Latin America propose including trade to achieve the Sustainable Development Goals proposed by the United Nations (World Trade Organization, 2018) as a mechanism to face current challenges. It is important to strengthen the multilateral trading system to support inclusive growth, employment, and poverty reduction. As maintained by Mora et al. (2023), capacity and infrastructure related to trade must also be developed in developing and least developed countries. Furthermore, it is fundamental to diversify exports and add value to products. To avoid trade obstacles, measures must be carried out to ensure that non-tariff barriers do not become impediments to trade. Likewise, e-commerce should be promoted by fostering the participation of micro, small, and medium-sized enterprises (MSMEs) in foreign trade.

As pointed out by Quiñónez et al. (2021), Ecuador must promote exports of non-oil products to a greater extent, whether traditional or non-traditional, to gradually move away from oil dependence through the diversification and expansion of exports. As a result, it is important to have greater bilateral or multilateral relations in search of new markets for Ecuadorian products.

#### **2.1.4 Focus on the Shrimp Industry**

The shrimp industry in Ecuador was consolidated in the 1990s and is currently based on traditional semi-intensive systems that have variable yields (Anaya, 2015). Production has focused mainly on two cultivated species, *P. vannamei* and *P. stylirostris*, with the former representing the majority of production (Cobo, 2019).

This important sector has experienced significant growth in recent decades, becoming one of the country's main economic engines. For Gonzabay et al. (2021), the focus of this industry centers on the production and export of high-quality shrimp, complying with the highest international standards and promoting environmental sustainability.

Ecuador possesses a privileged geographic location that allows for an ideal climate for shrimp farming. Eras and Meleán (2021) indicate that shrimp farms are located mainly in the provinces of Guayas, Manabí, and El Oro, where climatic conditions and bio-aquatic resources provide optimal conditions for the growth of these crustaceans.

Another focus of the Ecuadorian shrimp industry is based on the adoption of good production practices, which guarantee the quality and safety of the shrimp. According to Espinoza et al. (2022), permanent water quality monitoring, a feeding program, and disease prevention are utilized. Furthermore, the responsible use of chemical products and inputs is promoted, with the aim of minimizing their impact on the environment while complying with current legal regulations.

In addition to production, according to Morocho et al. (2020), the focus in the Ecuadorian shrimp industry also centers on the promotion of traceability and product certification. This implies the registration and tracking of each batch of shrimp from its harvest to its commercialization, guaranteeing its origin and quality. Added to this, as noted by Varela et al. (2017), certification from recognized international bodies, such as the Aquaculture Stewardship Council (ASC), the Marine Stewardship Council (MSC), and Hazard Analysis and Critical Control Points (HACCP), provides confidence to consumers and facilitates access to demanding markets globally.

#### **2.1.5 Economic Importance of Shrimp Production**

Ecuador has become one of the main shrimp exporters worldwide, generating significant foreign currency for the country. In the first quarter of 2021, shrimp exports increased significantly, consolidating Ecuador as a major supplier, surpassing other countries (Cámara Nacional de Acuacultura, 2022). Global shrimp production has shown a constant increase, with Ecuador occupying a prominent place as a producer and exporter (Gonzabay et al., 2021).

Table 2 shows the sustained growth of the shrimp sector since 2015, with the exception of 2020 due to the effects of the COVID-19 pandemic. Practically, production in metric tons (MT) tripled, rising from 512 MT in 2015 to 1,069 in 2022, a situation reflected in the US\$ FOB value, which increased from 2,279.8 to 7,289.3 in the same period. Regarding the participation of non-oil products, in 2015 they represented 19.5% of exports, reaching 34.6% in 2022, demonstrating their importance within the Ecuadorian export sector.

**Table 2. Shrimp exports expressed in millions of dollars FOB Source: Taken from Central Bank of Ecuador (2022)**

<b>Year</b>	<b>Metric tons (MT)</b>	<b>Value in USD FOB</b>	<b>Non-oil share</b>
2015	342	2,279.8	19.5%
2016	371	2,580.2	22.8%
2017	442	3,043.0	25.0%
2018	512	3,189.7	24.9%
2019	645	3,890.5	28.5%
2020	688	3,823.5	25.3%
2021	848	5,323.3	29.4%
2022	1,069	7,289.3	34.6%

**Source:** Central Bank of Ecuador (2022)

In conclusion, it can be pointed out that, although oil remains fundamental in foreign trade, the aquaculture sector has experienced sustained growth. Shrimp exports have increased, even surpassing crude oil exports in certain periods (Banco Central del Ecuador, 2023).

## 2.2 The Shrimp Industry and International Trade

The shrimp, scientifically named *Palaemon serratus*, is known for being a crustacean with similar characteristics to the prawn, but smaller in size. Likewise, it shares a common characteristic: the lateral compression of its body, as well as its elongated and upward-curved rostrum. It has the first two pairs of legs ending in small pincers and three pairs of short final legs adapted for locomotion and claws. It possesses a body with transverse bands. Its habitat is characterized by being a demersal species living in seagrass and coastal algae meadows at a depth of 5 to 10 cm, with high resistance to salinity changes; it feeds on detritus and small mollusks or invertebrates. They also have a nocturnal habit, spending most of the day buried or between rocks (Moreiras, 2018).

The shrimp industry is denominated as shrimp farming (*camaronicultura*), which began in the early 1990s. However, currently, shrimp production is obtained in traditional semi-intensive systems ranging between 1,000 and 3,000 kg per hectare, with survival percentages of 50% to 75% (Anaya, 2015).

### 2.3 Description of Shrimp Production in Ecuador and its Economic Importance

It is precise to mention that the yields achieved in ponds depend on the quantity of juvenile larvae entered by stocking and pumping during the shrimp farming period. Consequently, the maximum production obtained in the country in recent years has been 940 pounds of tails in ponds that allow for a good stocking of approximately 25,000 specimens, as well as an appropriate depth of between 90 cm to 1.20 m, maintaining salinity and temperature characteristics according to the period in which the cycle is developing (Cobo, 2019). Such is the case that Cobo (2019) also mentions that in Ecuador, two species are mainly produced under cultivation:

- ***P. vannamei***: This is the most important, not only for its production, which exceeds 95%, but also for the larger size it reaches in the ponds, which requires meeting export characteristics in a period of 7 to 10 months with an average length of 150 mm.
- ***P. stylirostris***: This is less utilized for pond production; however, it is one of the species that is also developed in Ecuador.

Ecuador became the second-largest shrimp supplier to the United States during the first quarter of 2021; approximately 84,205,472 pounds of shrimp were exported, generating around \$208,384,568 in foreign currency for the country, according to data issued by the *Cámara Nacional de Acuacultura*. This resulted in an increase of almost 30% in imported Ecuadorian shrimp for the year 2021, taking the position from Indonesia, which previously held second place in shrimp imports (Cámara Nacional de Acuacultura, 2022). Table 3 shows more detailed information of the main characteristics of the Ecuadorian shrimp.

**Table 3. Technical specifications of shrimp produced in Ecuador**

<b>Characteristics</b>	<b>Description</b>
<b>Specific product</b>	Shrimp larvae and shrimp of the species <i>Litopenaeus vannamei</i> (white shrimp or whiteleg shrimp), for reproduction or industrial farming.
<b>Commercial name</b>	White shrimp, whiteleg shrimp
<b>CPC V.2 Code</b>	04210.01.01
<b>ISIC 4.0 Code</b>	A0321.02
<b>2007 Tariff Code</b>	0306.23.91.00
<b>2012 Tariff Code</b>	0306.27.92.00
	<b>General Properties</b>

<b>Description:</b>	Its coloring is normally translucent white, but it can change depending on the substrate, diet, and water turbidity. The Pacific white shrimp is the main farmed species on the Ecuadorian coast from the <i>Litopenaeus</i> family, of which 95% of production belongs to the species <i>Litopenaeus vannamei</i> , considered one of the most resistant to environmental changes during captive development.
<b>Uses:</b>	It is used for the preparation of various dishes; among the most prominent are seafood rice, shrimp <i>chupe</i> (chowder), ceviches, among others.
<b>Magnitude</b>	Weight
<b>Unit of measurement:</b>	Pounds or kilograms
<b>Commercial presentation:</b>	In boxes
	Specific Properties
<b>Scientific name:</b>	<i>Litopenaeus vannamei</i>
<b>Geographic location:</b>	The white shrimp is native to the eastern coast of the Pacific Ocean, from Sonora, Mexico in the North, through Central and South America to Tumbes in Peru. The ponds occupy around 180,000 hectares, distributed in the Jambelí Archipelago, Guayas River, Estero Salado, Bahía de Caráquez, Cojimies, Muisne, and San Lorenzo.
<b>Commercial size:</b>	Maximum 23 centimeters and minimum 9 centimeters.
<b>Water temperature:</b>	22 to 33° C
<b>Water conditions:</b>	Brackish water, with a pH of 6 to 9.

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**Source:** INEC (2020)

Global shrimp production reached 4 million tons by 2020, with an increase of approximately 5% compared to the previous year. Among the main producers is Ecuador, occupying the second position in the export of this product. In this context, it was determined that national shrimp production was 570,000 tons for 2020, representing an increase of 9.2% in relation to previous years (Gonzabay et al., 2021).

## **2.4 Competitors and Characteristics of the European Market for the Shrimp Sector.**

### **2.4.1 Current State of the Shrimp Market in the European Union.**

Non-oil exports to the European Union, according to the *Banco Central del Ecuador* (2023), reached a FOB value of US\$ 3,811.42 million in the period from January to December 2022. This represents 18.08% of total exports in that period, which totaled US\$ 21,071.40 million.

Ecuador's shrimp sector has experienced sustained growth in the production and export of the crustacean to the external market. According to information from the *Banco Central del Ecuador* (2023), in 2020, a total of 688 metric tons (MT) of this product was produced with a total of US\$ 3,823.5 million, representing 25.3% of non-oil exports, despite being a year characterized by the COVID-19 pandemic.

In 2021, production reached 848 MT with a FOB value of US\$ 5,323.3 million, representing 29.4% of non-oil exports, growing by 39.22%. For the year 2022, shrimp production was 1,069 MT with a FOB value of US\$ 7,289.3 million, accounting for 34.6% of non-oil exports, signifying a growth of 36.93% in relation to the previous year.

In 2022, data from the *National Chamber of Aquaculture* (2023) indicates that Ecuador exported a total of US\$ 996.61 to the EU, representing 18% of the shrimp sector's exports, where Spain, France, and Italy import 38%, 23%, and 20% respectively of the product entering said market, totaling 81% of the European market.

According to Rodríguez et al. (2018), Europeans are distinguished by their preference for organic products due to their high environmental awareness. For the Ministry of Agrarian Development and Irrigation of Peru (2021), this trend has led Germany, together with the United Kingdom and France, to become the main consumption markets for organic products in Europe. This is partly due to the high income of many of their residents.

According to the European Commission (2022), the inhabitants of Europe consume approximately 1.46 kg of shrimp and prawns per capita, an amount lower than that of tuna (3.06 kg), salmon (2.44 kg), and cod (1.72 kg). Ecuador stands out as one of the main shrimp supplier countries, followed by India, Vietnam, Thailand, and Indonesia.

### **2.4.2 Shrimp Exporting Countries**

Based on data obtained from Trade Map (2023) and as mention on table 4, the largest shrimp exporters in 2022 were Ecuador, India, Vietnam, Indonesia, Argentina, Thailand, and China. Since 2021, following the pandemic, Ecuador has become the world's leading shrimp exporter in metric tons, surpassing India and Vietnam, which were previously the largest exporters.

**Table 4. Top shrimp exporting countries in millions of dollars and MT**

Exporters	Value	MT	Value	MT	Value	MT
	USD		USD		USD	
	2020		2021		2022	
Rest of the world	26,972	3.542	35,285	4.107	36,456	4.184
Ecuador	3,823	688	5,323	848	7,289	1.069
India	3,884	536	5,253	687	4,907	645
Viet Nam	2,258	257	2,431	277	2,539	267
Indonesia	1,608	187	1,711	194	1,650	187
Argentina	842	129	1,211	165	903	128
Thailand	775	94	895	99	832	88
China	951	115	999	119	827	88

**Source:** Trade Map (2023)

Table 5 and figure 2 show the primary destination markets for Ecuadorian shrimp, China, the United States, Spain, France, Italy, Vietnam, Thailand and Russia are the main destination countries.

The Chinese market accounts for 53.78% of Ecuadorian exports, followed by the United States with 20.49%, Spain with 5.06%, France with 3.43%, Italy with 2.94%, Vietnam with 1.80%, and Russia with 1.72% (Figure 2).

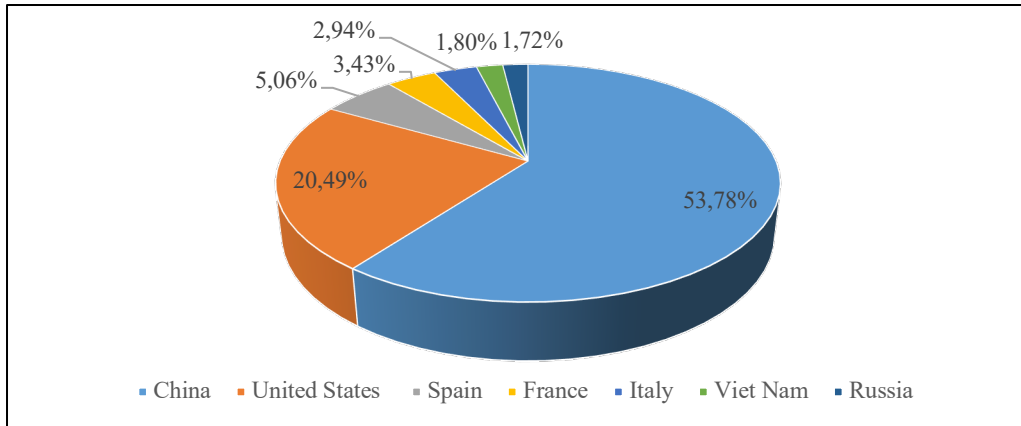
**Table 5. Destination countries for Ecuadorian shrimp in dollars**

Destination Countries	US\$ 2020	US\$ 2021	US\$ 2022
<b>Ecuador</b>	<b>3,823,582</b>	<b>5,323,352</b>	<b>7,289,304</b>
<b>China</b>	<b>1,891,383</b>	<b>2,288,953</b>	<b>4,307,288</b>
<b>United States</b>	<b>764,465</b>	<b>1,332,932</b>	<b>1,641,162</b>
<b>Spain</b>	<b>245,283</b>	<b>338,720</b>	<b>404,957</b>
<b>France</b>	<b>188,382</b>	<b>286,404</b>	<b>274,515</b>
<b>Italy</b>	<b>158,717</b>	<b>187,647</b>	<b>235,136</b>
<b>Viet Nam</b>	<b>31,516</b>	<b>37,127</b>	<b>144,293</b>
<b>Russia</b>	<b>77,885</b>	<b>141,678</b>	<b>137,575</b>
<b>Thailand</b>	<b>20,621</b>	<b>61,235</b>	<b>74,287</b>
<b>United Kingdom</b>	<b>36,111</b>	<b>68,610</b>	<b>71,892</b>
<b>Belgium</b>	<b>46,044</b>	<b>39,939</b>	<b>68,532</b>

<b>Japan</b>	<b>20,583</b>	<b>28,807</b>	<b>66,815</b>
<b>Netherlands</b>	<b>61,789</b>	<b>76,064</b>	<b>65,570</b>

Source: Trade Map (2023)

**Figure 2. Destination countries for Ecuadorian shrimp**



Source: Trade Map (2023)

### 2.4.3 Shrimp Importing Countries

According to information gathered from Trade Map (2023), the largest shrimp importers in 2022 were China, the United States, Japan, the European Union, Korea, and Canada. These countries have a high demand for shrimp due to its popularity in the food industry and culinary culture. China is a key country due to its growing middle class and its demand for seafood.

The United States is the second country leading the list, as it is known as one of the largest seafood importers globally. Japan is also a major importer due to its tradition of consuming fresh seafood. Spain, France, the Netherlands, Korea, and the United Kingdom are also important importers due to their inhabitants' preference for marine products (see Table 6).

**Table 6. Main shrimp importing countries**

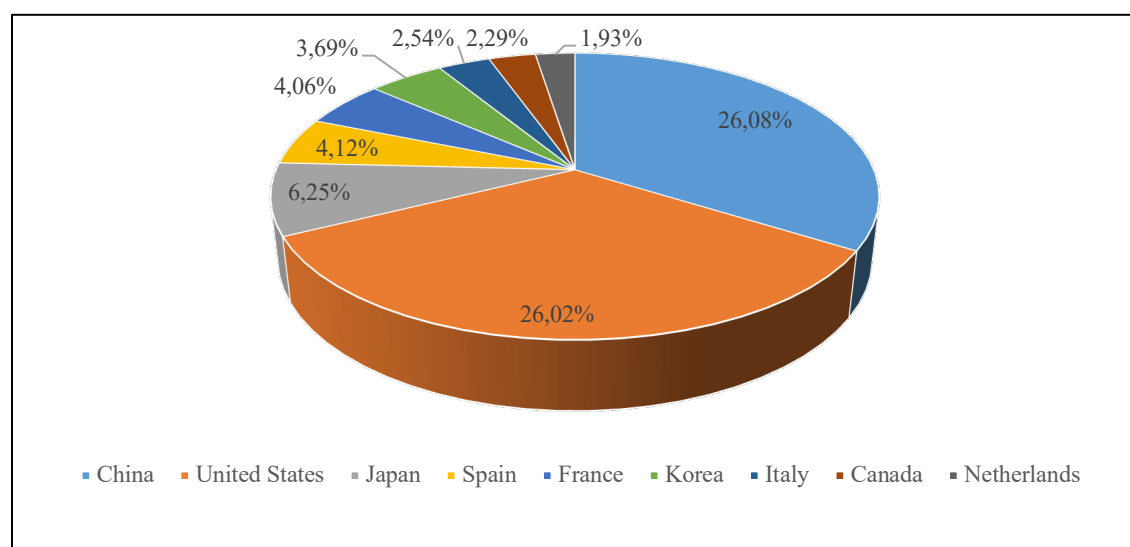
<b>Importers</b>	<b>Value USD 2020</b>	<b>MT</b>	<b>Value USD 2021</b>	<b>MT</b>	<b>Value USD 2022</b>	<b>MT</b>
World	27,159,123	5,277,287	35,003,129	3,384,068	36,676,728	3,701,993
China	5,911,765	738,602	6,974,095	793,869	9,565,762	1,094,029
United States	7,698,269	709,719	10,943,787	860,998	9,541,503	752,495
Japan	1,970,299	174,720	2,269,056	185,287	2,292,084	183,177
Spain	1,212,837	171,432	1,620,448	179,545	1,512,386	184,327
France	1,066,690	126,650	1,457,743	154,157	1,489,762	154,702

Korea	1,137,173	138,241	1.272.870	129.970	1.353.737	132.050
Italy	655,349	82,368	986,308	104,552	932,676	98,081
Canada	645,412	65,339	982,802	77,431	839,744	82,134
Netherlands	514,895	61,409	657,493	74,286	706,859	82,134

Fuente: Trade Map (2023)

Figure 3 shows that China is the principal global shrimp importer with 26.08%, followed by the United States with 26.02%. Japan ranks third with 6.25%, followed by Spain with 4.12%, France with 4.06%, Korea with 3.69%, Italy with 2.54%, Canada with 2.29%, and the Netherlands with 1.93%.

**Figure 3. Main shrimp importing countries**



**Source:** Trade Map (2023)

In the case of China, the primary country supplying it with shrimp is Ecuador, with 564,597 metric tons (MT), followed by India with 140,825 MT, Vietnam with 54,851 MT, and Thailand with 30,171 MT. That is to say, Ecuador is the principal shrimp supplier to China.

#### 2.4.4 Shrimp Import Regulations in the European Union

As noted by Mora et al. (2020), certifications are utilized in the realm of international trade to ensure compliance with regulations established by the general market and specific regulatory bodies. According to the German organization FIZ (2022), to export seafood to Europe, certifications or labels such as the Aquaculture Stewardship Council (ASC) must be taken into account; likewise, the EU organic logo and the Naturland seal represent specifications for the protection of mangroves on coasts, as well as for water and soil protection.

The non-profit organization Aquaculture Stewardship Council (ASC), founded in 2010 by the WWF and the Dutch Sustainable Trade Initiative (IDH), is an independent entity of great global influence. Its main objective is to become the world's leading program in terms of labeling and certification of responsibly produced aquaculture seafood products (Aquaculture Stewardship Council, 2021).

Exporters require traceability systems to track the origin of products; one of the most well-known and utilized in Latin America is HACCP. For Mora et al. (2020), the Hazard Analysis and Critical Control Points system, better known as HACCP, is a preventive food safety management approach that identifies and controls hazards in production.

In addition to the aforementioned, it must be taken into account that exporting companies domiciled in Ecuador require the Shrimp Export Health Certificate (*Certificado Sanitario de Exportación del Camarón*), which is a procedure stating that the product is fit for human consumption, meeting the quality, safety, and harmlessness standards demanded abroad (Agencia Nacional de Regulación, Control y Vigilancia Sanitaria, 2022).

## **CHAPTER 3**

### **3. METHODOLOGY**

#### **3.1 Research Approach**

The research approach selected for this study was quantitative and qualitative. Quantitative research seeks to maximize existing information through statistical data from institutions and organizations linked to the object of study (Hernández, Fernández, & Baptista, 2006).

The quantitative approach was applied to address the specific objectives of substantiating the competitiveness of the shrimp sector in the European Union market. Through quantitative techniques including statistical data analysis, numerical and quantifiable data related to production, supply, and demand of shrimp in the local and European markets was collected. This will allow for establishing a solid foundation to determine the factors contributing to the development of the investigated sector. In the case of the qualitative approach, a set of questions administered to executives of the shrimp export sector in the El Oro province was analyzed.

#### **3.2 Type of Research**

Due to its objectives and the nature of the topic addressed, this research is considered exploratory and descriptive.

According to Esteban Nieto (2018), exploratory research aims to familiarize the researcher with specific phenomena and obtain a more complete understanding of a particular context. It is also employed to address new problems, identify promising concepts or variables, establish priorities for future research, and propose relevant assertions and postulates. The type of

research conducted is exploratory, as it seeks to obtain an initial understanding and a general overview of the landscape and current conditions of the Ecuadorian shrimp market in the European Union. Possible barriers and opportunities for export, as well as the challenges and benefits this entails, were also explored.

Descriptive research aims to collect data and information regarding the characteristics, properties, aspects, or dimensions of the object of study. It is useful for providing a detailed description of a phenomenon, event, community, context, or situation (Esteban, 2018). This type of research applied to the project describes and analyzes the current situation of the Ecuadorian shrimp sector in relation to the competitive levels utilized to export to the European Union market.

Taken together, the application of both types of research will enabled the construction of a comprehensive vision of the shrimp sector's competitiveness, which is fundamental for making informed decisions and strategically planning the export process.

### **3.3 Research Method**

The research method employed for the present work was the analytic-synthetic method. The analytic-synthetic method is divided into two parts. The analytic part implies decomposing a whole into its constituent parts to understand each element separately. On the other hand, the synthetic part implies the composition of the whole by gathering the parts that had been previously decomposed (Romero Urréa, Real Cotto, Ordoñez Sánchez, Gavino Díaz, & Saldarriaga, 2022).

The analytic part was employed to diagnose the current situation of the Ecuadorian shrimp sector, decomposing and analyzing each of the sector's components; through the detailed analysis of each of these elements, a deep understanding of the current situation and the challenges and opportunities facing the sector will be obtained.

To substantiate the competitiveness of the shrimp sector in the European Union, an exhaustive analysis of relevant data was carried out. This included information regarding the demand for Ecuadorian shrimp in this community, market characteristics and preferences, as well as the current supply of similar products in the country. This analysis allowed the identification of competitive advantages and the potential of Ecuadorian shrimp in the European market.

The synthetic part was employed to achieve the general objective of the study, which was to evaluate the competitiveness of the shrimp sector in the European Union. Synthesis implies combining the information collected and analyzed in the previous specific objectives to construct a coherent and complete general overview of the factors influencing the competitiveness of aquaculture activities. Findings and conclusions were integrated to evaluate the set of factors determining competitiveness. By combining these elements, recommendations were obtained for the elaboration of future strategies necessary for informed and grounded decision-making regarding Ecuadorian shrimp exports.

### 3.4 Research Design

The design applied to the research was of a bibliographic and field nature.

**Literature Review:** This implies the collection and review of existing literature on the study topic. The objective is to obtain structured knowledge from concepts gathered in relevant primary literature (Salas Ocampo, 2019). Its distinctive characteristic is the use of secondary data as a source of knowledge. It is responsible for collecting, compiling, and selecting data from readings of documents, journals, books, recordings, films, newspapers, articles, research results, and event proceedings, among other sources. Observation is present during data analysis, as well as its identification, selection, and articulation with the object of study (Reyes & Carmona, 2020). Through bibliographic research, it was possible to obtain a solid theoretical and conceptual foundation because it relies on the exhaustive review of secondary information sources, such as books, academic articles, technical reports, and databases related to the shrimp industry, the shrimp market, export regulations, and other aspects relevant to the study.

**Field Research:** This type of research is carried out in the natural environment of the object of study (Cejas & Prato, 2022). Researchers enter the field not only to collect data but also to understand in depth the reality of the object involved in the study (Salas Ocampo, 2022). It is a field research study, as it requires a direct collection of data and observations at the study site. These data will be obtained directly through data collection instruments applied to key stakeholders in the shrimp industry.

### 3.5 Population and Sample

According to Mucha et al. (2021), a population refers to the complete set of cases sharing specific characteristics, and is delimited by factors such as place, content, and time. In other words, it represents the totality of elements, persons, or things that form part of the object of study in research (Cejas & Prato, 2022).

On the other hand, the sample is a subset selected from the population due to time and resource constraints. Instead of studying all elements of the population, a representative sample is chosen that allows for obtaining valid and generalizable conclusions (Cejas & Prato, 2022).

The population for this study included four executives from the shrimp export sector of the El Oro province, who were asked to answer a set of questions related to the eight variables under study, which served to elaborate the competitiveness map. The executives belong to the shrimp exporters: two from Promaoro S.A, one from Marecuador Cía. Ltda., and one from Oceanproduct Cía. Ltda.

### 3.6 Data Collection Techniques and Instruments

Information collection was carried out through document analysis. As defined by González and Sadier (2019), this is a process through which the most relevant and significant ideas of a document are carefully chosen with the purpose of expressing its content clearly and precisely,

in order to facilitate the retrieval of the information it contains. An exhaustive analysis of documental sources was conducted, such as government reports, previous studies related to the shrimp sector, export statistics, trade treaties, regulations, and international trade policies.

As an instrument of this technique, the literature review is presented, which implies the search and evaluation of current and past research related to a selected topic or thematic area. Its main objective is to show the current state of the investigated topic (Arteaga, 2022). For the document analysis, databases, books, academic journals, and government documents were used to collect updated and relevant information on shrimp trade and commercial regulations between Ecuador and the European Union.

To measure competitiveness, the Revealed Comparative Advantage (RCA) index, known as the Balassa Index, was utilized. For López et al. (2023), this index serves to conduct a comparative study of a specific product that countries possess over time, the results of which generate data to gauge the level of competitiveness in markets. Establishing the RCA ranges requires referring to the indications in Table 7.

**Table 7. Index range for measuring Revealed Comparative Advantage (RCA)**

<b>Comparative advantage</b>	<b>RCA index range</b>
Comparative disadvantage	26.972
Weak comparative advantage	3.823
Moderate comparative advantage	3.884
Strong comparative advantage	2.258

The RCA index is calculated using the formula presented in Equation 1:

$$\frac{\text{total exports by country "i"}}{\text{exportaciones totales realizadas por el país "i"}} \div \frac{\text{world exports of good "k"}}{\text{total world exports}}$$

Another indicator used was the Relative Export Advantage (RXA), also known by its acronym VRE in Spanish (*Ventaja Relativa de Exportaciones*), which allows for determining a country's comparative advantage in the export of a specific product. When the result is greater than one, it signifies that the country possesses a competitive advantage in that product. To calculate the RXA, the share of a country's product in global exports is determined in comparison to global exports. If the result is greater than one, it means a relative advantage exists for the country.

The competitiveness map developed by the Inter-American Development Bank (IDB) was also employed; according to Saavedra et al. (2019), it was adapted by the *Cámara de Comercio de Medellín y Antioquia* with the purpose of diagnosing Colombian SMEs. This tool is divided into eight sections: 1) strategic planning, 2) quality assurance, 3) value chain, 4) merchandising, 5) accounting and finance, 6) human talent, 7) environmental management, and 8) information systems. The questionnaire consists of 102 questions to gauge the organization's competitiveness level, with responses on a Likert scale from 1 to 5, where 1 corresponds to exist, 2 to in the process of documentation, 3 to documented, 4 to documented and disseminated, and 5 to documented, disseminated, and updated.

### **3.7 Data Analysis and Interpretation**

The analysis and interpretation of data obtained from bibliographic and documentary information is of vital importance to obtain precise and relevant information regarding the shrimp industry. Through this process, patterns, trends, and challenges facing both exporters and producers can be identified. Furthermore, insights were gained regarding the advantages related to the competitiveness of the Ecuadorian shrimp sector through the application of the competitiveness map, for which it was necessary to analyze and tabulate the responses of the involved population.

## **CHAPTER 4**

### **4. COMPETITIVENESS OF THE SHRIMP SECTOR**

#### **4.1 Competitive and Comparative Advantages**

Ecuador possesses a series of competitive advantages within the shrimp sector that contribute to its development, becoming one of the main suppliers of this product to the European Union. Following documentary and bibliographic analysis, it has been determined that the competitive advantages are productive activities, genetic improvement of larvae, inputs with organic and environmental certifications, modern packing plants, and quality certifications for export.

Productive activities constitute one of the competitive advantages of the shrimp sector; according to Gonzabay et al. (2021), these are related to larvae hatcheries, transport, production processes, technology, packaging, food supplies, and exporters, which give rise to the increase in aquaculture activities, positioning it as Ecuador's second-largest export product, surpassed only by oil and derivatives, and ranking above bananas.

Another competitive factor relates to the competitive strategies employed by shrimp producers, which are fundamental to ensure the quality of the final product. In this sense, as pointed out by Martínez and Ajila (2022), the pond preparation process plays a crucial role as it guarantees that ponds are free of pathogens, harmful residues, and shrimp competitors. This is achieved through practices such as draining and drying the stocking area, cleaning pipes, and disinfecting

gates, frames, and boards. These actions contribute to maintaining an optimal environment for shrimp development, which translates into a high-quality final product.

Likewise, shrimp quality also depends on the genetics of the larvae used. As mentioned by Eras et al. (2023), it is important to acquire larvae with good genetics and a clinical record certifying good health and absence of diseases that could affect their growth during stocking. Furthermore, it is essential to properly acclimatize the nauplius larvae to guarantee their quality and survival. Maintaining a controlled density of post-larvae during the stocking process is also a determining factor in ensuring shrimp quality.

In addition, the transfer of larvae from nurseries (*pre-criaderos*) to the ponds is a delicate process that must be performed with care and under optimal conditions. It is important to carry out this transfer in the morning hours, when the sun's temperature is not high, to avoid stress on the larvae. As indicated by Eras et al. (2023), once the transfer is completed, it is fundamental to measure shrimp quality through biomass, verifying that they are disease-free and exhibit healthy growth.

Regarding the use of chemical products, Ecuadorian shrimp exporting companies opt to use products with SCI certification and organic acids instead of probiotics. These products guarantee healthy shrimp growth and help maintain a healthy hepatopancreas, which is crucial for the quality of the final product.

Regarding shrimp packing plants, they also provide competitive advantages by offering safe and quality products that have become a priority to meet the demands of consumers concerned about food safety. Vásquez and Torres (2018) consider that these companies have bet on state-of-the-art technology and skilled labor to guarantee that their production processes are efficient and safe. The implementation of control systems and certifications by competent entities is a key strategy to demonstrate these companies' commitment to the quality and safety of their products.

Another competitive factor is linked to certification, which is a seal of guarantee allowing companies to project an image of transparency and commitment to consumers. By opting for nationally and internationally recognized certifications, shrimp packing plants can demonstrate that they meet industry standards and that their products are safe for consumption. Furthermore, these certifications are a way to differentiate themselves in an increasingly competitive market, where consumer trust plays a crucial role in product choice.

Moreover, certifications can also be a tool to access new markets and increase company competitiveness. For Sánchez and Palma (2023), consumers pay attention to the presence of quality seals on the products they buy, especially Europeans; therefore, having recognized certifications can be a determining factor when deciding on a particular product.

These competitive advantages have resulted in constant growth for the aquaculture sector, rising from US\$ 2,279.8 million in 2015 to US\$ 7,289.3 million; that is, in seven years this sector grew by 319%. (See Table 8 and Figure 4).

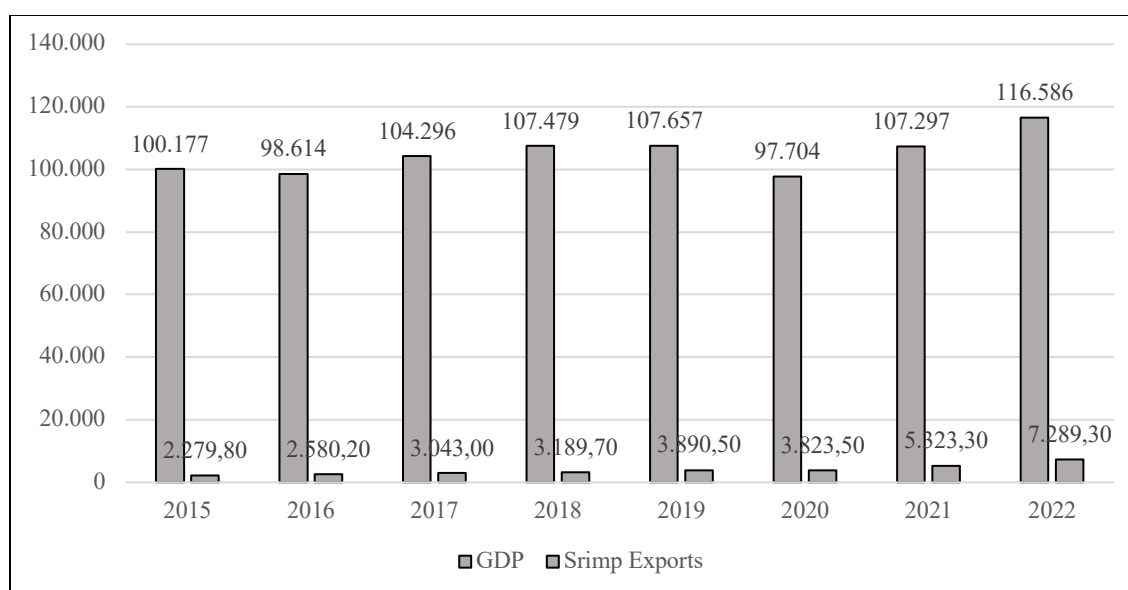
**Table 8. Share of the shrimp sector in the Gross Domestic Product in thousands of dollars.**

Year	GDP	Shrimp exports FOB	inShrimp sector share
2015	100,177	2,279.8	2.28%
2016	98,614	2,580.2	2.62%
2017	104,296	3,043.0	2.92%
2018	107,479	3,189.7	2.97%
2019	107,657	3,890.5	3.61%
2020	97,704	3,823.5	3.91%
2021	107,297	5,323.3	4.96%
2022	116,586	7,289.3	6.25%

**Source:** Central Bank of Ecuador (2022)

Regarding the shrimp sector's share of Ecuador's Gross Domestic Product (GDP), in 2015 it reached a value of 2.28%, and after seven years, this stood at 6.25%, a significant figure that demonstrates the importance of this sector in the country's economic growth. Figure 4 shows more information of Ecuador's GDP and shrimp exports.

**Figure 4. Shrimp sector and Gross Domestic Product (In thousands of USD)**



**Source:** Central Bank of Ecuador (2022)

Another significant competitive factor for the shrimp sector is multilateral agreements; it is precise to consider that, according to the Cámara Nacional de Acuicultura (2023), the European market accounts for 18% of exports with US\$ 1,171 million in 2022. Prominent among these markets are Spain, France, Italy, Russia, Belgium, England, and the Netherlands—countries characterized by demanding quality products with environmentally friendly production practices.

Upon concluding the analysis, it is observed that the Ecuadorian shrimp sector has developed a diversity of advantages that have positioned it as one of the largest exporters of the crustacean worldwide, achieving competitive advantages that demonstrate the high level of business, industrial, and technological development of this important Ecuadorian export sector. This implies that the Ecuadorian shrimp producer has been preparing, training, and innovating to become more productive and competitive in the external market.

## 4.2 Competitiveness Analysis of the Shrimp Sector in the European Union

### 4.2.1 Revealed Comparative Advantage (RCA)

Table 9 presents the top 5 shrimp exporters worldwide, ranked by order of importance: Ecuador, India, Vietnam, Indonesia, and Argentina. The table displays the total exported worldwide.

**Table 9. Top shrimp exporting countries in millions of dollars and MT**

Exporters	Value	MT	Value	MT	Value	MT
	USD		USD		USD	
	2020		2021		2022	
World	26,972	3,542	35,285	4,107	36,456	4,184
Ecuador	3,823	688	5,323	848	7,289	1,069
India	3,884	536	5,253	687	4,907	645
Viet Nam	2,258	257	2,431	277	2,539	267
Indonesia	1,608	187	1,711	194	1,650	187
Argentina	842	129	1,211	165	903	128

**Source:** Trade Map (2023)

The European Union is one of the main destinations for shrimp; in Table 10, we observe that for the year 2020 it reached US\$ 5,652 million; in 2021 the market consumed US\$ 7,070 million in crustaceans, while for 2022 the value stood at US\$ 8,048 million, demonstrating the importance of the market. (Table 10)

### Table 10. Shrimp imports in the European Union

<b>Imports</b>	<b>Value USD 2020</b>	<b>Value USD 2021</b>	<b>Value USD 2022</b>
European Union	5,652,965,700	7,070,024,556	8,048,735,807

**Source:** Trade Map (2023)

The RCA indices of the five analyzed countries allow establishing that Ecuador is a highly competitive country because it obtains a value greater than 4, which signifies a strong competitive advantage. Table 11 shows that in the year 2020, shrimp accounted for 0.10% of trade in the European Union, while Ecuador's total exports stood at US\$ 20,355 million, and shrimp exports were US\$ 3,823 million, representing 18.78% of Ecuadorian exports. According to the Balassa index formula,  $18.78\% / 0.10\%$  yields a result of 180.1; for the year 2021, the indicator stands at 183.9, and in 2022 at 230.6. This makes it the country with the greatest competitive advantage in shrimp exports to the European Union. (Table 11)

**Table 11. RCA results of the main shrimp exporters to the European Union**

<b>Year</b>	<b>Ecuador</b>	<b>India</b>	<b>Vietnam</b>	<b>Indonesia</b>	<b>Argentina</b>
2020	180,524998	0,002933	0,000002	0,000002	0,003320
2021	183,902872	0,000003	0,000002	0,000002	0,003405
2022	230,601801	0,000002	0,000001	0,000001	0,002163

The difference in competitiveness levels in shrimp exports by Ecuador is significant compared to the other four countries; none of them achieves a value greater than one, which means they have a comparative disadvantage in the export of this commodity.

#### **4.2.2 Relative Export Advantage (RXA)**

Table 12 displays the indicators of the Relative Export Advantage (RXA), where Ecuador stands out above the other analyzed countries.

**Table 12. Indicators of countries with the highest relative export advantage in millions of dollars and percentage share for the year 2022**

<b>Exporters</b>	<b>Shrimp exports</b>	<b>%</b>	<b>European Union exports</b>	<b>%</b>	<b>RXA</b>
<b>Total</b>	<b>36,456</b>		<b>8,048,735.80</b>		
			<b>7</b>		
<b>Ecuador</b>	<b>7,289</b>	<b>19.99%</b>	<b>4,484,937</b>	<b>0.0557%</b>	<b>358.81</b>
<b>India</b>	<b>4,907</b>	<b>13.46%</b>	<b>84,693,350</b>	<b>1.0523%</b>	<b>12.79</b>
<b>Vietnam</b>	<b>2,539</b>	<b>6.96%</b>	<b>52,764,229</b>	<b>0.6556%</b>	<b>10.62</b>
<b>Indonesia</b>	<b>1,650</b>	<b>4.53%</b>	<b>23,196,432</b>	<b>0.2882%</b>	<b>15.70</b>
<b>Argentina</b>	<b>903</b>	<b>2.48%</b>	<b>11,513,959</b>	<b>0.1431%</b>	<b>17.31</b>

**Source: Trade Map (2023)**

Table 12 shows that the five analyzed countries—Ecuador, India, Vietnam, Indonesia, and Argentina—have values greater than 1, which means they possess a relative advantage in exports. However, within this group, Ecuador stands out with an indicator of 358.81, compared to Argentina with 17.31, Indonesia with 15.70, India with 12.79, and Vietnam with 10.62. This confirms the shrimp sector's high level of competitiveness in the European Union market.

### **4.2.3 Competitiveness Map**

To conduct the competitiveness analysis, the competitiveness map created by the Inter-American Development Bank (IDB), adapted for companies, was employed. According to Saavedra et al. (2019), this map analyzes 8 areas for which a questionnaire was applied, the results of which are shown in Table 13.

**Table 13. Competitiveness map**

<b>Competitiveness areas or variables</b>	<b>Initial score</b>	<b>Questions</b>	<b>Weighting</b>	<b>Weighted score</b>
Strategic planning	4.55	10	0.1	0.46
Value chain	4.07	26	0.1	0.41
Quality assurance	4.54	7	0.1	0.45
Merchandising	4.42	16	0.05	0.22
Accounting and finance	4.66	11	0.15	0.70
Human resources	4.36	14	0.2	0.87
Environmental management	4.36	9	0.2	0.87
Information system	4.69	9	0.1	0.47
<b>Total</b>	<b>35.65</b>	<b>102</b>	<b>1.00</b>	<b>4.45</b>

The result was 4.45 out of 5, which is an excellent rating that indicates a high level of competitiveness, making it one of the most important sectors of the Ecuadorian economy, while simultaneously converting the country into one of the largest shrimp producers in the foreign market.

The area with the best score is Human Talent and Environmental Management with 0.87 points; these are important areas for meeting organizational objectives in the case of personnel, and international requirements for environmental management, taking into account the demands of the European Union market.

Another area with an excellent score is Accounting and Finance with 0.70; for this, it is important for exporting companies to know operational costs, comply with tax obligations, and maintain updated financial information for correct decision-making. Information Systems, with 0.47, contributes to maintaining updated computer applications to provide data for optimizing controls in the departments that make up the exporting companies.

Strategic Planning obtained 0.46, representing information managed by the company to know if organizational objectives and goals are met, and to understand the competition, market needs, and departmental resources. In the case of Quality Assurance, the score was 0.45, indicating that shrimp exporting companies maintain efficiency in their commercial and productive

activities to meet the demands of the international market, where regulations must be fully complied with for product entry.

The Value Chain has a score of 0.41, stemming from the fact that companies try to possess modern machinery and equipment, have efficient logistics, comply with sales forecasts, and have contingency plans to face any situation outside the norm. Finally, Merchandising, with 0.22, is related to knowing external market needs, having a marketing plan, and establishing the market segment, competition, demand, and prices, to be attentive to changes that may occur in the international market.

These scores show that the Ecuadorian shrimp sector is competitive, having become one of the world's largest crustacean exporters. However, the shrimp export sector of the El Oro province possesses small deficiencies that must be addressed to increase its competitiveness levels and convert it into one of the most prestigious in its sector.

In the case of Strategic Planning, an update of the plan is necessary, as well as sharing it with every executive and supervisor in the companies so that department heads become involved in planning. Added to this, it is pertinent to perform comparisons of strategies with similar companies.

The Value Chain must have a documented, disseminated, and updated program for the acquisition of machinery and technology for the future; contingency plans must also be updated for their dissemination and application. Innovation has not been updated for implementation in company processes, and programs for equipment and technology acquisition must be updated.

Quality Assurance must update programs for training in quality topics and continuous improvement, as well as the identification of client needs regarding improvements or redesigns.

Merchandising requires updating the establishment of objectives for personnel in charge of commercializing the product; information on the competition regarding reputation, product quality, and prices must also be improved. Information referring to new products that have generated a significant percentage of sales must be updated. It is precise to update the system to establish the level of customer satisfaction.

Accounting and Finance needs to improve accounts receivable reports during the first 10 days. It is precise to maintain updates on financial results and their comparison with budgets for correct decision-making.

Human Resources requires updating policies and procedure manuals for personnel; it is also important to document and update oral and written communication between the different levels of the organization. It is important to improve organizational culture to increase the employees' sense of belonging.

Environmental Management must keep environmental regulations and worker welfare updated, in addition to being up-to-date on compliance with environmental standards, to possess environmentally friendly processes—one of the requirements demanded by the European Union market.

Finally, Information Systems must be updated regarding new developments in software and computer equipment, counting on trained personnel for their efficient handling. Added to this is the updating of information systems to comply with process times and security.

## **CONCLUSIONS**

The Ecuadorian shrimp sector, one of the main exporters worldwide, has experienced significant growth in recent decades, thanks to the growing demand for shrimp internationally. However, this growth has brought with it a series of challenges to increase competitiveness levels, which have positioned the Ecuadorian product among the most commercialized worldwide, in which private investment has stood out as the main mainstay for the development of such an important export sector.

The analysis of competitors and the characteristics of the European market in the shrimp sector is fundamental to understand Ecuador's position in this sector and identify possible opportunities for growth and development. In this case, India, Vietnam, and Indonesia have been identified as the country's main competitors in the European market; they are characterized by their wide supply of high-quality shrimp and competitive prices, as well as infrastructure and advanced technology in aquaculture production. However, Ecuador has taken the lead in its productivity levels, positioning it as the main shrimp exporting country in the world, where product characteristics and quality certifications endorsing environmentally friendly practices have positioned the country in the global market.

The shrimp sector is one of the most competitive worldwide. The identified competitive factors, such as productive activities, genetic improvement of larvae, inputs with organic and environmental certifications, modern packing plants, and quality certifications for export, are fundamental for the quality and success of the shrimp industry in Ecuador. Genetic improvement of larvae and the use of certified inputs contribute to final product quality, which is a determining factor in the international market. Likewise, the presence of modern packing plants and quality certifications facilitates the exportation and guarantees customer satisfaction. Furthermore, the comparative advantages of the Ecuadorian shrimp sector, such as geographic location and climatic benefits, play a fundamental role in the industry's competitiveness. The country's strategic location, together with a favorable climate, favors the survival of larvae and contributes to higher productivity. This translates into a significant competitive advantage compared to other shrimp-producing countries.

The Revealed Comparative Advantage (RCA) establishes that Ecuador is the country with the highest competitiveness in the exportable shrimp sector, with a result of 180, which signifies a strong competitive advantage. Regarding the Relative Export Advantage (RXA), Ecuador again stands out above its immediate competitors with a result of 358. The competitiveness map indicates a high competitive level of the shrimp export sector with a score of 4.45 out of 5, which has allowed it to become one of Ecuador's main economic sectors, contributing to social, economic, business, and industrial development and growth.

## **RECOMMENDATIONS**

The Ecuadorian shrimp sector has demonstrated notable growth in recent decades, becoming one of the main exporters worldwide. This success entails a series of challenges that must be addressed to maintain and increase levels of competitiveness in the market. One of the key strategies to face these challenges and continue strengthening the Ecuadorian shrimp sector is private investment. Private investment has proven to be fundamental for the development and growth of the shrimp industry, allowing for the modernization of facilities, the implementation of advanced technology, the improvement of farming practices, and the guarantee of product quality. For this reason, it is recommended that companies in the Ecuadorian shrimp sector continue betting on private investment as the main pillar for their development. It is necessary to continue investing in personnel training, in the research and development of new sustainable farming techniques, in the implementation of environmentally friendly production practices, and in the improvement of infrastructure to guarantee long-term competitiveness. Furthermore,

it is important to promote strategic alliances with research institutions, universities, and international organizations to foster innovation and sustainability in the shrimp sector. These alliances can facilitate access to resources and specialized knowledge that help improve productivity and the quality of the final product.

The competitive levels of the shrimp sector worldwide are high; therefore, Ecuador must remain competitive in the European market, focusing on the quality of its products, the sustainability of its production practices, and innovation in its processes. Moreover, it is crucial that the country strengthen its commercial alliances and marketing strategies to differentiate itself from the competition and highlight its competitive advantages. The European market offers great opportunities for the shrimp sector, as European consumers increasingly value the quality and sustainability of the products they consume. Ecuador, with its renowned shrimp industry and its commitment to sustainability, has the potential to stand out in this market and capture the attention of European consumers.

The shrimp industry in Ecuador has managed to position itself as a world leader thanks to the identified competitive factors that are fundamental for its quality and success. Productive activities, genetic improvement of larvae, inputs with organic and environmental certifications, modern packing plants, and quality certifications for export are key elements that have allowed this sector to stand out in the international market. The genetic improvement of larvae, for example, has allowed for increasing the productivity and quality of Ecuadorian shrimp, making it a product highly valued by consumers. Furthermore, the use of inputs with organic and environmental certifications guarantees that the production process is sustainable and respectful of the environment, an aspect increasingly valued by consumers and international regulators. Likewise, modern packing plants and quality certifications for export ensure that the final product meets the most demanding standards of quality and food safety, which has contributed to the excellent reputation of Ecuadorian shrimp in international markets. On the other hand, the comparative advantages of the Ecuadorian shrimp sector, such as its geographical location and climatic benefits, also play a fundamental role in its competitiveness. These factors allow for reducing production costs and facilitate distribution logistics, which translates into greater efficiency and competitiveness in the global market, a situation that must be taken advantage of by the Ecuadorian shrimp sector to remain at the peak of production and quality of this product.

Despite the high rating obtained through the Revealed Comparative Advantage (RCA), Relative Export Advantage (RXA), and the competitiveness map, the shrimp export sector must make certain adjustments related to strategic planning activities, value chain, quality assurance, merchandising, accounting, human talent, environmental management, and information systems, a situation that allows them to increase the competitive advantages that have allowed them to be at the pinnacle of shrimp production and commercialization worldwide.

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## APPENDICES

### APPENDIX A. Competitiveness Measurement Questionnaire

#### QUESTIONNAIRE TO MEASURE COMPETITIVENESS

It is necessary to conduct a questionnaire specifically directed to each of the areas and sub-areas of the company, rating the level at which the company is located from zero to five; this rating is based on the following:

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

#### QUESTION BANK

##### 1. STRATEGIC PLANNING

###### Process:

1. The company has carried out a strategic planning process in the last two years.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

2. The company has a basic business strategy written and known by everyone who must execute it.

1	Exists	
2	In the process of being documented	
3	Documented	

4	Documented and disseminated	
5	Documented, disseminated, and updated	

3. Spaces are being provided for everyone to get involved with strategic planning.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

4. Strategic planning is the result of teamwork, and those responsible for its execution and compliance participate in its preparation.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

5. Specific, quantifiable, and measurable objectives are defined, along with a defined timeframe for their execution, by the people responsible for the involved area.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

6. When planning, a SWOT analysis is developed for the company and the sector in which it operates, with the appropriate participation of the areas.

1	Exists	
---	--------	--

2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

7. The sector where the company operates is frequently analyzed, considering factors such as: new suppliers, new customers, new competitors, new competing products, new technologies, and new regulations.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

8. When formulating competitive strategies, the technique of comparing the company with best practices is used.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

## **Implementation**

9. Personnel are actively involved in achieving the company's objectives, as well as in the changes demanded by the implementation of the strategy. 10. Strategic planning provides the guidelines for the general allocation of resources in each area of the company's business, with effective monitoring.

## **2. VALUE CHAIN**

### **Planning**

11. The company's production process is adequate for manufacturing products with quality and competitive costs.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

12. The company has a written and detailed program for the acquisition of machinery and technology to be executed in the foreseeable future.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

13. The production process is sufficiently flexible to allow changes in the products to be manufactured based on satisfying customer needs.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

14. Production planning is based on sales forecasts; the company has control measures for the production flow to know the status and progress of production orders.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

15. The company's machinery and technology allow it to manufacture competitive products at a national level in terms of quality and price.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Capacity

16. The company knows the production capacity of its machinery and equipment for each production line and its human resources, and defines the desired range of utilization.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

17. The company has contingency plans to expand its production capacity beyond its current potential to respond to demand that exceeds its production capacity.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Maintenance

18. A preventive maintenance program is carried out for all equipment and machinery, and the results are properly documented.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

19. The company maintains an inventory of key parts and spares for critical equipment; equipment operators participate in their maintenance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

20. The company establishes its maintenance program under the concept of predictive maintenance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

21. The company establishes its maintenance program under the concept of productive maintenance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

22. The company has insurance against fire and other devastating calamities, as well as adequate business interruption insurance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Research and Development

23. Innovation is incorporated into the different processes of the company and is considered of vital importance for its survival.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

24. There is a formal research process for new raw materials and production processes.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

25. The company has a research and monitoring program for key technologies for its business.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

26. The company has a written and detailed program for equipment and technology acquisition and the modernization of its production process.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

**Procurement**

27. There are formal criteria for planning the purchase of raw materials, supplies, and spare parts.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

28. There is a flexible and efficient supply system that meets the needs of the plant.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

29. The company has a contingency plan for critical raw materials, critical technologies, and critical personnel to guarantee the normal fulfillment of its commercial commitments.

1	Exists	
2	In the process of being documented	
3	Documented	

4	Documented and disseminated	
5	Documented, disseminated, and updated	

30. In general, the criteria used to select suppliers of raw materials and supplies are, in order:  
1. Quality, 2. Service, 3. Price, 4. Payment terms.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Inventory Management**

31. As a result of negotiations with suppliers, deliveries of raw materials have been scheduled to maintain inventory at an optimal level according to needs.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

32. There is an optimal level of inventory for raw materials, work in progress, and finished products to reduce losses caused by poor management.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

33. The storage and inventory management system guarantees adequate levels of rotation, use, and control.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

34. On a scheduled basis, physical inventory of raw materials, supplies, and finished products is compared with the inventory kept in the records (kardex).

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

**Infrastructure Location**

35. The location of the plant is ideal for the supply of raw materials, labor, and for the distribution of the finished product.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

36. The plant's infrastructure and facilities are adequate to meet its current and future needs.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

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### 3. QUALITY ASSURANCE

#### General Aspects

37. General management has the philosophy of promoting quality programs in the company and adequately trains its employees in quality aspects and continuous improvement.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

38. Quality standards for all the company's products are duly documented and known by the people responsible for their compliance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

#### System

39. The company's products comply with the technical standards established for the sector.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

40. The quality system identifies customer needs and compares them with the product offered by the company to propose improvements or redesigns.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

41. The quality system involves the necessary controls to identify and measure defects and their causes in production processes, provides feedback to implement corrective actions, and monitors them.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

42. In the raw material selection process, technical specifications exist, and the necessary controls are applied to verify quality and provide feedback to the selection and purchasing process.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

43. The results of tests and inspections are clearly documented throughout the process, from the reception of raw materials until the products are ready for delivery.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	

5	Documented, disseminated, and updated	
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#### 4. MERCHANDISING

##### Marketing and Sales

44. The planning process generates an annual marketing plan, strict and detailed, with clearly defined responsibilities and management indices.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

45. The company has clearly defined its target market, penetration, positioning, and marketing strategies.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

46. The company knows the market segments in which it competes, its share, growth, and profitability, and develops commercial strategies for each of them.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

47. The company sets goals or quotas for sales, collections, and new customer acquisition for each of its salespeople and monitors their compliance.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

48. The company has information on its competitors (regarding reputation, quality of products and services, sales force, and prices).

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

49. The company's strategies, objectives, and prices are determined based on knowledge of its costs, supply, demand, and the competitive situation.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

50. New products (less than three years old) have generated a significant percentage of total sales and profits for the company.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

51. Resources assigned to marketing (advertising material, commissions, etc.) are adequate and used efficiently.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

52. The company has an information and analysis system that allows it to obtain updated information on its customers, their needs, and the factors that guide their purchasing decisions.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

53. The company periodically evaluates its promotion mechanisms, market information systems, and trend monitoring.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Services

54. Personnel who have contact with the customer are aware of their responsibilities and have sufficient autonomy to adequately address their needs.

1	Exists	
2	In the process of being documented	

3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

55. The company has a research system that allows it to know the level of customer satisfaction, documents it, and takes actions based on its analysis.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

56. The company provides catalogs and technical specifications for its products.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

**Distribution**

57. The company has a trained, motivated, and competent sales force that supports the fulfillment of the company's objectives.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

58. The company has developed an efficient distribution system that allows its products to be delivered to its customers when and where they need them.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

59. The company prefers to hire salespeople with a formal employment link rather than independent contractors without one.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

## 5. ACCOUNTING AND FINANCE

### Cost Monitoring and Accounting

60. The accounting and cost system provides reliable, sufficient, timely, and accurate information for decision-making.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

61. General management receives accounting results reports within the first ten days of the following month; accounts receivable reports organized by aging periods are prepared periodically (bi-weekly or monthly).

1	Exists	
---	--------	--

2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

62. The company has an established system for accounting for and rotating its inventories; there is a clear system for defining the company's costs, depending on the characteristics of the products and processes.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Financial Administration**

63. The company has formal financial planning (income and expenditure budget, cash flows, financial ratios, break-even point, etc.).

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

64. The company knows the profitability of each product or product line.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

65. Financial results are compared monthly with budgets, variations are analyzed, and corrective actions are taken.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

66. The company evaluates the utility of its investments in equipment and other fixed assets, and in investments in general.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Legal and Tax Regulations**

67. The company's registration with the Superintendence of Industry and Commerce, Chamber of Commerce, and the SRI (Internal Rental Service) has been evaluated in light of its corporate purpose.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

68. The company's tax calendar is clearly defined, with set dates for filing returns and other documents.

1	Exists	
---	--------	--

2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

69. The company applies the respective indicators to its tax returns, and results are monitored.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

70. The company has a defined tax planning strategy and knows the approximate amounts to be paid in the taxable period for different taxes, fees, and contributions.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

## 6. HUMAN RESOURCES

### General Aspects

71. The company has a written and implemented organizational chart where lines of authority and responsibility are clearly defined.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

72. The company has written policies and procedure manuals known and followed by all personnel.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

73. There is a board of directors that leads the company.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

74. The company complies with all current legal requirements (SRI, IESS, Labor Code, internal work regulations, industrial safety regulations, etc.).

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Training and Promotion**

75. The company has a defined program for training all its personnel, and all new staff are given an induction into the company.

1	Exists	
2	In the process of being documented	
3	Documented	

4	Documented and disseminated	
5	Documented, disseminated, and updated	

76. Personal skills, qualifications, the desire for self-improvement, creativity, and productivity are key criteria for staff remuneration and promotion, as well as for defining the salary scale.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Organizational Culture**

77. There is good oral or written communication across the different levels of the company.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

78. The company ensures that personnel develop a sense of belonging.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

79. Teamwork is encouraged throughout all levels of the company.

1	Exists	
---	--------	--

2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

80. The company has established programs and incentives to improve the work climate.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Occupational Health and Safety**

81. The company has an implemented occupational health program (occupational disease prevention plan, workplace safety, emergency plans, etc.).

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

82. The plant, processes, and equipment are designed to provide a safe environment for the worker.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

83. The company has an industrial safety program to prevent workplace accidents, documents them when they occur, and takes preventive and/or corrective actions.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

84. The company keeps a record of absenteeism caused by illness, workplace accidents, and other causes.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

## 7. ENVIRONMENTAL MANAGEMENT

### Policies

85. In the plant design, the company considered environmental regulations and the well-being of its workers.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

86. The company knows the environmental regulations that govern it and establishes procedures and processes to comply with them.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

87. The company's culture and strategy involve environmental aspects, impacts, and risks.

1	Exists	
---	--------	--

2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

88. The company measures environmental performance against pre-agreed goals and standards.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Strategy to Protect the Environment**

89. The company considers environmental regulations when developing new products or making changes to its physical infrastructure.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

90. Considerations were made for the selection, installation, operation, and maintenance of equipment.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### **Awareness and Training**

91. Specific tasks, responsibilities, competencies, and procedures are defined and documented to ensure compliance with both internal and external environmental standards.

1	Exists	
2	In the process of being documented	

3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Waste Management

92. The company tries to minimize the consumption of energy, water, and polluting raw materials through the improvement of its production processes, recycling, substitution of inputs, preventive maintenance, and the use of other technologies.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

93. The company has measured the amount of waste, knows at what stage of the process it is generated, and has formulated plans to reduce it.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

---

## 8. INFORMATION SYSTEMS

### Planning

94. The company's information system is designed to satisfy the functional information requirements of management and all areas in a timely and reliable manner.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

95. The company is up to date regarding new developments in software and hardware and has the trained personnel to handle them.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

96. The technical and functional design of the system responds to the company's information needs and is optimal in terms of processing time and security.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Inputs

97. Supporting documents are generated and properly filed in the different areas of the company.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

98. Information capture generates simultaneous operations in different areas of the company, avoiding double entry of transactions in different systems.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Processes

99. As a policy, the company systematically makes backup copies of its most important files and stores them in secure locations.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

100. Contingency procedures exist, whether manual or automated, in case of power outages or process equipment failures.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### Outputs

101. The information generated by the system is reliable, timely, clear, and useful, and is used for decision-making.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

102. Management has defined reports that indicate the type of data required for the decision-making process.

1	Exists	
2	In the process of being documented	
3	Documented	
4	Documented and disseminated	
5	Documented, disseminated, and updated	

### APPENDIX B. Interview responses regarding the competitiveness map

#	Variable	Quantity	Exists	In the process of being documented	Documented	Documented and Disseminated	Documented, Disseminated and updated	Average
	<b>Strategic Planning</b>							
1		4				3	1	4.25
2		4				2	2	4.50
3		4				1	3	4.75
4		4				1	3	4.75
5		4				1	3	4.75
6		4				1	3	4.75
7		4				2	2	4.50
8		4				1	3	4.75
9		4			1	2	1	4.00
10		4				2	2	4.50
<b>Total</b>								<b>45.50</b>
<b>Average</b>								<b>4.55</b>

	<b>Value Chain</b>							
11		4			3	1		3.25
12		4				3	1	4.25
13		4				3	1	4.25

14		4				1	3	4.75
15		4			3	1		3.25
16		4			3	1		3.25
17		4				2	2	4.50
18		4			3	1		3.25
19		4				1	3	4.75
20		4			1	3		3.75
21		4			1	3		3.75
22		4				2	2	4.50
23		4			3	1		3.25
24		4			3	1		3.25
25		4			1	3		3.75
26		4				1	3	4.75
27		4			1	3		3.75
28		4				1	3	4.75
29		4				1	3	4.75
30		4			1	3		3.75
31		4				1	3	4.75
32		4				1	3	4.75
33		4			1		3	4.50
34		4				1	3	4.75
35		4			1	3		3.75
36		4			1	3		3.75
<b>Tota l</b>								<b>105.75</b>

<b>Ave rage</b>								<b>4.07</b>
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	<b>Quality Assurance</b>							
<b>37</b>		<b>4</b>			<b>1</b>	<b>3</b>		<b>3.75</b>
<b>38</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>39</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>40</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>41</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>42</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>43</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>Total</b>								<b>31.75</b>
<b>Ave rage</b>								<b>4.54</b>

	<b>Merchand ising</b>							
<b>44</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>
<b>45</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>
<b>46</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>47</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>48</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>
<b>49</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>50</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>

51		4				3	1	4.25
52		4				2	2	4.50
53		4				1	3	4.75
54		4				3	1	4.25
55		4				2	2	4.50
56		4				1	3	4.75
57		4				3	1	4.25
58		4				2	2	4.50
59		4				3	1	4.25
<b>Total</b>								<b>70.75</b>
<b>Average</b>								<b>4.42</b>

	<b>Accounting and Finance</b>							
60		4				1	3	4.75
61		4				1	3	4.75
62		4				1	3	4.75
63		4				1	3	4.75
64		4				1	3	4.75
65		4				1	3	4.75
66		4				2	2	4.50
67		4				1	3	4.75
68		4				2	2	4.50

<b>69</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>70</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>Total</b>								<b>51.25</b>
<b>Average</b>								<b>4.66</b>

	<b>Human Resources</b>							
<b>71</b>		<b>4</b>				<b>0</b>	<b>4</b>	<b>5.00</b>
<b>72</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>73</b>		<b>4</b>					<b>4</b>	<b>5.00</b>
<b>74</b>		<b>4</b>					<b>4</b>	<b>5.00</b>
<b>75</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>76</b>		<b>4</b>			<b>1</b>	<b>2</b>	<b>1</b>	<b>4.00</b>
<b>77</b>		<b>4</b>			<b>2</b>	<b>2</b>		<b>3.50</b>
<b>78</b>		<b>4</b>			<b>2</b>	<b>2</b>		<b>3.50</b>
<b>79</b>		<b>4</b>			<b>1</b>	<b>3</b>		<b>3.75</b>
<b>80</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>
<b>81</b>		<b>4</b>			<b>2</b>	<b>2</b>		<b>3.50</b>
<b>82</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>83</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>84</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>Total</b>								<b>61.00</b>
<b>Media</b>								<b>4.36</b>

	<b>Environm ental Managem ent</b>							
<b>85</b>		<b>4</b>			<b>2</b>	<b>2</b>		<b>3.50</b>
<b>86</b>		<b>4</b>			<b>2</b>	<b>2</b>		<b>3.50</b>
<b>87</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>88</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>89</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>90</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>91</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>92</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>93</b>		<b>4</b>				<b>3</b>	<b>1</b>	<b>4.25</b>
<b>Tota l</b>								<b>39,25</b>
<b>Ave rage</b>								<b>4.36</b>

	<b>Informatio n Systems</b>							
<b>94</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>95</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>96</b>		<b>4</b>				<b>2</b>	<b>2</b>	<b>4.50</b>
<b>97</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>98</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>99</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>100</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>

<b>101</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>102</b>		<b>4</b>				<b>1</b>	<b>3</b>	<b>4.75</b>
<b>Total</b>								<b>42.25</b>
<b>Average</b>								<b>4.69</b>

### APPENDIX C. Calculation of the mean of the competitiveness map

<b>N°</b>	<b>Variable</b>	<b>Quantity</b>	<b>Exists</b>	<b>In the process of being documented</b>	<b>Documented</b>	<b>Documented and Disseminated</b>	<b>Documented, Disseminated and updated</b>	<b>Total</b>	<b>Average</b>
	<b>Strategic Planning</b>								
<b>1</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>17</b>	<b>4.25</b>
<b>2</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>10</b>	<b>18</b>	<b>4.50</b>
<b>3</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>19</b>	<b>4.75</b>
<b>4</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>19</b>	<b>4.75</b>
<b>5</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>19</b>	<b>4.75</b>
<b>6</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>19</b>	<b>4.75</b>
<b>7</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>10</b>	<b>18</b>	<b>4.50</b>
<b>8</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>15</b>	<b>19</b>	<b>4.75</b>
<b>9</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>8</b>	<b>5</b>	<b>16</b>	<b>4.00</b>
<b>10</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>10</b>	<b>18</b>	<b>4.50</b>

	<b>Value Chain</b>								
<b>11</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>4</b>	<b>0</b>	<b>13</b>	<b>3.25</b>
<b>12</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>17</b>	<b>4.25</b>

13		4	0	0	0	12	5	17	4.25
14		4	0	0	0	4	15	19	4.75
15		4	0	0	9	4	0	13	3.25
16		4	0	0	9	4	0	13	3.25
17		4	0	0	0	8	10	18	4.50
18		4	0	0	9	4	0	13	3.25
19		4	0	0	0	4	15	19	4.75
20		4	0	0	3	12	0	15	3.75
21		4	0	0	3	12	0	15	3.75
22		4	0	0	0	8	10	18	4.50
23		4	0	0	9	4	0	13	3.25
24		4	0	0	9	4	0	13	3.25
25		4	0	0	3	12	0	15	3.75
26		4	0	0	0	4	15	19	4.75
27		4	0	0	3	12	0	15	3.75
28		4	0	0	0	4	15	19	4.75
29		4	0	0	0	4	15	19	4.75
30		4	0	0	3	12	0	15	3.75
31		4	0	0	0	4	15	19	4.75
32		4	0	0	0	4	15	19	4.75
33		4	0	0	3	0	15	18	4.50
34		4	0	0	0	4	15	19	4.75
35		4	0	0	3	12	0	15	3.75
36		4	0	0	3	12	0	15	3.75

	<b>Quality Assurance</b>								
37		4	0	0	3	12	0	15	3.75
38		4	0	0	0	4	15	19	4.75
39		4	0	0	0	4	15	19	4.75
40		4	0	0	0	4	15	19	4.75
41		4	0	0	0	8	10	18	4.50
42		4	0	0	0	8	10	18	4.50
43		4	0	0	0	4	15	19	4.75

	<b>Merchandising</b>								
44		4	0	0	0	12	5	17	4.25

45		4	0	0	0	12	5	17	4.25
46		4	0	0	0	8	10	18	4.50
47		4	0	0	0	4	15	19	4.75
48		4	0	0	0	12	5	17	4.25
49		4	0	0	0	8	10	18	4.50
50		4	0	0	0	12	5	17	4.25
51		4	0	0	0	12	5	17	4.25
52		4	0	0	0	8	10	18	4.50
53		4	0	0	0	4	15	19	4.75
54		4	0	0	0	12	5	17	4.25
55		4	0	0	0	8	10	18	4.50
56		4	0	0	0	4	15	19	4.75
57		4	0	0	0	12	5	17	4.25
58		4	0	0	0	8	10	18	4.50
59		4	0	0	0	12	5	17	4.25

	<b>Accounting and Finance</b>								
60		4	0	0	0	4	15	19	4.75
61		4	0	0	0	4	15	19	4.75
62		4	0	0	0	4	15	19	4.75
63		4	0	0	0	4	15	19	4.75
64		4	0	0	0	4	15	19	4.75
65		4	0	0	0	4	15	19	4.75
66		4	0	0	0	8	10	18	4.50
67		4	0	0	0	4	15	19	4.75
68		4	0	0	0	8	10	18	4.50
69		4	0	0	0	8	10	18	4.50
70		4	0	0	0	8	10	18	4.50

	<b>Human Resources</b>								
71		4	0	0	0	0	20	20	5.00
72		4	0	0	0	4	15	19	4.75
73		4	0	0	0	0	20	20	5.00
74		4	0	0	0	0	20	20	5.00
75		4	0	0	0	8	10	18	4.50

76		4	0	0	3	8	5	16	4.00
77		4	0	0	6	8	0	14	3.50
78		4	0	0	6	8	0	14	3.50
79		4	0	0	3	12	0	15	3.75
80		4	0	0	0	12	5	17	4.25
81		4	0	0	6	8	0	14	3.50
82		4	0	0	0	4	15	19	4.75
83		4	0	0	0	4	15	19	4.75
84		4	0	0	0	4	15	19	4.75

	<b>Environm ental Managem ent</b>								
85		4	0	0	6	8	0	14	3.50
86		4	0	0	6	8	0	14	3.50
87		4	0	0	0	8	10	18	4.50
88		4	0	0	0	4	15	19	4.75
89		4	0	0	0	4	15	19	4.75
90		4	0	0	0	8	10	18	4.50
91		4	0	0	0	4	15	19	4.75
92		4	0	0	0	4	15	19	4.75
93		4	0	0	0	12	5	17	4.25

	<b>Informati on Systems</b>								
94		4	0	0	0	4	15	19	4.75
95		4	0	0	0	8	10	18	4.50
96		4	0	0	0	8	10	18	4.50
97		4	0	0	0	4	15	19	4.75
98		4	0	0	0	4	15	19	4.75
99		4	0	0	0	4	15	19	4.75
100		4	0	0	0	4	15	19	4.75
101		4	0	0	0	4	15	19	4.75

10		4	0	0	0	4	15	19	4.75
2									