

**SIBERIA CEIBAS, ECONOMIC
DEVELOPMENT HIVE**



**Rotary Club: Neiva Las Ceibas, Rotary District:
4281**

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INTRODUCTION

Beekeeping, the activity dedicated to the breeding of bees and the production of honey and other derived products has experienced growing global interest in recent decades. This increasing attention is due to several factors, including the recognition of honey's nutritional value, its medicinal properties, its vital role in the pollination of crops and the conservation of biodiversity. Globally, beekeeping production has shown sustained growth, although with significant regional variations. According to FAO data, global honey production exceeds several million tons annually, with countries like China, Turkey and Argentina leading the list of top producers. These countries, in addition to supplying their internal markets, are important honey exporters worldwide, mainly to Europe, the United States, and Asia.¹

Over the past decade, the number of beehives has steadily increased worldwide. The number has risen from less than 81 million in 2010 to approximately 100 million in 2022. This trend is largely due to the positive reception that the sweet, viscous liquid has produced in the population. In fact, the global honey market size was estimated at around USD 9.4 billion, in 2023 and it is expected to exceed USD 14,5 billion by 2032 (Statista, 2022).

However, beekeeping production faces challenges such as the decreasing bee populations due to factors like climate change, pesticide use, and diseases. Despite these challenges, the honey market and its derivatives continue to expand by the increase in demand for natural and healthy products.

Colombia, with its vast diversity of ecosystems and rich flora, holds significant potential for the development of beekeeping. However, domestic honey production still falls short of its full capacity. When compared to other countries in the region, Colombia's production remains relatively low. According to the Ministry of Agriculture, the country currently has 135.590 beehives, producing 3.851 tons of honey annually, with a per capita consumption of just 77 grams of honey. In 2019, the total value of honey production reached COP 41.480 billion, providing employment for approximately 9000 people.

The beekeeping chain in Colombia consists of 10 departmental committees which include representatives from various sectors, such as producer associations, companies in the industry and support institutions at the regional level.

The department of Huila, with its varied climates and rich biodiversity, offers favorable conditions for the development of beekeeping. However, honey production in Huila still presents significant untapped potential. While there are local producers engaged in this activity, production remains dispersed and often lacks the necessary tools and knowledge to optimize production processes and improve product quality. In the department of Huila, beekeeping has gained significant traction, as the local government and institutions have promoted the practice of this agricultural activity, emphasizing the critical role bees play in food production processes and biodiversity in crops (Awad, 2017). Since 2019, the department has produced between 200 and 300 tons of honey annually, ranking as the fifth largest honey producer in Colombia.

Beekeeping represents an opportunity for economic and social development in the Department of Huila. Through the implementation of projects like the one proposed, beekeeping production can be strengthened, the quality of life for beekeepers can be improved and Huila's apicultural products can be positioned in both national and international markets.²

¹ <https://es.statista.com/estadisticas/612365/principales-paises-productores-de-miel-a-nivel-mundial/>

² <https://sioc.minagricultura.gov.co/Apicola/Documentos/2020-09-30%20Cifras%20Sectoriales.pdf>

PROJECT DESCRIPTION

The Rotary Club Neiva Las Ceibas, in partnership with the community, the Regional Corporation of the Alto Magdalena (CAM), the highest environmental authority in the Department of Huila, the National Learning Service (SENA), the Chamber of Commerce of Huila and other strategic allies, will implement a sustainable beekeeping project in the Siberia Ceibas Regional Natural Park. This will involve the installation of 20 apiaries with 400 beehives, benefiting 20 families, with priority given to women heads of household and young people affected by poverty, unemployment, and lack of opportunities. The Project will be developed as follows:

- 1. TRAINING AND EDUCATION:** The beneficiaries will receive 280 hours of certified beekeeping training offered by SENA. This training will include techniques for managing apiaries, phytosanitary control, production, harvesting, packaging, and marketing of honey and its by-products (pollen, propolis, beeswax, and bee nuclei).
- 2. INSTALLATION OF APIARIES:** With funding from the grant, each family group will receive all the necessary equipment and supplies for the installation and maintenance of twenty beehives, including protective gear, tools for harvesting, and materials for packaging and storing products.
- 3. CONTINUOUS TECHNICAL ADVISORY:** The company APISRED, a honey producer and marketer, will provide on-site technical support to ensure the proper management of the apiaries and the quality of the products.
- 4. BUSINESS DEVELOPMENT AND MARKETING:** The Chamber of Commerce of Huila will train the community in business formalization, cooperatives and commercial development. Additionally, it will provide support to obtain brand registration and the certificate of unique Origin, which will enable producers to market their products in national and international markets.

1. PROBLEM DEFINITION

1.1 PROBLEM DESCRIPTION

Beekeeping in Latin America has ancestral roots dating back to ancient civilizations, who valued bees not only for their honey but also for their role in their worldview. With the arrival of Europeans, new species and techniques were introduced, leading to a rich diversity of beekeeping practices in the region. Beekeeping in our region has a long history, dating back to pre-Colombian times. Since then, this activity has demonstrated great adaptability, constantly evolving to meet the demands of an increasingly demanding market (Zapata & Rivera, 2019, p. 13).

Latin American beekeeping has shown remarkable adaptability over the centuries. From the traditional techniques of indigenous peoples to the incorporation of modern technologies, beekeepers have learned to harness the resources of their ecosystems and respond to market demands. Honey and other hive products have made beekeeping a key activity in gastronomy, cosmetics, and medicine, thanks to their multiple benefits. However, the beekeeping sector faces obstacles such as competition from imported products and the presence of adulterated goods, which has generated distrust among consumers and harmed the reputation of high-quality honey.

Beekeeping, the activity dedicated to the breeding of bees and the production of honey and other hive products, has experienced significant growth globally in recent decades. This boom is largely due to the recognition of the multiple benefits that hive products provide to human health, as well as their growing demand in industries such as food, cosmetics, and pharmaceuticals.

On a global scale, beekeeping faces challenges such as climate change, the indiscriminate use of pesticides, habitat loss, and the emergence of diseases that affect bees. However, there are also initiatives to promote sustainable beekeeping, the conservation of bees, and research into new technologies to improve production and the quality of beekeeping products. Major honey producers worldwide include China, Argentina, the United States, Mexico, and Turkey. These countries have large areas dedicated to beekeeping and have developed sophisticated production and marketing systems.

In Colombia, beekeeping has experienced steady growth in recent years, driven by the increase in both domestic and international demand for honey and other hive products. The country boasts a great diversity of ecosystems that favor the development of beekeeping, resulting in a wide variety of honeys with unique organoleptic characteristics. According to the Ministry of Agriculture and Rural Development, honey production in Colombia exceeds 3,800 tons annually, with an increasing number of hives distributed across different regions of the country. The main honey-producing departments are Meta, Antioquia, Sucre, Córdoba, and Huila.

The Department of Huila, located in the Andean region of Colombia, stands out for its beekeeping potential due to its favorable climatic and geographic conditions. The region has a diverse flora that provides bees with a wide variety of nectar and pollen, which is reflected in the quality and taste of the honey produced. Although specific data on honey production and the number of hives in Huila is not readily available, it is known that beekeeping is an important economic activity for many rural families in the region. Honey produced in Huila is valued for its organoleptic properties and is marketed both locally and nationally.

Beekeeping products have a significant impact on various markets, including:

Food Market: Honey is used as a natural sweetener, an ingredient in bakery and pastry products and as a base to produce alcoholic beverages.

Cosmetic Market: Honey, beeswax, propolis, and royal jelly are used in the production of creams, soaps, shampoos and other beauty products due to their moisturizing, regenerating and antibacterial properties.

Pharmaceutical Market: Beekeeping products are used in the production of medications for treating various ailments, such as respiratory infections, skin problems and immune system disorders.

Tourism Market: Beekeeping tourism has become an increasingly popular activity, allowing visitors to learn more about the world of bees and enjoy hive products.

Beekeeping is an economic activity of great importance at the global, national, and regional levels. Despite the challenges it faces, beekeeping offers numerous environmental, social and economic benefits. In Colombia and in Huila, beekeeping has significant development potential, thanks to the natural wealth of these regions and the growing consumer interest in natural and healthy products.

1.2 PROBLEM FORMULATION

Given the increasing consumer demand for natural and healthy products, along with the growth potential of the beekeeping market in the Huila Department, is an associative beekeeping production model viable for the families of the Siberia-Ceibas Regional Natural Park that would contribute to income generation and improve their quality of life?

2. JUSTIFICATION

The growing interest in beekeeping products, both locally and internationally, is primarily driven by the increasing demand for natural and chemical-free options. These products, made through environmentally friendly processes, not only meet consumer needs but also play a crucial role in the conservation of the natural environment. According to Caicedo (2022), the Colombian market presents significant opportunities for entrepreneurs in the beekeeping industry, especially for those specializing in natural and sustainable products. Additionally, the export potential of these products to international markets adds considerable value, highlighting the global reach and relevance of this initiative.

The Siberia-Ceibas Regional Natural Park, an area of vital ecological and social importance, represents an ideal setting for implementing a beekeeping project that would not only generate economic benefits for the communities of Motilón, La Plata and San Miguel, it also contributes to ecosystem conservation and improve the quality of life for its inhabitants.

In this context, the proposed business plan for creating a beekeeping products company in Siberia-Ceibas, Neiva - Huila, Colombia, is based not only on its commercial appeal but also on the positive impact it could have on the local economy and the community. Particularly in the rural sector, where both direct and indirect employment opportunities can be developed. As a result, the project is not only justified from an environmental and social perspective but also holds strong economic and technical merit for the Siberia-Ceibas park.

Environmental Justification

Pollination: Bees are key natural pollinators for the reproduction of numerous plant species, contributing to biodiversity conservation and the restoration of degraded ecosystems.

Biological Indicators: The presence and health of bee colonies can serve as indicators of environmental quality, alerting to the presence of pollutants or changes in the ecosystem.

Synergy with Conservation: Beekeeping can complement other conservation activities, such as reforestation and habitat restoration, creating a multiplying effect in the protection of the park.

Social and Economic Justification

Income Generation: The sale of beekeeping products (honey, propolis, beeswax, etc.) can become an additional income source for rural families, improving their living conditions.

Improvement of Quality of Life: The project could contribute to the overall well-being of local communities by creating economic opportunities and promoting social development.

Local Development: The project can stimulate local development through the creation of small beekeeping businesses and cooperatives, generating employment and strengthening the rural economy.

Food Security: The production of honey and other beekeeping products can contribute to improving food security for local communities by providing nutritious and high-quality foods.

Community Empowerment: Active community participation in the project strengthens social fabric, boosts self-esteem and provides tools to improve quality of life.

Specific Justification for the Siberia-Ceibas Park

Climatic and Geographical Conditions: The park has favorable climatic and geographical conditions for beekeeping, with a diverse range of flora providing bees with abundant nectar and pollen.

Local Population: The communities of Motilón, La Plata and San Miguel are facing multidimensional poverty. They would benefit significantly from the additional income generated by beekeeping.

Conservation of the Park: Implementing sustainable beekeeping practices can contribute to the park's conservation by raising awareness about the importance of biodiversity and promoting the sustainable use of natural resources.

The beekeeping project in the Siberia-Ceibas Regional Natural Park represents a unique opportunity for both conservation and biodiversity through pollination and monitoring of ecosystem health; improving the quality of life for residents by generating income, employment and strengthening social cohesion while promoting sustainable development through the production of healthy food and conservation of natural resources.

This project aligns with the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), by providing healthy food and diversifying community incomes. It also contributes to SDG 8 (Decent Work and Economic Growth) by generating employment and fostering local development. Finally, by promoting sustainable beekeeping practices, the project supports SDG 12 (Responsible Consumption and Production), reducing environmental impact and encouraging a healthy lifestyle.

This beekeeping project is more than just a productive initiative; it is a step toward a more sustainable and equitable future for the communities of Siberia-Ceibas Park. By cultivating honey, we are not only feeding people but also nourishing our communities. By generating employment and promoting sustainable practices, we are building a more prosperous future for all. This project is an investment in our planet and the people who inhabit it.

3. OBJETIVES

3.1 GENERAL OBJECTIVE

To contribute to income generation and improve the quality of life for the families of the Siberia-Ceibas Regional Natural Park through the implementation of an associative beekeeping production model.

3.2 SPECIFIC OBJECTIVES

- To design a business plan as a guiding document to be implemented in the associative production model for beekeepers, which will contribute to its sustainability.
- To promote the associativity of the families in the Siberia-Ceibas Regional Natural Park through a formal and autonomous collaborative model, which will foster and develop both individual and collective capacities.
- To strengthen the public and private institutional relationships for the support and development of technical, administrative, commercial, financial, and environmental capabilities within the framework of a comprehensive training process.

4. REFERENTIAL FRAMEWORK

4.1 THEORETICAL FRAMEWORK

The theoretical framework for this project is built on two fundamental pillars. First, the administrative theory will be addressed, with an emphasis on concepts such as strategic planning, market analysis, financial management, and marketing. These concepts will be essential in designing a solid and viable business plan for the beekeeping enterprise. Secondly, the technical aspects of beekeeping will be explored, including hive management, queen production, disease control, and honey extraction. The combination of these two approaches will allow for the development of a sustainable and profitable business model, tailored to the specific characteristics of the Siberia-Ceibas Regional Natural Park.

4.1.1 Business Plan

From a theoretical perspective, the development of a business plan is grounded in the concept of a business model. The business model is understood as a set of interrelated elements that describe the value creation logic of an organization. The Business Model Canvas, for instance, proposes a structured analysis of nine components that allow for an integrated view of the company's value proposition.

The business plan is a formal document that systematizes the vision, mission and objectives of an organization. Through an exhaustive analysis of the environment and available resources, this tool provides a roadmap for achieving business sustainability and growth (Gaytán Cortés, J. 2020)³.

Martínez (2014) emphasizes that the business plan is a living, dynamic process that guides a company from its conception to its consolidation. This instrument articulates the business vision, sets clear objectives and defines the strategies necessary to achieve them and adapting to changing market conditions.

4.1.2 Market Analysis

A market study is an essential tool for any company wishing to make informed strategic decisions and improve its competitiveness in the market. By thoroughly understanding its consumers, competitors, and market trends, companies can develop more attractive and relevant products and services for their customers.

The market is the dynamic environment where the exchange of goods and services between companies and consumers occurs. Understanding this environment is crucial for any organization wishing to succeed. Market research helps identify consumer needs and preferences, assess competition and detect new business opportunities. Through market segmentation, companies can design tailored marketing strategies that meet the specific needs of each consumer group. Furthermore, analyzing market trends allows companies to anticipate changes and ensure their long-term survival and growth (Navarro, A. B. 2012).

Bonilla (2013) underscores the importance of projects anticipating and adapting to environmental changes. This involves analyzing factors such as the economic, socio-cultural, and competitive context, as well as deeply understanding the target consumer and the geographical market.

4.1.3 Technical Study

The technical study is an in-depth investigation that analyzes the technical feasibility of a project. In other words, it is a detailed analysis that determines if a project is technically viable. This study focuses on the operational, engineering, and technical aspects of the project, ensuring that the necessary resources and technology are available for its execution.

According to Santos (2008), the technical study is a fundamental tool in the planning and execution of projects, as it provides a solid foundation for decision-making. By evaluating technical feasibility, the study

³ Gaytán Cortés, J. (2020). El plan de negocios y la rentabilidad. *Mercados y negocios*, 21(42), 143-156.

ensures that the project is viable from an operational perspective and that the required resources are available.

4.1.4 Feasibility Study

A feasibility study is a thorough analysis that assesses the viability of a project, whether it be business, technological or social. It is like a roadmap that indicates if your idea is feasible and provides the necessary tools to make informed decisions before investing time and resources.

The feasibility study is an analytical process that evaluates the feasibility of a project from multiple perspectives. By examining aspects such as the market, technology, economy, and legal framework, this study provides a comprehensive view of the project. According to Ferrer and Garzón (2020), the main objective is to determine whether the project is sustainable in the long term and whether it will generate the expected results. In addition to identifying opportunities, the feasibility study also reveals potential obstacles and risks, allowing entrepreneurs and organizations to take preventive measures and develop mitigation strategies.

4.1.5 Beekeeping Production

Beekeeping production refers to the agricultural and economic activity focused on the breeding and management of bees to obtain products such as honey, beeswax, pollen, propolis, and royal jelly, among others. This practice is fundamental not only for food production but also for the crucial role that bees play in pollinating crops and plants, which contributes to biodiversity and agricultural production in general.

4.1.6 Associative Work Model

The Associative Work Model is an approach centered on collaboration and cooperation among different actors, whether individuals, organizations, or communities to achieve common goals. This model is based on the idea that the combined efforts and resources of various parties can generate more effective and sustainable results than isolated work.

It is a form of business organization in which a group of people comes together to work jointly toward common goals. In this model, members contribute their skills, knowledge, and resources to carry out productive projects or activities.

4.1.7 Commercial Partner

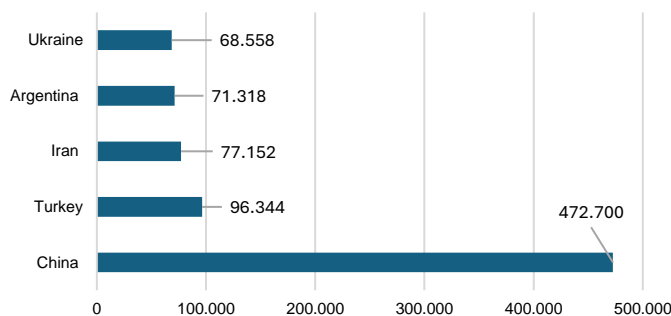
The concept of a "Commercial Partner Model" refers to a strategic approach in which companies establish collaborations and partnerships with other organizations to achieve common business objectives. This model is based on the idea that by working together, companies can leverage their individual strengths, share resources and knowledge and access new markets or customer segments that would otherwise be difficult to reach independently. Through partnerships, companies can enter markets where the other party already has a presence or knowledge, thus facilitating expansion.

5. MARKET COMPONENT

5.1 International Market Analysis

The global production of bee honey has shown a dynamic trend in recent years, with a particular focus on the five countries that lead both in production and exportation. For the years 2020 and 2022, the most recent data indicates the following:

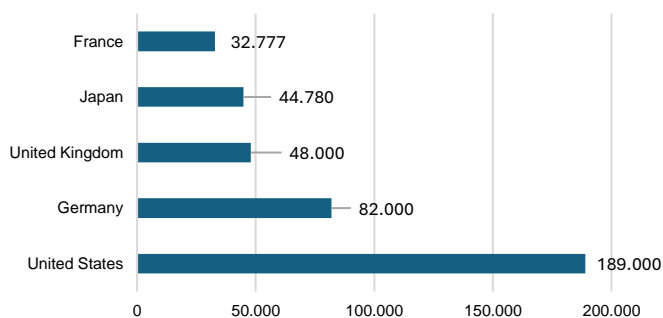
**Figure No 1. Main Honey-Producing Countries
Tons / 2022.**



Source: FAO Statistics Division (FAOSTAT)

China reaffirmed its leadership in global honey production in 2022, with a volume of 472,700 metric tons, accounting for approximately a quarter of the global total. It was followed by Turkey (96,344 tons), Iran (77,152 tons), Argentina (71,318 tons) and Ukraine (68,558 tons), showing a significant gap between the Asian giant and its main competitors. Colombia ranks as the 40th largest honey producer in the world and in Latin America, there are six countries that produce more honey than Colombia.

**Figure No 2. Main honey importing countries
Tons / 2019.**



Source: FAO Statistics Division (FAOSTAT)

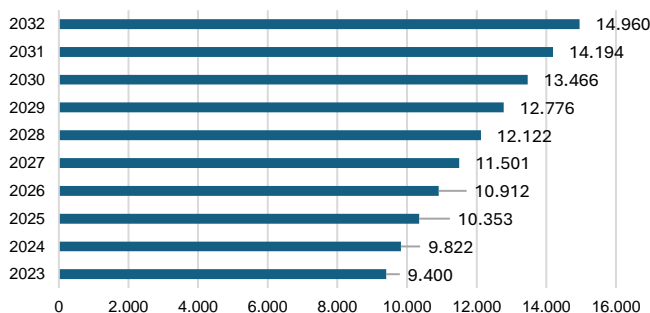
The global market for natural honey saw strong demand in 2019, particularly in countries like the United States, which imported 189,000 tons. Germany (82,000 tons), the United Kingdom (48,000 tons), Japan (44,780 tons) and France (32,777 tons) completed the top five largest importers, highlighting the importance of these markets for global honey trade and contributing to meeting the growing worldwide demand for this product.

5.1.1 International Market Value

The honey market has experienced steady growth in recent years, driven by the increasing demand for natural and healthy products. This trend is reflected in the rise in the number of beehives worldwide, which grew from fewer than 81 million in 2010 to nearly 100 million in 2022.

In 2022, the global honey market was valued at approximately United States dollars 9.79 billion, with a projected compound annual growth rate (CAGR) of 6.3% through 2028. However, in 2023, there was a slight contraction, bringing the market to around USD 9.4 billion. Despite this fluctuation, strong growth is expected in the coming years, with the market projected to reach USD 14.96 billion by 2032⁴

Figure No 3. Projection of Honey Market Size Worldwide from 2023 to 2032



Source: Statista 2024

In the figure, a steady increase in honey prices is projected. Between 2023 and 2032, it is estimated that the price will rise from USD 9,410 to USD 14,960, representing a total increase of approximately 58% over the analyzed period. To better understand the price growth of honey during these years, the compound annual growth rate (CAGR) can be calculated. This calculation reveals that the price will grow from USD 9,410 to USD 14,960, which equates to an approximate growth rate of 5.6%. This data suggests that the honey market is not only expanding in terms of volume but also in value.

The international honey market shows a favorable growth trajectory, with price projections reflecting both increasing demand and the growing value of the product. This trend is expected to continue, driven by changes in consumer preferences toward healthier and more natural options, the development of the cosmetics and pharmaceutical industries and the positioning of honey as a natural substitute for sugar.

The global honey market was valued at USD 2.252 billion in 2020. Countries such as China, Turkey, Iran, Argentina, India, and Brazil positioned themselves as the leading exporters, concentrating 54.2% of the market, capitalizing on the growing demand in markets such as the United States and the United Arab Emirates, where international prices exceed domestic prices. However, challenges such as climate change and bee diseases pose threats to the sustainability of the sector.

Several factors, including the growing consumer interest in health benefits and the diversification of industrial uses, have driven a significant increase in global honey production and trade. In 2019, the average export price of honey was more than three times higher than the domestic price, according to Castro and Callejas (2021), highlighting a considerable profit margin in markets like the United Arab Emirates and the United States. In 2020, global honey trade experienced a 13% growth in value and 11% in volume, reaching USD 2.252 billion and 711,000 tons, respectively. China, Turkey, Iran, Argentina, India and Brazil solidified their positions as the primary market players, concentrating more than half of the total volume traded.

⁴ <https://es.statista.com/estadisticas/1008993/tamano-del-mercado-mundial-de-miel/#:~:text=En%202023%2C%20el%20tama%C3%B1o%20del,9.400%20millones%20de%20d%C3%B3lares%20estadounidenses.>

5.2 Analysis of the Domestic Market

Colombia has experienced notable growth in its beekeeping sector in recent years. By 2021, the country had 140,335 beehives, primarily concentrated in the Andean, Atlantic, and Orinoquía regions. This activity generated approximately 9,000 direct jobs, of which 3,000 are permanent and 6,000 are seasonal. The country produced 4,650 tons of honey. The average yield per hive was 29 kilograms and the internal per capita consumption was estimated at 77 grams.

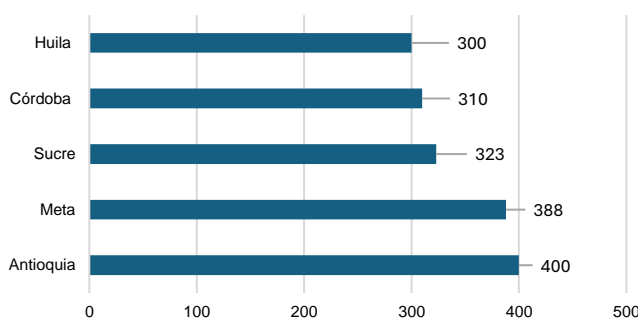
Chart No 1 Domestic Honey Production

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
No. Hives	89.200	87.000	88.111	92.793	95.419	97.219	100.881	110.689	120.437	135.117	135.590	140.335
Production (Tons)	2.630	2.350	2.378	2.691	2.958	3.111	3.228	3.542	3.3372	3.838	3.851	4.650

Source: Ministry of Agriculture and Rural Development / Beekeeping and Honey Production Chain 2021.

The data in the table clearly show a relationship between the increase in the number of hives and the growth in honey production in Colombia. Between 2010 and 2021, the country went from having 89,200 hives and producing 2,630 tons of honey to 140,335 hives and a production of 4,650 tons, respectively. In Colombia, the beekeeping value chain includes the production of honey, pollen, propolis, wax, royal jelly, and larvae. However, most of this production has focused on honey (Agrocadenas, 2006). Honey production in Colombia is primarily concentrated in the Andean Region, which, with 12 departments, contributes 49% of national production (1,874 tons). The Caribbean Region, with 8 departments, and the Orinoquía Region with 4 departments, contribute 31% (1,211 tons) and 19% (711 tons) of the total production, respectively. It is worth noting that the Andean Region also stands out in pollen production.

**Figure No 4 Main honey-producing departments in Colombia
Tons / 2019.**



Source: Ministry of Agriculture and Rural Development / Beekeeping and Honey Production Chain 2021.

The figure reveals a variation in honey production across the five main honey-producing departments in Colombia in 2019. Antioquia emerged as the largest producer, with 400 tons annually, followed by Meta (388 tons), Sucre (323 tons), Córdoba (310 tons) and Huila (300 tons).

Antioquia, Meta, Sucre, Córdoba and Huila are the main honey-producing departments in Colombia, together accounting for 50% of the national production. Additionally, Boyacá and Cundinamarca stand out for their production of pollen, reaching approximately 600 tons annually, according to the National Beekeeping Chain Council. However, the beekeeping sector faces the challenge of honey imports, which significantly increased between 2017 and 2018, rising from 140 to 389 tons. This situation is attributed to the low international honey prices, which contrast with the local prices, ranging between 8.000 and 12.000 pesos per kilogram.

Colombian beekeeping, with approximately 7.168 apiaries and an average of 30 hives per apiary in 2022, has shown a growing interest in pollen production, a sector globally dominated by China and by Spain in the European Union. In Colombia, the main producers of pollen are concentrated in the departments of Boyacá, Norte de Santander, Cundinamarca, Santander and Guaviare. It is also important to highlight that, in addition to honey and pollen, bees produce other high-quality products and raw materials such as royal jelly, propolis, and wax and bee venom.

Beekeeping is promoted by the government as an alternative for productive development. This initiative is part of institutional programs aimed at eradicating illegal crops and illegal mining as well as productive strategies to adapt to the effects of climate change in high-mountain areas. It is essential to emphasize that beekeeping in Colombia is typically part of the family farming economy. When carried out following good beekeeping and agricultural practices, this activity demonstrates a sustainable use of biodiversity.

The beekeeping sector in Colombia has reached an estimated annual production of 3,838 tons of honey, with an approximate value of COP 37.000 millions. Bees also play a key role in crop pollination, a service valued at COP 556.000 millions. Despite its importance, this service is considered intangible and as such, often receives insufficient compensation compared to other regions in the world. For instance, in areas of North America, East Asia and Europe, the cost of pollination per hectare can reach up to USD 1,500 (MADR, 2019).

In the last two years, honey production in Colombia has experienced a growth of approximately 15% to 20%, driven by the El Niño phenomenon. However, with the arrival of the La Niña phenomenon, a significant reduction in production is expected. In the two previous years marked by La Niña, beekeeping production was considerably affected.⁵

National market prices for honey producers are determined by supply and demand conditions, which in turn depend on the climatic factors specific to each producing region. Furthermore, these prices are closely linked to the product's quality and the level of production. Below are the average prices according to the National Beekeeping Chain Council.

CHART No 2 Honey and Pollen Market Prices

Price Range of Honey

Production Honey Level	Departments	Price Range	
High	Antioquia	\$ 8.000 Kg	\$ 15.000 Kg
	Córdoba		
	Sucre		
	Huila		
Low	Cundinamarca	\$ 18.000 Kg	\$ 20.000 Kg
	Boyacá		

Price Range of Pollen

Pollen Production Level	Departments	Price Range	
High	Cundinamarca	\$ 20.000 Kg	\$ 25.000 Kg
	Boyacá		
Low	Departamentos no productores	\$ 28.000 Kk	\$ 30.000 Kg

Source: National Beekeeping Chain Council 2018

⁵ <https://www.agronegocios.co/agricultura/una-tonelada-de-miel-puede-costar-hasta-18-millones-3894209>

The price paid to the producer in 2017 for honey and pollen varies by region. In highly productive honey-producing areas such as Sucre, Córdoba, Huila and Antioquia, prices are reported between 8.000 and 15.000 pesos per kilogram. In contrast, departments such as Cundinamarca and Boyacá pay between 18.000 and 20.000 pesos per kilogram. Regarding the price of pollen, in Cundinamarca and Boyacá, the price for dry pollen per kilogram is between 20.000 and 25.000 pesos, while in other non-producing departments, it reaches between 28.000 and 30.000 pesos (Departmental Committees of the CPAA, 2018).

At the national level, the Ministry of Agriculture and Rural Development is dedicated to strengthening the beekeeping sector, for which it has established the Departmental Committees as a support structure for the productive chain. This chain is made up of ten departmental committees, composed of representatives from different links in the value chain, including producer associations, sector companies and support entities at the departmental level. The Agriculture Secretariats of each department are responsible for providing the technical secretariat necessary for the functioning of these committees.

Similarly, in 2008, the Colombian Federation of Beekeepers and Beekeeping Breeders, **FEDEABEJAS**, was created as a second-tier organization of private law, non-profit, and national character, aimed at uniting legally established beekeepers' and honey producers' associations. Subsequently, in 2012, the Ministry of Agriculture and Rural Development issued Resolution No. 282, which recognizes the Organization of the Beekeeping and Honey Productive Chain.

Currently, the federation has a board of directors composed of representatives from national-level producer organizations, as follows:

Chart No 3 Board directors of FEDEABEJAS

Organization	Representative	Department	Position
ASOAPICUN	Fabio Díaz Granados	Cundinamarca	President
COOAPICA	Yaneth Aguilar	Cauca	Vice president
COAPI	Susana Jiménez	Huila	Secretary
APISRED	Francisco Silva	Huila	Treasurer

Source: FEDEABEJAS 2024

Chart No 4 Main Beekeeping Associations

Producers' organization	Name	Location
Asociación Rural de Productores Apícolas de Sucre	ARPA	Sincelejo - Sucre
Asociación de Apicultores de Boyacá	ASOAPIBOY	Tunja – Boyacá
Asociación de Apicultores Conservacionistas de la Sierra Nevada de Santa Marta	APISIERRA	Santa Marta – Magdalena
Asociación de Apicultores de la Región del Sumapaz	ASOAPIS	Fusagasugá - Cundinamarca
Asociación de Apícola Comunera	ASOAPICOM	Socorro - Santander
Asociación de Apicultores de Betania	ASOAPIBE	Betania - Antioquia
Cooperativa Integral de Apicultores del Cauca	COOAPICA	Popayán – Cauca
Asociación Municipal de Productores Apícolas de Sincé	AMAPIS	Sincé – Sucre
Cooperativa Multiactiva de Apicultores Orgánicos Montes de María	COOAPOMIEL	Carmen de Bolívar – Bolivar
Asociación Campesina para la Agroecología en la Cuenca del Rio Guejar	AGROGUEJAR	Villavicencio – Meta
Asociación Agropecuaria ASOEAT	ASOEAT	Zambrano - Bolivar
Apicultores Colombianos Educando y Formando para el Futuro	APISRED	Neiva - Huila
Cooperativa Integral de Apicultores del Huila	COOAPI	Neiva - Huila
Asociación de Apicultores de Iquira	APIIQUIRA	Iquira – Huila
Asociación de Apicultores de Garzón	ASOAPIS	Garzón – Huila
Asociación de Apicultores del Sur Colombiano	ASOAPISURCO	Algeciras - Huila

Source: FEDEABEJAS 2024

Chart No 5 main Buyers

Company	Address	Contact	City
APINAL	Cl. 16 #12-18	314-3570150	Bogotá
DISTRIAPICOLA	Cl. 9 # 11 - 39	mercadeo@distriapicola.co	Caicedonia - Valle
RED ECOLSIERRA	Km 3 Vía Gaira, Parque Logístico Industrial PAS, Bodega A13	info@redecolsierra.org 315 7413082	Santa Marta, Magdalena
Apiarios El Pinar CIA LTDA	Cra 7C No.180-31 Central de Abastos del Norte – Codabas	info@apiarioselpinar.com 313-6536875	Bogotá

Source: Own source

5.3 Regional Market Analysis

The department of Huila, with its diverse climatic and geographical conditions, has fostered the development of a significant beekeeping industry. The production of honey and other hive products has become a source of income for many local producers, contributing to the economic development of the region. This section aims to analyze the current state of the beekeeping sector in Huila, identifying key players, challenges and opportunities for future growth.

To strengthen beekeeping in Huila, the **Regional Beekeeping Committee** was created in 2023. This committee composed of producers, public entities and associations and supported by the Ministry of Agriculture and Mining, is connected to the national network of the **Beekeeping and Honey Chain (CPAA)**, recognized by the Ministry of Agriculture. The creation of this committee represents a milestone in formalizing and consolidating the beekeeping value chain in the department. The **Corporación Autónoma Regional del Alto Magdalena (CAM)** participates in the Regional Beekeeping Committee as the governing body for environmental matters. With the aim of strengthening the beekeeping value chain. CAM, through its **Green Business** strategic line, will focus on developing the transformation segment, promoting sustainable practices and adding value to final products.

Huila has stood out in honey production in Colombia. In 2014, the department reached its peak, ranking second nationally with a production of 320 tons, accounting for 11.4% of the total. However, in recent years, production has fluctuated, ranking fifth in 2021, with an annual production range between 200 and 300 tons.

In Huila, approximately **1200 beekeepers** are dedicated to the breeding of *Apis Mellifera*, producing honey, pollen, propolis and other derivatives. About **70%** of them are organized into associations and cooperatives, while **30%** work independently. To date, COP **3.940.783.000** have been invested in the beekeeping sector, with a contribution of COP **\$82.685.000** from the Departmental Government.

CHART No 6 Main Honey-Producing Municipalities in Huila

Zones	Municipality	No. Hives	Production in Kg
North	Algeciras	760	22.800
	Rivera	450	22.500
	Neiva	610	18.000
West	La Plata	145	5.800
	Tesalia	140	4.200
	Paicol	95	2.375
Center	Garzón	1.150	36.800
	Gigante	350	12.600
	Pital	240	7.200
	Suaza	155	5.580
	Tarqui	170	4.760
South	Pitalito	1.200	100.000
	San Agustín	765	45.900
	Timana	500	28.000
	Oporapa	150	6.750

Source: (Department of Huila, 2022)

Pitalito stands out as the leading honey producer in Huila, accounting for approximately 40% of the total production of the department with 100,000 kilos. It is followed by Garzón (15%), Algeciras (9%) and La Plata (2%). These differences may be related to factors such as the extent of beekeeping areas, climatic conditions and availability of water resources in each region.

In Huila, most beekeepers are organized into non-profit associations, promoting a solidarity-based economy. This form of organization strengthens the competitiveness of the sector, expands market access, enhances the capabilities of producers and contributes to the sustainable development of the region.

The Cooperativa Integral de Apicultores del Huila (COAPI) is a benchmark in sustainable beekeeping in the country. With a network of about 80 beekeepers spread across 13 municipalities, COAPI produces between 10 and 12 tons of honey annually, along with a wide range of derivative products such as propolis, royal jelly, and wax. Through agroecological practices and the commercialization of high-quality products, COAPI contributes to ecosystem conservation, generates income for rural communities and positions Huila honey as an excellent product in both national and international markets.

CHART No 7 Beekeeping Producer Associations

Municipal Associations Registered with ACOAPI	Municipality	Association
North	Aipe	Agro Sandiego ASOBOSPA
	Baraya	ASOAPIABA
	Tello	
	Colombia	ASOCOLH
	Algeciras	COOAPIAL
	Palermo	APISURCO
	Campoalegre	
	Hobo	APIC HUILA
	Santa María	El Bache
	Iquira	APIIQUIRA
Yaguará		
West	La Argentina	botón de Oro
Center	Garzón	ASOAPIS
	Tarqui	AG Café Especial
South	Pitalito	ASAP
	Acevedo	
	Palestina	
	Suaza	
	San Agustín	APIMACO
	Timana	APISGAITANA
Total Members 315	Coverage 67.5%	

Source: (Department of Huila, 2022)

The beekeeping sector in Huila is highly organized, with 15 legally established associations representing more than 65% of the beekeepers in the department. These associations, grouped into four geographic zones, work in collaboration with the Integral Cooperative of Beekeepers of Huila (COAPI) to improve production, quality and marketing of honey and other hive products. Thanks to this solid organizational structure, beekeepers in Huila have managed to access new markets, increase their income and strengthen the sustainability of their activities.

At the same time, companies like APISRED, recognized for its wide range of beekeeping products and sustainable practices, complement this value chain, helping position Huila as a national benchmark for honey and hive product production.

Despite this, beekeeping in Huila as a productive activity has not yet been fully valued or exploited as a wealth-generating sector in the producing areas. Its current low productivity limits its potential to become a significant source of income for beekeepers, relegating it to a marginal or supplementary activity alongside other livelihoods. However, the regional government, through the Huila Ministry of Agriculture and Mining, has been working to strengthen this sector. To date, a total investment of COP 3.940.783.000 has been made, with COP 82.685.000 of the funds coming from the local government's own resources.

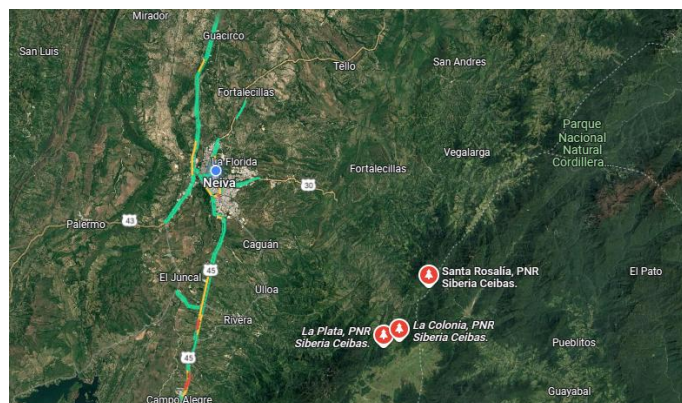
Additionally, an investment of COP 1,656,259,880 has been obtained through the general royalties sector, complemented by a significant contribution from associations, commercial partners, the Ministry of Agriculture and local municipalities, bringing the total to approximately COP 2,000,201,838. The Huila government has also provided support to 37 beekeepers from Baraya and Yaguará, facilitating the development of productive infrastructure and enhancing agricultural marketing, with an investment exceeding COP 93 million in local resources.

5.4 Project Location

The beekeeping project located in the Siberia-Ceibas Regional Natural Park, a natural reserve area, is delimited by the villages of Motilón, La Plata and San Miguel. The project has an operational headquarters provided by the CAM (Corporación Autónoma Regional del Alto Magdalena), located within the Natural Park area, fully equipped for both theoretical and practical beekeeping training.

This project can be environmentally viable if carefully planned and executed, considering potential impacts and adopting the necessary mitigation measures. It is essential to conduct a detailed environmental evaluation and involve experts in beekeeping and biodiversity conservation.

Image No 1. Project Location



Source: Google Maps 2025

The project will be carried out in the upper part of the Las Ceibas River basin, within the Siberia-Ceibas Regional Natural Park, located between the Motilón, La Plata and San Miguel rural areas. This region, characterized by its mountainous terrain and extensive cloud forests, is in a biodiversity-rich zone, offering ideal conditions for the development of sustainable beekeeping.

The project aims to impact 20 families in vulnerable situations, who face high levels of poverty and unemployment, prioritizing women heads of households and young people affected by violence, unemployment and lack of opportunities.

In conclusion, the environmental conditions of the Siberia-Ceibas Regional Natural Park provide a suitable environment for the development of the sustainable beekeeping project. However, careful planning and proper management are needed to ensure its long-term success and contribute to the conservation of this valuable ecosystem.

Implementing a beekeeping project in the Siberia-Ceibas Regional Natural Park represents a unique opportunity to combine biodiversity conservation with local economic development. The park's rich flora provides an ideal environment for high-quality honey production, while beekeeping activities contribute to pollination and ecosystem conservation. This project will generate additional income for local communities, strengthen social fabric and promote sustainable tourism. At the same time, it aligns with the park's conservation objectives and contributes to positioning Huila as a benchmark for high-quality beekeeping products.

5.5 PRODUCT IDENTIFICATION

Bee Honey in new 27-Kilogram Bucket, 2 ml thickness transparent plastic bag, plastic Seal, the buckets must be labeled with a sticker showing the supplier's name, product quantity, floral origin, city and collection date.

- ✓ Color: Ranges from light amber to dark amber.
- ✓ Taste: Mild and sweet, depending on the flowers from the collection area.
- ✓ Smell: Floral scent from the collection area.
- ✓ Consistency: Liquid, viscous.
- ✓ Appearance: Free from physical contamination (metals, nails, hair, insects).

Chart No 7. Product Technical Data

Features	Characteristic
Product Name	Bee Honey
Commercialization	Wholesale through commercial partner
Proposed business partner	<ul style="list-style-type: none"> ✓ Apiario el Pinar CIA LTDA Apelpinar LTDA ✓ Jardín de las Abejas S.A.S ✓ Tiendas Kahvé – Inversiones Coocentral ✓ Apilipona
Quality	Bee Honey
Sale Unit	Kilogram
Quality Conditions	<ul style="list-style-type: none"> • Color: Ranges from light amber to dark amber. • Taste: Mild and sweet, depending on the flowers from the collection area. • Smell: Floral scent from the collection area. • Consistency: Liquid, viscous. • Appearance: Free from physical contamination (metals, nails, hair, insects).
Delivery conditions	New 27-Kilogram Bucket, 2 ml thickness transparent plastic bag, plastic Seal, the buckets must be labeled with a sticker showing the supplier's name, product quantity, floral origin, city and collection date.
Packaging or Luggage.	New 27-Kilogram Bucket, 2 ml thickness transparent plastic bag, plastic Seal, the buckets must be labeled with a sticker showing the supplier's name, product quantity, floral origin, city and collection date.
Delivery Location	In the warehouse of the commercial partner
Place of Manufacture	Siberia-Ceibas Regional Natural Park, located between the villages of Motilón, La Plata and San Miguel.
organoleptic characteristics	<ul style="list-style-type: none"> • Color: Ranges from light amber to dark amber. • Taste: Mild and sweet, depending on the flowers from the collection area. • Smell: Floral scent from the collection area. • Consistency: Liquid, viscous. • Appearance: Free from physical contamination (metals, nails, hair, insects).

Source: Own source

5.5.1 Variety of Hive Products

The beekeeping industry offers a wide range of natural products, each with unique properties and benefits for the pharmaceutical, cosmetic and gastronomic industries. From the energizing honey to the powerful propolis, these treasures of nature are packed with essential nutrients that strengthen our bodies and provide us with vitality.

Pollen: Pollen is a fine, colored powder produced by flowering plants. Each pollen particle contains the male genetic material necessary for fertilization. These small particles are transported from one flower to another by various pollinators such as wind, water and insects, especially bees. Bee pollen is considered a superfood due to its rich nutritional composition. It contains a variety of essential nutrients for the human body, including:

- ✓ **Proteins:** Pollen is a complete source of protein, containing all the essential amino acids our bodies need.
- ✓ **Vitamins:** It is abundant in B-complex vitamins, as well as vitamins C, E, and K.
- ✓ **Minerals:** Pollen contains calcium, iron, potassium, magnesium, and other important minerals.
- ✓ **Enzymes:** It has enzymes that aid digestion and nutrient absorption.
- ✓ **Antioxidants:** Pollen helps protect cells from damage caused by free radicals.

Royal Jelly: This is a gelatinous, milky substance, whitish in color, produced by young worker bees. It is considered a true elixir of nature, as it is the exclusive food for the queen bee and larvae during their first days of life. Thanks to its consumption, the queen bee grows much larger than the workers and lives up to 40 times longer.

It contains: Vitamins (B, C, D, and E); Enzymes, lipoproteins, whole substances, hormones, bactericidal and bacteriostatic properties, manganese, mineral salts, calcium, sodium, phosphorus, potassium, chloride, magnesium, aluminum, iron, silicon, copper, cobalt, zinc, strontium, etc.

Beeswax: A natural substance produced by honeybees, it is a waxy material, ranging from pale yellow to golden in color, used by bees to build their honeycombs. These honeycombs are the home of the colony, where they store honey, pollen, and rear their young.

Propolis: A resinous substance, dark brown in color, sticky with a balsamic aroma, produced by bees from plant resins that they collect from trees and shoots.

Apitoxin (Bee Venom): This is the venom produced by worker bees as part of their defense mechanism. When they sting, they inject this bitter, slightly acidic liquid into the body of the aggressor. Although its primary function is to protect the hive, apitoxin has been studied for its potential therapeutic properties.

The Siberia Ceibas Project, known as the Honeycomb of Economic Development, aims primarily at the production and marketing of bee honey. It is anticipated that 70% of the sales will be made through wholesale marketing, thanks to a strategic partnership with a commercial partner, as indicated in the product's technical specifications. The remaining 30% of the honey will be packaged and distributed to health food stores and supermarkets, allowing effective reach of the regional market.

5.5.2 Marketing Analysis

Chart No 8. Market Analysis of Neiva City in Natural Stores for Honey

Store	Product	Brand	Packaging	Price COP	Supplier	Sanitary Certifications
TIENDA MATORISTA ENERGIA, SALUD Y VIDA	Honey Bee	Apiagro Honey with Pollen	Plastic bottle (liter an half)	\$25000 Bottle \$13.000 Half	Apicultores del Huila envasado "La Esperanza Apimiel"	Resolution 1057/2010 Modified registration Res. 2674
	Propolis	Bropomiel Bronquisan	Syrup-Glass bottle-240 ml	\$ 18.000	Laboratorio Biopronat Laboratorio el Mana	Invima Sanitary Registration 20210001601
CENTRO NATURISTA NATIVA JK	Propolis	Totumo and Ginger Syrup (el rey Cutervo).	Syrup- Plastic bottle -400, 350, 250 Gr	\$ 25.000 \$ 22.000 \$ 18.000	Laboratorio el Rey Cutero (Lima - Perú).	Invima Sanitary Registration 119725-98
		Propolis and Ginger (Natural Freshly).			Laboratorio Natural Freshly	Invima Sanitary Registration AD16M14495
		PROPOLIS (EUK LIP)			Laboratorio S.E.A Natural	Invima Sanitary Registration RSA-0022988-2022
CENTRO NATURISTA EL MARAÑON	Honey Bee	Apiaries "los Cambulos"	Glass blottle 350 ml	\$ 25.000	Jose Joaquin Suarez (santamaria-Huila)	Do not hold Invima Sanitary Registration. Only chamber of commerce certification.
	Propolis	Propolis - Honey	Syrup-Glass bottle--240 Gr	\$ 25.000	Laboratorio APIHUILA	Do not hold Sanitary Registration
Bronquisan Jelly el Mana		\$ 18.000		Laboratorio el MANA	Invima Sanitary Registration	

						PFM2010-0001610
CENTRO NATURISTA CASA NUEVA Y VIDA	Propolis	Propolis and Ginger (Natural Freshly)	Syrup- Plastic bottle -350 Gr.	\$ 25.000	Laboratorio Natural Freshly	Invima Sanitary Registration AD16M14495
		BQ nat	Syrup- Plastic bottle -240 ml	\$ 22.000	Laboratorio FUNAT S.A.S	Invima Sanitary Registration NSA-0010695-2021
CENTRO NATURISTA NATURAL STORE (Tienda Olimpica)	Pollen	FUNAT Natural source	Granulated-Glass blottle - 120 Gr	\$ 33.200	Laboratorio FUNAT S.A.S	This pollen product does not require a sanitary registration if it is marketed without undergoing any transformation process., cert N. 2013009083
	Propolis	BQ nat			Laboratorio FUNAT S.A.S	Invima Sanitary Registration 002535-2016
		Propolis and Ginger (Natural Freshly)	Jelly - Plastic bottle -200 ml	\$ 25.000		
Royal Jelly	Royal Jelly Mangosteen Natural Freshly	Jelly - Plastic bottle -300 Gr	\$ 36.000	Laboratorio Natural Freshly	Invima Sanitary Registration NSA-000527-2016	
TENDA NATURISTA POLEN Y MIEL	Pollen	Super extra fine pollen	Granulated-250 gr	\$ 28.000	ED Escallón Dominguez	Invima Sanitary Registration RSAD 16172212
	Propolis	Propolis, Honey Eucalyptus	Jelly - Plastic bottle -240Gr	\$ 12.000	Laboratorio APIHUILA S.A.S	Invima Sanitary Registration NSA-002373-2016
		Propolis Compound Honey	Jelly - Plastic bottle 240Gr	\$ 12.000	Laboratorio APIHUILA S.A.S	Invima Sanitary Registration NSA-002373-2016
		Bronquisan jaled el MAMA	Jelly - Plastic bottle -240Gr	\$ 15.000	Laboratorio el MANA	Invima Sanitary Registration PFT 2021-000160-81
CENTRO NATURISTA LA BOTICA DE LA ABUELA	Pollen	Polen D&C S.A.S	Granulated 250 Gr	\$ 18.000	Distri naturales DYC	Invima Sanitary Registration 2020009085
	Propolis	Propolis, Honey bee, Gynger	Jelly - Plastic bottle -350 Gr	\$ 25.000	Laboratorio Natural Freshly	Invima Sanitary Registration AD16M14495
	Royal Jelly	Royal Jelly Mangosteen natural Freshly	Jelly - Plastic bottle -300 Gr	\$ 40.000	Laboratorio Natural Freshly	Invima Sanitary Registration NSA-000527-2016
CENTRO NATURISTA CASA DE SALUD Y VIDA	Propolis	Natural Freshly	Jelly - Plastic bottle 350 Gr	\$ 25.000	Laboratorio Natural Freshly	Invima Sanitary Registration AD16M14495
		BQ NAT	Jelly - Plastic bottle -240ML Gr	\$ 22.000	Laboratorio FUNAT S.A.S	Invima Sanitary Registration NSA-0010695-2021
ENTRO NATURISTA LA ESPERANZA	Propolis	Compound Propolis	Jelly - Glass bottle -350 Gr	\$ 19.300	Laboratorio Almiel	Invima Sanitary Registration PSAD:13166201

Source: Own source 2025

The market study conducted in 9 natural stores in Neiva revealed a growing demand for bee products, especially royal jelly, despite its limited availability. The prices of the analyzed products fall within a medium-high range, with royal jelly being the most expensive product. The laboratories Natural Freshly, El Maná, APIHUILA and FUNAT dominate the market, offering quality products that meet consumer needs. However, the study indicates that there is an opportunity to expand the market for bee products in Neiva, especially if marketing strategies are implemented and differentiated products are offered.

6. ORGANIZATIONAL COMPONENT

6.1 Name or Legal Entity

The creation of a non-profit, civil association is proposed, with the main objective of promoting the sustainable development of the beekeeping sector in the region. This association, open to all interested individuals, will aim to improve the living and working conditions of its members, as well as establish strategic alliances with public entities, private organizations and international bodies to promote beekeeping both nationally and internationally.

The name or legal entity will be: Association of Beekeeping Producers of the Siberia Ceibas Regional Natural Park and the trade name will be ApiCeibas.

6.2 Corporate Identity

Image No 2 Beekeeping Company Logo



**ASOCIACIÓN DE PRODUCTORES APÍCOLAS
PARQUE NATURAL REGIONAL SIBERIA CEIBAS.**

Source: Own source 2025

6.3 Mission:

To promote sustainable development and social inclusion through beekeeping, improving the economic opportunities of 20 vulnerable families in the Siberia-Ceibas Regional Natural Park, prioritizing female heads of household, youth and contributing to environmental conservation.

6.4 Vision:

To be a model of sustainable and socially inclusive beekeeping in Colombia, creating employment and development opportunities for rural communities, while conserving biodiversity and promoting respect for natural resources.

6.5 Corporate Values:

- ✓ **Sustainability:** Commitment to environmental conservation and the responsible exploitation of natural resources.
- ✓ **Social Inclusion:** Prioritize the well-being of female heads of household, vulnerable youth and local communities.
- ✓ **Responsibility:** Act with ethics, respect and transparency in all relationships and processes of the project.
- ✓ **Teamwork:** Effective collaboration among all project stakeholders, including beneficiaries, strategic partners and local authorities.
- ✓ **Innovation:** Constant search for new technological solutions and methods to optimize beekeeping and the commercialization of products.
- ✓ **Commitment to Quality:** Ensure high-quality products that meet national and international standards.

6.6 Organizational Structure:

The organizational structure for the beekeepers' association, such as the Association of Beekeeping Producers of the Siberia Ceibas Regional Natural Park, can be designed to promote collaboration, efficiency and sustainability. This is a proposed organizational structure for the association:

General Assembly: Composed of all members (20 families). This is the highest decision-making body of the organization.

Functions:

- ✓ Approve projects and activities.
- ✓ Make strategic decisions.
- ✓ Elect members of the Board of Directors.

Board of Directors: Elected by the General Assembly, composed of a smaller group of members (e.g., 5 to 7 people).

Functions:

- ✓ Supervise the implementation of projects.
- ✓ Make operational decisions.
- ✓ Act as a link between the General Assembly and working groups.

Board Roles:

- ✓ **President:** Leads and represents the organization.
- ✓ **Vice President:** Supports the president and assumes their duties in their absence.
- ✓ **Secretary:** Responsible for documentation and minutes.
- ✓ **Treasurer:** Manages finances and accounting.
- ✓ **Board Members:** Represent specific interests and assist in management.

Working Committees: Groups formed by members to address specific areas of the project. Each committee may have a coordinator.

Proposed Committees:

- ✓ **Technical Committee:** Responsible for training and technical advice on beekeeping (colony management, health, production).
- ✓ **Commercialization Committee:** Focuses on the sale of beekeeping products (honey, wax, etc.) and market research.
- ✓ **Training Committee:** Organizes workshops and training sessions for members.
- ✓ **Sustainability Committee:** Focuses on sustainable environmental practices and resource conservation.

Producing Families: Each beneficiary family is an active member of the organization and has specific roles in beekeeping production.

Functions:

- ✓ Manage beehives.
- ✓ Participate in training sessions.
- ✓ Collaborate on group activities.
- ✓ Participate in decision-making through the General Assembly.

This organizational structure is flexible and can be adapted based on the specific needs and characteristics of the community and the project. Active participation from all members is key to the success of the beekeeping project.

Image No 3 Organizational Structure



Source: Own source 2025

7. TECHNICAL COMPONENT

Honey collection can be done from both natural and artificial hives, with the latter being managed by beekeepers. This document will focus on honey production from artificial hives. It is important to understand that honey production is a seasonal process, influenced by climatic and floral factors in each region. According to data from the Beekeeping and Honey Chain (CPAA), the average yield per hive is between 29 and 31 kilograms, which is considered optimal for beekeeping profitability. Post-harvest processes, such as extraction and packaging, are carried out in extraction rooms equipped with specific tools and machinery.

7.1 Proposed Technological Package.

Chart No 9 Proposed Technical Activities

Proposed Activities	Proposed Technological Package	Justification
PLANTING		
Selection of areas and apiary setup	The technical assistant and the producer will select the designated areas that have sufficient vegetation cover with pollinator-friendly flora, located in flat areas or with minimal slopes, away from any human activities (agricultural, industrial, etc.). Additionally, access roads, clean water sources, environmental and climatic conditions (winds and humidity) should be considered. The areas must be quiet, free of noise, unpleasant odors, human or animal traffic and free from the risks of flooding or landslides. The presence of nearby apiaries should also be considered to avoid overcrowding the area.	It allows a more efficient implementation of the proposed technological model, leading to an increase in honey production
Preparation, selection and acquisition of materials, items and beekeeping equipment.	It is recommended to acquire hives made from materials that can withstand exposure to the elements, personal protective equipment, beekeeping tools (smoker, hive tool, and brush) and extraction equipment (its use should be planned to optimize harvest time). The placement and distribution of the hives should, if possible, be oriented with the entrance facing away from the wind, facing towards the sunrise. It is recommended that each hive be installed on individual supports or bases, either asymmetrically or uniformly, with a prudent distance between them (between 1 and 3 meters). It is advisable to mark the hive locations. For bee selection, it should be ensured that the queen is young, marked with the color of the year and no older than 3 months, considering a 25% replacement rate.	It is necessary to have the required equipment for the installation and management of the hives as well as clear criteria for bee selection as this directly influences in honey production.
Installation of nuclei	It is recommended that each bee nucleus be installed in a separate hive, in its respective brood chamber. As the colony grows in population, it is advised to place wax foundation frames in the brood chambers to encourage the queen's egg-laying. Similarly, it is recommended to periodically provide syrup (2:1) or pollen cakes until the hive develops a stronger colony.	Avoid bee overcrowding and define strategies that allow for increased productivity as the bee colony develops.
MAINTENANCE		
Apiary Management	It is recommended that the inspection be done during the bees' peak activity hours (from 10 am to 3 pm) and on days with high atmospheric pressure or sunny weather. Due to the decrease in efficiency of queen bees because of high egg-laying rates, it is recommended to replace them periodically (every year) to avoid deteriorating the productive characteristics of the colony. A queen replacement is also done when it is desired to lower the defense level of the colony by introducing a new queen with genetic traits of gentleness and a tendency toward honey production. It is recommended that during periods of food scarcity, external feeding be used to complement or replace nectar or pollen in the colony. This practice should only be done to feed the bees and is not recommended for harvesting honey during these periods as the quality of the honey may vary or decrease.	Evaluate the development of each colony and analyze the different problems that may be occurring and significantly affect the production and health of the hive. Increase the production and quality of the product.
Record and Monitoring	It is recommended to maintain a record for each hive. Therefore, it is necessary to identify the most productive hives in order to determine the individual conditions to be applied to the others. Keep a record of the different flowering periods as well as of each species of apicultural flora. It is recommended to assess the apiary's performance during various production periods. It is essential to maintain production records which are used to compare production levels between different periods.	Refine or improve the beekeeping and management techniques implemented
Sanitary Control	Pest Control: Identification, precautions to avoid contaminating the products inside the hive and monitoring the effectiveness of biological control systems. Disease Control: A more stringent sanitary procedure given the risk of infection among bees, either from brood diseases or diseases of adult bees. Special care is recommended for both conventional and biological control systems.	Decrease in bee mortality and increase in product production and quality.

	Poisoning Control: Precautions should be taken regarding the emission or presence of contaminant gases, the use of agrochemicals in agricultural activities, water contamination or direct or indirect contact with certain chemicals or toxins as these affect bee health.	
Apiary Maintenance	Hive Inspection: It is recommended to paint or waterproof the wood to prolong its useful life using natural vegetable oils, paraffin or wax for the process. Maintenance of Access Paths to the Apiary: Signage for the apiary and pedestrians as well as the facilities for extraction or processing. Since the apiary is located amid forests, grasslands, pastures, etc., it is recommended to frequently control the growth of vegetation inside. Preventive pruning of trees, especially their larger branches, should be done. It is recommended that the grass cutting be done manually.	Increase the lifespan of the items used, increase the amount of food available in the area, and prevent the spread of wild bee swarms
Complementary activities	It is recommended to carry out reforestation and revegetation of native apicultural flora species. Capture wild or freebee swarms that may be found in or around the apiary. For this, swarm-catching hives or nucleus boxes should be used. If there are no nearby clean water sources near the apiary or if the apiary is located in warm regions, it is necessary to install communal water troughs for the apiary or individual water feeders for each hive. It is not recommended to place apiaries near ponds, wells or wetland, as stagnant water can cause sanitary issues. It is recommended that every beekeeper have a first aid kit with medications to counteract the allergic effects and symptoms of bee venom in case of stings. For this, they should consult trained personnel in pharmacy or medicine	Increase the amount of food available in the area and boost production levels
HARVEST AND BENEFITS		
Product extraction	It is recommended to extract honey manually by removing the frames with capped honey. The selected frames are placed in an empty super, depending on the frame size, to be transported within the hive box with greater protection and comfort. It is recommended to extract the wax from frames with old, uncapped or damaged combs due to centrifugation as well as from the cappings produced when extracting the honey, which is replaced with new sheets of stamped wax. The solar wax melter should be used for its processing.	Greater product extraction, better practices and efficiency in the process, which is reflected in an increase in production and product quality.

SOURCE: Ministry of Agriculture and Rural Development: Model of Productive Alliances.

Chart No 10. Genetic Plant Material

Biological Material	Description
Plant or Genetic Material to Be Used	Young Queen and Broodstock (<i>Apis Mellifera</i>)
Seed Type	Marked with the color of the year, no more than 3 months old with a 2% to 5% replacement rate.
Price Conditions	A batch of three live mated and marked Italian queen bees, 2025..
Form and Delivery Location	The supplier will deliver the bees to the production sites of each producer.
Origin of Plant or Genetic Material	The biological material comes from apiaries whose agro-environmental conditions are similar to those of the project's area.
Variety or Breed Adaptability in the Region	The material is very well adapted to the region's conditions.
Availability of Material from the Supplier	Programmed upon request.
Preparation Waiting Time	Two months from the negotiation.
Additional Requirements or Procedures	Legally constituted supplier with ICA certification
Supplier Requirements	Schedule delivery and transportation with the technicians' area and producers. Define the delivery protocol and satisfaction receipt by the producers' organization.

Source: Beekeeping Environmental Guide

7.2 Honey Collection Process

7.2.1 Collection of Hive Frames:

Honey harvesting begins with a detailed inspection of the hive frames. The beekeeper evaluates the maturity level of each comb, paying particular attention to the percentage of cells sealed with wax (capped). This evaluation, along with the beekeeper's experience and knowledge of the season, helps to determine the ideal time to extract the honey. Extracting frames with honey requires great care due to the presence of bees. Therefore, beekeepers must follow strict safety and hygiene guidelines:

- ✓ Keep nails trimmed and without polish
- ✓ Bathe before visiting the hive
- ✓ Do not use perfumes or lotions
- ✓ Avoid visiting the hive when intoxicated or hangover
- ✓ Wear protective clothing (safety equipment)
- ✓ Do not eat near the hive
- ✓ Avoid coughing or sneezing around the hives
- ✓ Ensure identified escape routes in case of emergency
- ✓ Have a first aid kit available

7.2.2 Uncapping:

Uncapping is a crucial stage in honey extraction. It involves removing the wax layer that the bees use to seal the honey-filled cells (cappings). To perform this process, an electric knife is used and its temperature should not exceed 60°C as excessive heat could alter the organoleptic and chemical characteristics of the honey. Once uncapped, the frames are placed in the extractor to centrifuge the honey.

7.2.3 Centrifuge:

To begin the extraction process, the uncapped frames are orderly placed into the centrifuge basket, filling it to capacity. The centrifuge mechanism is then started, gradually increasing the rotation speed. The centrifugal force expels the honey from the frames, depositing it at the bottom of the centrifuge, where it can easily be extracted through a valve.

7.3 Machinery and Production Equipment

Langstroth Hive

The basic requirements for honey production include physical elements such as boxes, supers and excluders which form the hive's structure. However, beekeeping success also depends on external factors such as the availability of floral resources, the presence of a water source and the climatic conditions of the area. The Langstroth hive, thanks to its modular and adaptable design, has become the most common choice for beekeepers as it allows adjustment of the hive size according to the colony's needs and available resources.

Protective Equipment

The *Apis mellifera* Africanized bee or Africanized honeybee, is the most common species in our territory and is known for its defensive behavior. Due to this characteristic, it is essential for beekeepers to wear full protective gear when performing any task inside the hive. This equipment typically includes a veil to protect the head and face, a durable coverall to protect the body, leather gloves for hand protection and boots to protect the feet.





Additional Tools

Beekeeping equipment is complemented by specific tools for managing hives. These include a soft-bristled brush, uncapping knife, hive tool and smoker. The brush is used for cleaning the frames, the uncapping knife for removing the cappings, the hive tool for handling hive elements, and the smoker for controlling the bees' behavior by producing cold smoke.

Centrifuge

When the frames are filled with honey and sealed with wax, they are removed from the hive and placed in a honey extractor, preferably made of stainless steel. This material is ideal for this type of equipment because it prevents oxidation and contamination of the honey and it also facilitates cleaning and disinfection. Through the centrifugation process, the honey is separated from the wax and collected in a container.

Chart No 11. Beekeeper's Production Equipment

✓ Langstroth Hives	
✓ Protective Equipment	
✓ Additional Tools	
✓ Centrifuge	

Source: Beekeeping Environmental Guide

7.4 Fertilization Plan

Between May and August, coinciding with the rainy season and low flowering periods, the bees will require supplementary feeding. For this, a sugar syrup with a 66% concentration (2 parts sugar to 1 part water) will be prepared which will be provided to the colonies every 15 days. This measure will ensure that the bees have the necessary nutrients during these periods of scarcity. The food will be introduced into the colony.

7.5 Integrated Pest and Disease Management Plan – IPDM

To prevent and control pests and diseases without resorting to chemical products, a genetic selection program will be implemented. Queens will be selected that pass on to their daughters the ability to groom themselves efficiently, a key behavior for detecting and eliminating parasites like varroa. Additionally, management practices will be implemented to promote colony health such as periodic queen replacement and ensuring good brood rearing. It is important to note that the bees' innate defensive behavior serves as a natural barrier against various threats, including ants.

8. FINANCIAL COMPONENT

It is considered one of the most important aspects when investing in a productive project and it mainly focuses on financial indicators such as the Internal Rate of Return (IRR), the Opportunity Cost Rate (OCR) and the Net Present Value (NPV) to determine whether the project is financially viable or not. To calculate these indicators, the cash flow becomes the primary tool that shows the project's liquidity resulting from cash inflows and outflows over a specific period, which, in our case, is projected for 12 months, 5 years and 10 years.

Thus, the identification and cost allocation of the necessary elements, as outlined in the Business Plan for the installation and operation of 20 apiaries, each with 20 hives, are established. These are detailed below.

ACTIVITIES	UNIT
WORKFORCE	
PLANTING	
Apiary adjustments	Day Labor
Installation of hives and nuclei	Day Labor
MAINTENANCE	
Hive inspection	Day Labor
Apiary maintenacen	Day Labor
HARVESTING	
Honey ectraction	Day Labor
ADMINISTRATIVE	
Manager	
Accountant	

ACTIVITIES	UNIT
SUPPLIES	
PLANTING	
Four-frame nucs with a mated queen	Unit
Sugar for hive feeding	Kilo
Stamped wax sheet	Unit
Queens	Unit
Langstroth hive and internal feeder	Unit

ACTIVITIES	UNIT
PUBLIC SERVICES AND RENT	
Technical assistance	Month
Soil Analysis	Units
Land Lease	Month
Transportation of supplies and seeds	Ton
Public Services	Month

ACTIVIDADES	UNIDAD
OTRAS INVERSIONES	
Equipos y Herramientas	
Palanca estándar en acero inoxidable	Unidad
Cepillo mann lake	Unidad
Guantes en cuero con mangas de tela	Unidad
Overol en dril súper 8	Unidad
Ahumador	Unidad
Excluidor de reinas en plastico	Unidad
Tenedor desoperculador	Unidad
Filtro doble en acero inoxidable	Unidad
Inversiones	
Centrifuga en acero inoxidable 3 cuadros	Unidad
Cerificador	Unidad
Medidas de adaptación al cambio climático	0
Medidas de adaptación al cambio climático	Global
Mantenimiento Infraestructura	
Mantenimiento general apiario	Global

Similarly, the projected sales of honey are 16,000 kg per year at COP 15,000 per kg, coming from the 400 hives with two harvests per year. The quantities will be adjusted with an increase based on the average calculated CPI of 6.962.

AMOUNT/VALUES	1	2	3	4	5	6	7	8	9	10
Amount of honey produced over 5 years	16000.00	16000.00	16000.00	16000.00	16000.00	16000.00	16000.00	16000.00	16000.00	16000.00
Values of honey produced over 5 years	\$ 240,000,000.00	\$256,708,800.00	\$ 273,417,600.00	\$ 290,126,400.00	\$ 306,835,200.00	\$ 323,544,000.00	\$ 340,252,800.00	\$ 356,961,600.00	\$ 373,670,400.00	\$ 390,379,200.00

Projected Cash Flow for 1 Year:

EGRESOS	Meses del año												
	0	1	2	3	4	5	6	7	8	9	10	11	12
FORMALIZACIÓN	17.000.000	-	-	-	-	-	-	-	-	-	-	-	-
Formalización Empresarial - CCH	2.000.000												
Plan de negocios	5.000.000												
Permisos	10.000.000												
MANO DE OBRA	3.796.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	4.398.000	3.449.000	3.449.000	3.449.000	4.398.000
Mano de obra	3.796.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	3.449.000	4.398.000	3.449.000	3.449.000	3.449.000	4.398.000
INSUMOS	181.066.000	1.920.000	1.920.000	1.920.000	-	-	-	-	-	-	1.920.000	1.920.000	11.920.000
Insumos	181.066.000	1.920.000	1.920.000	1.920.000	-	-	-	-	-	-	1.920.000	1.920.000	11.920.000
OTRAS INVERSIONES	57.380.000	-	-	-	-	-	-	-	-	-	-	-	949.000
Otras Inversiones	57.380.000	-	-	-	-	-	-	-	-	-	-	-	949.000
SERVICIOS PÚBLICOS	2.000.000	6.280.000	6.080.000	6.080.000	6.080.000	6.080.000	6.080.000	6.080.000	6.280.000	6.080.000	6.080.000	6.080.000	6.280.000
Servicios Públicos	2.000.000	6.280.000	6.080.000	6.080.000	6.080.000	6.080.000	6.080.000	6.080.000	6.280.000	6.080.000	6.080.000	6.080.000	6.280.000
TOTAL EGRESOS	261.242.000	11.649.000	11.449.000	11.449.000	9.529.000	9.529.000	9.529.000	9.529.000	10.678.000	9.529.000	11.449.000	11.449.000	23.547.000

INGRESOS	Meses del año												
	0	1	2	3	4	5	6	7	8	9	10	11	12
VENTA													
Venta miel		-	-	-	-	-	-	-	120.000.000	-	-	-	120.000.000
TOTAL INGRESOS		-	-	-	-	-	-	-	120.000.000	-	-	-	120.000.000
DIFERENCIA	-261.242.000	-11.649.000	-11.449.000	-11.449.000	-9.529.000	-9.529.000	-9.529.000	-9.529.000	109.322.000	-9.529.000	-11.449.000	-11.449.000	96.453.000

IRR	-7%
OCR	12%
VNA	\$ -409.442.603,00

The projected cash flow for one year shows an IRR of -7% and a negative NPV, therefore the project is not financially viable.

Projected Cash Flow for 5 Years:

EGRESOS	Años					
	0	1	2	3	4	5
FORMALIZACIÓN	17.000.000	-	-	-	-	-
Formalización Empresarial - CCH	2.000.000					
Plan de Negocios	5.000.000					
Permisos	10.000.000					
MANO DE OBRA	3.796.000	43.286.000	46.299.571	49.313.143	52.326.714	55.340.285
Mano de obra	3.796.000	43.286.000	46.299.571	49.313.143	52.326.714	55.340.285
INSUMOS	181.066.000	21.520.000	23.018.222	60.972.125	26.014.667	27.512.890
Insumos	181.066.000	21.520.000	23.018.222	60.972.125	26.014.667	27.512.890
OTRAS INVERSIONES	57.380.000	949.000	1.015.069	1.081.139	1.147.208	1.213.278
Otras Inversiones	57.380.000	949.000	1.015.069	1.081.139	1.147.208	1.213.278
SERVICIOS PÚBLICOS	2.000.000	73.560.000	78.683.130	83.802.494	88.923.742	94.044.989
Servicios Públicos	2.000.000	73.560.000	78.683.130	83.802.494	88.923.742	94.044.989
TOTAL EGRESOS	261.242.000	139.315.000	149.015.993	195.168.901	168.412.331	178.111.441

INGRESOS	Años					
	0	1	2	3	4	5
VENTA						
Venta miel		240.000.000	256.708.800	273.417.600	290.126.400	306.835.200
TOTAL INGRESOS	-	240.000.000	256.708.800	273.417.600	290.126.400	306.835.200
DIFERENCIA	- 261.242.000	100.685.000	107.692.807	78.248.699	121.714.069	128.723.759

IRR	29%
OCR	12%
VNA	\$ 203.517.188,00

The projected cash flow for 5 years shows an IRR of 29% and a positive NPV, therefore the project is financially viable.

Projected Cash Flow for 10 Years:

EGRESOS	Años										
	0	1	2	3	4	5	6	7	8	9	10
FORMALIZACIÓN	17.000.000	-	-	-	-	-	-	-	-	-	-
Formalización Empresarial - CCH	2.000.000										
Plan de Negocios	5.000.000										
Permisos	10.000.000										
MANO DE OBRA	3.796.000	43.286.000	46.299.571	49.313.143	52.326.714	55.340.285	58.353.857	61.367.428	64.380.999	67.394.571	70.408.142
Mano de obra	3.796.000	43.286.000	46.299.571	49.313.143	52.326.714	55.340.285	58.353.857	61.367.428	64.380.999	67.394.571	70.408.142
INSUMOS	181.066.000	21.520.000	23.018.222	60.972.125	26.014.667	27.512.890	72.150.312	30.509.334	32.007.557	83.328.499	35.004.002
Insumos	181.066.000	21.520.000	23.018.222	60.972.125	26.014.667	27.512.890	72.150.312	30.509.334	32.007.557	83.328.499	35.004.002
OTRAS INVERSIONES	57.380.000	949.000	1.015.069	1.081.139	1.147.208	1.213.278	1.279.347	1.345.416	1.411.486	1.477.555	1.543.624
Otras Inversiones	57.380.000	949.000	1.015.069	1.081.139	1.147.208	1.213.278	1.279.347	1.345.416	1.411.486	1.477.555	1.543.624
SERVICIOS PÚBLICOS	2.000.000	73.560.000	78.683.130	83.802.494	88.923.742	94.044.989	99.166.236	104.287.483	109.408.730	114.529.978	119.651.225
Servicios Públicos	2.000.000	73.560.000	78.683.130	83.802.494	88.923.742	94.044.989	99.166.236	104.287.483	109.408.730	114.529.978	119.651.225
TOTAL EGRESOS	261.242.000	139.315.000	149.015.993	195.168.901	168.412.331	178.111.441	230.949.752	197.509.662	207.208.772	266.730.602	226.606.993

INGRESOS	Años										
	0	1	2	3	4	5	6	7	8	9	10
VENTA											
Venta miel		240.000.000	256.708.800	273.417.600	290.126.400	306.835.200	323.544.000	340.252.800	356.961.600	373.670.400	390.379.200
TOTAL INGRESOS	-	240.000.000	256.708.800	273.417.600	290.126.400	306.835.200	323.544.000	340.252.800	356.961.600	373.670.400	390.379.200
DIFERENCIA	-261.242.000	100.685.000	107.692.807	78.248.699	121.714.069	128.723.759	92.594.249	142.743.138	149.752.828	106.939.798	163.772.207

IRR	39%
OCR	12%
VNA	\$ 254.507.485,00

The projected cash flow for 10 years shows an IRR of 39% and a positive NPV, therefore the project is financially viable.

It is important to mention that productive projects may take one year or more to become financially viable; the key point is that in the 5-year projection, the indicators show financial viability, meaning the project with the estimated variables in the spreadsheet is financially viable.

9. PROJECT RISKS

9.1 Social Risks:

Inequality in project benefits: Although the project primarily aims to benefit women heads of household and young people, there could be an unequal distribution of benefits, which may lead to tensions within the community, especially if not all beneficiaries receive the same training or resources.

Cultural resistance and lack of acceptance: Some people in the community may be reluctant to adopt new beekeeping techniques, especially if they are unfamiliar with these practices. Additionally, changes in traditional gender roles could generate resistance in some sectors of the community.

Challenges in training and learning: If beneficiaries fail to understand or properly apply the techniques learned during the 280-hour SENA training, the project could fail. The success of the project largely depends on the participants' ability to apply what they have learned.

Internal conflicts over project management: During the training and formation of associations, conflicts may arise concerning project management, task distribution or decision-making which could affect the effectiveness of teamwork.

9.2 Technical Risks:

Experience in honey production through associations: The beekeepers' association of the Siberia-Ceibas Regional Natural Park, has limited experience in honey production and marketing through an association model, as it is a new organization. This presents a risk of not meeting the production and quality targets. However, with the implementation of the technological package and technical assistance, it is expected that these impacts will be mitigated.

Transportation of materials and supplies: The winter road conditions, the distance from the farms to the urban center of Neiva and their geographical dispersion represent a significant risk for production. These factors may hinder the timely supply of materials and biological material transportation which could result in losses. To mitigate this risk, a work and logistics plan will be implemented to schedule purchases and ensure the availability of necessary resources.

Limited availability of professional experts in cultivation and the process: There is a risk in finding an agronomist and an environmental engineer with expertise in the cultivation process and in the regulations governing the entire production process. This risk can be mitigated by implementing an extensive recruitment campaign and applying a suitable selection process for the professionals who will handle all technical assistance activities.

Inadequate coordination of the project's various components: When the technical, social, financial, environmental, and market components of the project are not planned and executed in an integrated manner, there is a risk of dispersed and ineffective implementation. The lack of coordination between these components could generate confusion and mistrust among the producers, making it harder to adopt the project's recommendations. To avoid such situations, clear leadership is required to ensure all aspects of the project are coherently articulated.

9.3 Market Risks:

Local Market: Concentrating sales in the local market, although historically common, presents risks related to price volatility and dependency on a single marketing channel. To mitigate these risks, it is proposed to establish a marketing scheme combining formal sales channels with local market sales. It is recommended that at least 70% of the production be sold through a fixed commercial partner, ensuring stable demand and more predictable prices. The remaining 30% can be sold in the local market, provided this is coordinated with the producer organization.

Market behavior: The producer association lacks a contingency plan for managing risks related to price volatility such as oversupply caused by external or internal factors. To mitigate this risk, a price stabilization mechanism is proposed by negotiating commercial agreements with a minimum guaranteed price. This mechanism will help to protect producers' incomes and ensure the sustainability of production.

Fluctuations in honey prices: Honey prices may experience significant variations due to factors such as supply and demand, changes in consumer preferences, the emergence of substitutes, climatic conditions affecting production and government policies related to trade and taxes.

Competition from substitute products and adulterated honeys: Honey may face competition from artificial sweeteners and products that mimic its properties, which could erode its market share. Additionally, the presence of adulterated honeys in the market may damage the product's reputation and harm the credibility of honest producers.

Changes in consumer preferences: Consumers may change their consumption habits and prefer other products, affecting honey demand. Moreover, trends toward healthier diets or dietary restrictions could influence consumer choices.

9.4 Environmental Risks:

Alteration of the natural park ecosystem: While beekeeping can be beneficial for the ecosystem, if not managed properly, it could have negative effects on the natural park, such as altering local flora or fauna or introducing non-native bee species.

Irresponsible use of chemicals: Phytosanitary control is necessary to maintain bee health and prevent diseases, but improper use of chemicals could affect local biodiversity, including plants, other insects and animals in the natural park.

Climate impact: Climate change and seasonal variations can influence beekeeping production. Extreme weather conditions (droughts, frosts, heavy rains) can affect the flowering of plants that bees need to produce honey, reducing the project's productivity.

Failure to comply with environmental regulations: There is a risk that some producers might take actions that could have negative impacts on the environment, resulting in sanctions. This risk will be mitigated through awareness-raising activities in the Environmental Management Plan, which aims to guide activities so that they generate the least possible impact and comply with established regulations regarding the use of natural resources.

9.5 Economic Risks

Long-term financial viability of the project: Although initial training and technical support will continue, beneficiaries may face economic difficulties if they do not manage to generate stable income from honey and its derived products, especially in the early years before the project becomes self-sustaining.

Dependence on initial subsidies: If the project relies heavily on the initial subsidy for apiary installation and equipment purchases, there is a risk that, once this funding is depleted, beneficiaries will lack the resources to maintain apiary operations.

10. LEGAL FRAMEWORK

- ✓ **Political Constitution of Colombia of 1991:** Through Articles 28, 58, 64, 65, 333, and 334, it promotes the right to organization and the economic and social development of communities.
- ✓ **Law 2193 of 2022** "Through which mechanisms are created for the promotion and development of beekeeping in Colombia and other provisions are enacted." The law establishes mechanisms for the sustainable development of beekeeping, including the creation of public policies, financing programs for beekeepers and the promotion of research in the sector.
- ✓ **Resolution 206 of 2022 from the Ministry of Agriculture and Rural Development** "Manual of Animal Welfare Conditions in the breeding of bees (*Apis mellifera*) in the agricultural sector." It establishes guidelines to ensure the welfare of bees in beekeeping practices.
- ✓ **Resolution 448 of 2016 from the Colombian Agricultural Institute (ICA)** "Through which the requirements for the registration of premises of fresh vegetable products for export, exporters' registration, and packing plants for fresh vegetable export are established." It sets the control for mandatory beekeeping disease declarations.
- ✓ **Resolution 1057 of 2010 from the Ministry of Social Protection:** Establishes the technical regulation on the sanitary requirements that honey must meet for human consumption. It defines quality parameters, labeling, and storage conditions to ensure the product's safety.
- ✓ **Apicultural Health Program of the ICA:** The Colombian Agricultural Institute (ICA) has developed a health program to identify and control mandatory diseases affecting bees (*Apis mellifera*), such as American Foulbrood and European Foulbrood. This program aims to maintain the health of the hives and the quality of apiculture products.
- ✓ **INVIMA Sanitary Registration:** Honey without transformation, according to Article 37 of Resolution 2674 of 2013. Honey that has not undergone any transformation processes is exempt from obtaining commercialization authorizations, including the INVIMA sanitary registration.
- ✓ **INVIMA Sanitary Registration:** Derived honey products. If honey is used as an ingredient in processed products, such as confections, beverages, or cosmetics, these products require obtaining the INVIMA sanitary registration before commercialization.
- ✓ **Food Risk Classification** - Resolution 719 of 2015: Classifies food for human consumption based on its risk to public health. This classification determines the type of sanitary authorization required for each product.

In Colombia, certain provisions of the Colombian Agricultural Institute (ICA) must be complied with for the production of honey and its derived products such as pollen, propolis and royal jelly among others. Below are the details regarding the ICA's regulations and requirements:

1. **Beekeepers Registration:**
ICA requires that beekeepers, especially those engaged in commercial activities, register in the Apiculture Health Program. This program ensures the health of bees and the quality of apiculture products.

Basic requirements:

- Registration of the beekeeping operation with the ICA.
- Identification and georeferencing of the apiary.
- Certification of sanitary practices and proper hive management.

2. Beekeeping Premises Registration:

All premises dedicated to beekeeping must be registered with the ICA according to beekeeping health regulations. This includes:

- Sanitary control of hives to prevent diseases like American Foulbrood, Varroa among others.
- Traceability in the production of honey and its derivatives.

3. Marketing of Apiculture Derivatives:

ICA regulates the use of veterinary medicines, nutritional supplements and other inputs used in beekeeping production to ensure that the derived products are safe for human consumption.

4. Control of Inputs and Products:

To market derived products like pollen, propolis or royal jelly, it is necessary to ensure:

- Compliance with Good Beekeeping Practices (BPA).
- Traceability of products from the apiary to the final consumer.

To export honey and its by-products from Colombia, it is essential to comply with a series of regulations and requirements set by various governmental entities. The following are the main aspects to consider:

1. Registration and Sanitary Compliance:

- **Registration with the ICA:** The Colombian Agricultural Institute (ICA) requires beekeepers to register in the Apiculture Health Program. This registration is essential to guarantee the health of hives and the quality of apiculture products.
- **Good Beekeeping Practices (BPA):** It is mandatory to implement BPAs, which cover everything from proper hive management to the extraction and storage of honey and its derivatives. Compliance with these practices is essential to ensure the safety and quality of products intended for export.

2. Sanitary Requirements for Honey:

- **Resolution 1057 of 2010:** This resolution establishes the technical regulations regarding the sanitary requirements that honey must meet for human consumption. It includes physicochemical and microbiological parameters that must be followed to ensure the product's quality.

3. Labeling and Packaging:

- **Labeling Standards:** Honey packaging and labels must comply with the provisions established in Resolution 5109 of 2005 from the Ministry of Health and Social Protection. Specifically, the following must be included:

- ✓ The term "honey" should only be used for producers who comply with the legal provisions.
- ✓ The scientific name of the bee species (*Apis mellifera*) must be indicated.
- ✓ Include the label "Not recommended for children under one (1) year of age."
- ✓ For imported products, mention the country of origin or where the honey was collected.

4. **Export Requirements:**

- **Sanitary Certifications:** Depending on the destination country, specific sanitary certifications may be required. It is advisable to consult with ICA and INVIMA for detailed information on the necessary certifications.
- **International Standards:** It is crucial to ensure that honey and its by-products meet the standards of the importing country, including pesticide residue limits, quality standards and other specific requirements.

5. **Law 2193 of 2022:**

This law aims to promote and protect beekeeping in Colombia. Among its provisions, it promotes the export of apiculture products and by-products and establishes the need to regulate the quality requirements that must be met for export.

Additional Recommendations:

- **Specialized Advice:** Given that requirements may vary by destination country, it is advisable to seek advice from entities such as ProColombia or local Chambers of Commerce that can provide guidance on international markets and specific requirements.
- **Constant Updates:** Regulations may change, so it is essential to stay updated by regularly consulting the official publications from ICA, INVIMA and other relevant entities.
- **Compliance:** Adhering to these regulations and requirements is critical for the success of honey exports and its by-products, ensuring product quality and safety in international markets (once the associational group is ready).

ANNEXES

- Business Model Canvas
- Financial Template