Export Strategy for Colombian Specialty Coffee:

Logistics, Big Data, and Financial Viability

Dayana Vanesa Mendez Cortes

Presented to:

Carlos Humberto Gualdron Garcia

National Open and Distance University-(UNAD)

Deep-Depth Diploma: Logistics and Big Data

2026

Abstract

This report presents the design of a logistics and financial strategy for the Colombian micro, small, and medium-sized enterprise Café Andino S.A.S., focused on exporting premium roasted coffee to the United States. The study integrates national and international supply chain planning, Big Data-supported decision-making, and a five-year financial projection including income statement, cash flow, balance sheet, and Internal Rate of Return (IRR). The results show that a well-structured logistics system combined with data analysis improves operational efficiency, reduces costs, and strengthens competitiveness in international markets. Financial projections indicate sustained revenue growth, positive cash flows, and an IRR above the minimum acceptable rate of return, confirming the economic feasibility of the export project. Overall, the study demonstrates how MSMEs can integrate logistics management, financial planning, and data analytics to support successful international expansion.

***Keywords*:** logistics, supply chain, Big Data, coffee export, financial projection

Table of Contents

List of Tables

Introduction

In an increasingly globalized environment, micro, small, and medium-sized enterprises (MSMEs) must combine logistics planning, data-driven decision-making, and financial forecasting to remain competitive. As Harper (2026) notes, the cost of not being innovative can be substantial, as many companies fail as a result of being overtaken in the marketplace by competitors with more advanced products and services. This report presents a comprehensive logistics and financial plan for Café Andino S.A.S., a Colombian MSME that produces and exports premium roasted coffee to the United States market.

Coffee is one of the most essential commodities globally, with Colombia holding a strong position in international export rankings (Gois et al., 2022). According to the USDA Foreign Agricultural Service (2025), the United States remains Colombia's largest coffee export market, accounting for nearly 40 percent of total exports, with exports rising to 5.3 million bags in marketing year 2024/2025. This report integrates supply chain design at both the national and international levels, leveraging Big Data analytics, and includes a five-year financial projection with essential financial statements and investment metrics. The goal is to demonstrate the viability, sustainability, and strategic value of the chosen MSME's international expansion.

Justification

The development of this project is justified by the need for Colombian MSMEs to strengthen their competitiveness in highly demanding international markets such as the United States. In a globalized environment, efficient logistics, data analysis, and financial planning become key factors for business sustainability. De Felice et al. (2025) describe the global coffee supply chain as one of the most complex and globalized systems, involving a network that includes millions of farmers, exporters, producers, and consumers from cultivation to consumption.

Café Andino S.A.S. has a high value-added product that can be favorably positioned in the international market. Consumer trends support this opportunity: De Felice et al. (2025) report that over 60 percent of consumers in North America and Europe prefer coffee certified as organic, Fair Trade, or Rainforest Alliance, and are willing to pay a premium for traceable, single-origin products. Capturing this demand requires a structured supply chain, regulatory compliance, and rigorous financial evaluation to support strategic decision-making.

This work contributes practical knowledge on the application of logistics, Big Data, and finance concepts, aligned with the program's academic objectives. López et al. (2026) confirm that food and beverage SMEs can overcome innovation, financial, and efficiency barriers by strategizing supply chain collaborations, thereby improving their overall performance. This makes the project both academically and practically relevant.

Objectives

General Objective

To design a national and international logistics system and develop a five-year financial projection for Café Andino S.A.S., supporting its premium roasted coffee export strategy to the United States.

Specific Objectives

Develop the national and international supply chain for the micro, small, and medium-sized enterprise (MSME).

Calculate the projected financial performance over five years.

Determine the Internal Rate of Return (IRR) of the project.

Unify logistics, Big Data, and financial analysis into a single strategic proposal.

Company Information

Café Andino S.A.S. is a Colombian company dedicated to purchasing green coffee from certified producers, and processing, roasting, and packaging it to guarantee high quality standards. According to the USDA FAS (2025), small-scale farming is a hallmark of Colombian coffee production, with approximately 60 percent of production on farms of less than 5 hectares, and with over 550,000 producers, coffee remains the country's third-largest export commodity.

The company is characterized by its focus on sustainability, traceability, and added value. Bettín Díaz et al. (2022) emphasize that traceability in origin coffee is essential for describing the source, including the farm, region, climate, and the entire production process, a key competitive factor in specialty markets. Its business model combines efficient logistics, partnerships with local suppliers, and data-driven decision-making. The USDA FAS (2025) reports that approximately 40 percent of Colombia's coffee production is considered specialty coffee and incorporates significant price premiums, a segment in which Café Andino S.A.S. aims to compete. Table 1 summarizes the company's profile.

Table 1

General Profile of Café Andino S.A.S.

Attribute	Detail
Company Name	Café Andino S.A.S.
Type of Company	Micro, Small, and Medium Enterprise (MSME)
Country of Origin	Colombia
Sector	Agribusiness – Coffee Production and Marketing
Main Product	Premium Roasted Coffee
Target Market	United States

Note. Information based on the company's current operational and commercial structure.

MSME Logistics Planning: National and International Supply Chain

Based on the chosen product (roasted coffee), a logistics system is established for MSME Café Andino S.A.S. with the export market (United States) in mind. De Felice et al. (2025) describe the coffee value chain as comprising four primary phases: cultivation, processing, roasting, and consumption, a structure that remains consistent regardless of the country of production or consumption. This logistics structure is divided into national and international components, creating a unified supply chain designed to ensure efficient operations, maintain product quality, reduce costs, and comply with international trade regulations.

National Supply Chain (Colombia)

The logistics process at the national level begins at the point of origin of the raw material and concludes at the port of departure for export.

Obtaining Raw Materials

Café Andino S.A.S. obtains green coffee from certified producers in coffee-growing regions of Colombia, such as Huila, Antioquia, and the Coffee Axis. Suppliers are selected based on quality, sustainability certifications, and the capacity for continuous supply. As the USDA FAS (2025) notes, as of 2025, 87 percent of Colombia's coffee-growing areas are planted with rust-resistant varieties, reflecting ongoing improvements in agricultural productivity and supply reliability.

Transportation to the Processing Plant

Green coffee is shipped by land via local logistics operators to the company's roasting and packaging plant. This transportation is planned based on demand forecasts to minimize inventory costs and prevent delays.

Processing and Value Addition

At the processing plant, the coffee undergoes roasting, grinding (if necessary), quality control, and packaging. The packaging is designed to preserve the aroma and freshness of the product, using vacuum-sealed or modified atmosphere bags suitable for export.

Storage and Inventory Control

Finished products are stored in dry, temperature-controlled warehouses. Inventory management is carried out using a FIFO (First In, First Out) system to ensure product freshness and minimize the risk of spoilage. Pooja & Ailawalia (2024) affirm that effective inventory management involves maintaining the right balance of stock through data science algorithms that optimize inventory levels based on real-time demand patterns, lead times, and safety stock requirements.

National Distribution to the Port

Once export orders have been consolidated, the packaged coffee is transported by road to the ports of Cartagena or Buenaventura, according to the shipping schedule and logistical cost efficiency.

International Supply Chain (Export to the United States)

International logistics ensures compliance with regulations and the timely delivery of the product to the destination market.

Export Documentation and Customs Procedures

Café Andino S.A.S. prepares the necessary export documentation, including the commercial invoice, packing list, certificate of origin, phytosanitary certificate, and customs declaration. Bettin-Díaz et al. (2022) highlight that blockchain technology can provide traceability, transparency, and security across supply chain transactions, helping ensure that

every end customer receives authentic Colombian coffee. A customs broker assists in complying with Colombian and U.S. regulations.

International Transportation

Roasted coffee is primarily exported by sea, in both less-than-container load (LCL) and full container load (FCL), depending on the shipment volume. This mode of transport is chosen for its reduced cost and suitability for dry and non-perishable products.

Port of Entry and Customs Clearance in the United States

Upon arrival at ports in the United States, such as Miami or New York, the merchandise is inspected and cleared through customs in accordance with FDA and USDA regulations. It is essential that the labeling is correct and that food safety guidelines are met at this stage.

Marketing in the U.S. Market

Once the customs process is complete, the products are shipped to distribution centers or sent directly to importers, wholesalers, specialty coffee shops, or online sales platforms. De Felice et al. (2025) confirm that consumers are increasingly prioritizing sustainability, transparency, origin specificity, and ethical sourcing in their purchasing decisions, making certifications and traceability critical competitive factors. Establishing strategic partnerships with local distributors helps reduce last-mile delivery costs and increase market coverage.

Integration of Logistics and Big Data

Big Data analytics has become a transformative tool for supply chain management. Niyonzima (2024) describes big data as an essential raw material for producing timely and accurate information that drives rapid decision-making and competitive advantage. Pooja & Ailawalia (2024) affirm that harnessing data science is revolutionizing supply chain management by enabling businesses to optimize operations, enhance efficiency, and reduce costs.

For Café Andino S.A.S., the integration of Big Data enables several key operational improvements. In the area of demand forecasting, Pooja & Ailawalia (2024) note that machine learning and predictive analytics enable businesses to make informed demand forecasts, which is essential for inventory management and production planning. In the area of risk management, data science tools can analyze historical data, identify potential disruptions, and develop mitigation strategies (Pooja & Ailawalia, 2024). In the area of route and logistics optimization, data science provides insights that enable businesses to optimize transportation routes, production schedules, and resource allocation (Pooja & Ailawalia, 2024).

De Felice et al. (2025) highlight that artificial intelligence and geographic information systems play crucial roles in coffee supply chain optimization, from forecasting demand to improving logistics efficiency. The rise of IoT devices also enables real-time monitoring of temperature, humidity, and storage conditions at various stages of the chain (De Felice et al., 2025). Niyonzima (2024) confirms that the integration of Big Data analytics into supply chain optimization presents significant opportunities for firms to enhance competitiveness, and that firms that successfully leverage these tools achieve superior performance in delivery times, cost management, and customer satisfaction.

Five-Year Financial Projection of the Project

To analyze the economic and financial viability of Café Andino S.A.S.'s roasted coffee export project to the U.S. market, a five-year financial projection is prepared. As Avagyan et al. (2022) establish, financial projections are critical in the selection of innovative projects, as they provide a structured basis for evaluating future performance, assessing risk, and guiding resource allocation under uncertainty. This projection includes the income statement, cash flow statement, projected balance sheet, and Internal Rate of Return (IRR) calculation, each of which is addressed in the following subsections.

General Assumptions of the Financial Projection

The financial projection is developed based on the following assumptions:

- Annual sales growth of 8%, driven by the product's consolidation in the U.S. market.
- Moderate increase in operating costs of 5% per year, associated with inflation and logistical expansion.
- An initial investment allocated to the acquisition of roasting machinery, plant upgrades, working capital, and export costs.
- A cost structure comprised of production, logistics, marketing, and administrative expenses.
- A five-year evaluation horizon.

Projected Income Statement (5 years)

Table 2 presents the projected income statement, showing the evolution of the project's revenues, costs, and profits. In the first year, Café Andino S.A.S. shows moderate revenues due to its initial market phase. However, starting in the second year, a gradual increase in sales is observed, resulting from the growing recognition of Colombian roasted coffee in specialized

sectors. Avagyan et al. (2022) note that the presentation of financial projections is likely to influence firms' innovation selection decisions, reinforcing the value of a structured, multi-year financial view.

Table 2

Five-Year Projected Income Statement for Café Andino S.A.S. (COP)

Concept	Year 1	Year 2	Year 3	Year 4	Year 5
Sales Revenue	250,000,000	270,000,000	291,600,000	314,928,000	340,122,240
Production and Logistics Costs	150,000,000	157,500,000	165,375,000	173,643,750	182,325,938
Gross Profit	**100,000,000**	**112,500,000**	**126,225,000**	**141,284,250**	**157,796,302**
Operating and Administrative Expenses	40,000,000	42,000,000	44,100,000	46,305,000	48,620,250
Operating Profit	**60,000,000**	**70,500,000**	**82,125,000**	**94,979,250**	**109,176,052**
Tax (30%)	18,000,000	21,150,000	24,637,500	28,493,775	32,752,816
Net Profit	**42,000,000**	**49,350,000**	**57,487,500**	**66,485,475**	**76,423,236**

Note. Values expressed in Colombian pesos (COP). Tax rate applied at 30% of operating profit.

Project Cash Flow (COP)

It is assumed that net income represents free cash flow, given that there is no external financing or large depreciations in the period. As shown in Table 3, the estimated cash flow demonstrates the project's ability to generate sufficient liquidity to cover its operating and financial obligations. During Year 0, a negative cash flow is observed due to the initial investment. From Year 1 onward, operating cash flow becomes positive and continues to increase, allowing the company to cover costs, reinvest in operations, and strengthen working capital. Avagyan et al.

(2022) emphasize that scenario presentation can reduce perceived project risk by placing bounds on expected outcomes, which is reflected in this conservative but consistent cash flow structure.

Table 2

Five-Year Projected Free Cash Flow for Café Andino S.A.S. (COP)

Year	Cash Flow (COP)
0	-120,000,000
1	42,000,000
2	49,350,000
3	57,487,500
4	66,485,475
5	76,423,236

Note. Year 0 represents the initial investment of COP 120,000,000. Net profit is used as a proxy for free cash flow.

Projected Balance Sheet

Table 4 presents the projected balance sheet, which shows a robust financial structure for Café Andino S.A.S. at the end of the five-year period. Assets increase steadily due to growth in inventory, accounts receivable, and productive assets. Liabilities remain at controlled levels, demonstrating a prudent debt policy. Equity grows annually thanks to the reinvestment of profits, improving the company's solvency. López et al. (2026) confirm that food and beverage manufacturing SMEs can improve their sustainable performance when supply chain collaborations and sound financial management are aligned, which is precisely the approach reflected in this balance sheet structure.

Table 4

Projected Balance Sheet Summary for Café Andino S.A.S. — Year 5 (COP)

Concept	Value (COP)
Assets	
Current Assets	140,000,000
Non-Current Assets	180,000,000
Total Assets	**320,000,000**
Liabilities	
Total Liabilities	90,000,000
Equity	
Capital + Retained Earnings	230,000,000

Note. Summary reflects projected financial position at the end of Year 5. Values expressed in Colombian pesos (COP).

Internal Rate of Return (IRR)

The Internal Rate of Return (IRR) is obtained from the project's anticipated cash flows as presented in Table 3. The IRR of 32% is significantly higher than the Minimum Acceptable Rate of Return (MARR) of 12%, which confirms that the project generates value and that the investment in roasted coffee exports is financially attractive and fully justified. Avagyan et al. (2022) state that the greater the perceived project risk, the lower the likelihood that a decision-maker funds a proposed innovation project; conversely, the strong IRR result in this case substantially reduces that concern and supports the allocation of resources to the project.

Conclusions

Café Andino S.A.S. demonstrates significant potential for international growth, supported by a logistics structure that covers the entire value chain from certified producers in Huila, Antioquia, and the Coffee Axis, through processing and packaging, to the ports of Cartagena or Buenaventura and onward to U.S. entry points such as Miami and New York. The company's focus on traceability and sustainability certifications responds directly to the growing preference among North American consumers for single-origin, ethically sourced products, representing a concrete and expanding market opportunity.

The integration of Big Data into logistics operations further strengthens the company's competitive position. The application of predictive analytics, IoT monitoring, and AI-based demand forecasting can significantly improve inventory decisions, reduce logistics costs, and anticipate fluctuations in the U.S. specialty coffee segment, translating into measurable gains in delivery times, cost management, and customer satisfaction.

From a financial perspective, the five-year projection confirms the viability and attractiveness of the export project. Revenue grows steadily from COP 250,000,000 in Year 1 to COP 340,122,240 in Year 5, cash flows remain positive from Year 1 onward, and the balance sheet reflects a low-debt, equity-driven structure at the end of the evaluation period. The IRR of 32%, substantially exceeding the MARR of 12%, confirms the economic attractiveness of the investment and fully justifies the allocation of resources to the project.

Overall, this proposal demonstrates how Colombian MSMEs can effectively integrate logistics management, Big Data analytics, and financial strategy to achieve sustainable international growth. The case of Café Andino S.A.S. serves as a replicable model for other agribusiness firms seeking to enter specialized export markets.

Bibliographic References

Avagyan, V., Camacho, N., Van der Stede, W. A., & Stremersch, S. (2022). Financial projections in innovation selection: The role of scenario presentation, expertise, and risk. International Journal of Research in Marketing, 39(3), 907–926. https://doi.org/10.1016/j.ijresmar.2021.10.009

Bettin-Díaz, R., Rojas, A. E., & Mejía-Moncayo, C. (2022). Colombian origin coffee supply chain traceability by a blockchain implementation. SN Computer Science, 3(6), 64. https://doi.org/10.1007/s42979-022-00174-4

De Felice, F., Rehman, M., Petrillo, A., & Baffo, I. (2025). Decoding the coffee supply chain: A systematic review of stakeholders, sustainability opportunities, and challenges. Sustainable Futures, 10, Article 101105. https://doi.org/10.1016/j.sftr.2025.101105

Gois, T. C., Thomé, K. M., & Balogh, J. M. (2022). Behind a cup of coffee: International market structure and competitiveness. Competitiveness Review: An International Business Journal, 32(4), 1–17. https://doi.org/10.1108/CR-02-2021-0026

Harper, G. D. J. (2026). Innovation. In Salem Press Encyclopedia. https://research-ebsco-com.bibliotecavirtual.unad.edu.co/linkprocessor/plink?id=b03a81a4-9b79-3e60-ad01-ba30fe73aa80

Horvat, D., Jäger, A., & Lerch, C. M. (2025). Fostering innovation by complementing human competences and emerging technologies: An industry 5.0 perspective. International Journal of Production Research, 63(3), 1126–1149. https://doi.org/10.1080/00207543.2024.2372009

López, C., Ruiz-Benítez, R., & Herrero, I. (2026). Can supply chain sustainability enhance the sustainable performance of SMEs? A triple bottom line approach. European Research on

Management & Business Economics, 32(1), 1–13. https://doi.org/10.1016/j.iedeen.2026.100301

Niyonzima, C. (2024). The use of big data analytics in supply chain optimization. Kiu Publication Extension, 3, 40–57.

Pooja, & Ailawalia, P. (2024). Supply chain optimization with data science. Grenze International Journal of Engineering & Technology, 10(2), 137–147. https://research-ebsco-com.bibliotecavirtual.unad.edu.co/linkprocessor/plink?id=cd086d3a-0234-3c70-939b-7124110b21d9

USDA Foreign Agricultural Service. (2025). Coffee semi-annual: Colombia (Report No. CO2025-0035). U.S. Department of Agriculture. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Coffee%20Semi-annual_Bogota_Colombia_CO2025-0035.pdf