

LESSONS FROM THE DEVELOPMENT OF CERTIFIED COFFEE SUPPLIERS PROMOTED BY AN INTERNATIONAL TRADER IN VERACRUZ, MEXICO

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ABSTRACT

This study specifies the lessons from a development program for suppliers implemented for more than 10 years by an international coffee trader with small-scale producers in Mexico, to fulfill the voluntary sustainability standards (VSS) required by their most demanding markets. The information was obtained in the year 2021, through semi-structured surveys, with a random sample of coffee growers (n=54), interviews with technical advisers (n=8), and operating staff (n=6) of the company. The information was analyzed with a mixed approach, to characterize the program and estimate the differential costs and benefits for the company and its suppliers. Results show that the implementation of the program required investing to develop a more complex and costly grocer's structure than purchases in the open market; however, the yields per hectare increased with the technical advice and better prices were attained from complying with the VSS. Thus, the trader stockpiled close to 2,400 additional tons of green coffee annually and managed to increase its profit in close to \$7.4 million USD per year, with an estimated differential annual cost of \$1.1 million USD. Likewise, coffee growers increased their income 1.7 times compared to a scenario without the program. The defining factor of these results is the presence of a "trailblazing company" with access to dynamic and solvent markets, which designed a mutual profit scheme with the small-scale producers and financed it with a vision in the medium term.

Keywords: economic impact, trailblazing company, sustainability.

INTRODUCTION

Consumption trends are a driver of the growing demand for sustainable products (Guimarães *et al.*, 2019; Maciejewski and Mokrysz, 2019; Muñoz-Rodríguez *et al.*, 2019). Therefore, the request for certifications or voluntary sustainability standards (VSS) is frequent, for the companies to gain access to specific market niches (de Marchi and di Maria, 2019; Silva *et al.*, 2019). This change means that the companies must take part in a high specificity of assets for the proliferation of specific private standards and the differentiation of quality as a competitive strategy (Mugwagwa *et al.*, 2020).

This differentiation is because of the demands from consumers, translated into greater willingness to reward the presence of specific attributes on the product (Ghezzi *et al.*, 2022). Thus, the companies take advantage of the opportunities for insertion in more solvent markets, redefining their production chains, and accepting the coordinated network interaction with other agents to increase the added value on the product; therefore, the management of the supply chain (SC) refers to the relationships of companies with suppliers, to deliver products or services with more value for their clients (Hernández and Pedersen, 2017).

Citation: Alarcón-Márquez MG, Santoyo-Cortés VH, Altamirano-Cárdenas J, Muñoz-Rodríguez M. 2024. Lessons from the development of certified coffee suppliers promoted by an international trader in Veracruz, Mexico. *Agricultura, Sociedad y Desarrollo*. <https://doi.org/10.22231/asyd.v21i2.1584>

ASyD 21(2): 186-206

Editor in Chief:
Dr. Benito Ramírez Valverde

Received: April 10, 2023.
Approved: June 14, 2023.

Estimated publication date:
March 12, 2024.

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In the agriculture and livestock sector, SCs require a more complex and risky management system due to the characteristics of agricultural products (perishability, dispersion, etc.) since they consider production, storage, processing and distribution (Borodin *et al.*, 2016). Derived from this, associations are a vital element of the SC in agribusinesses for the companies to have a constant supply of high quality agricultural raw materials (Liker and Choi, 2004; Mugwagwa *et al.*, 2020).

The supply of specialized raw materials can be done through a vertical integration of the chain, whether through their own production or through contract agriculture (CA) schemes (Ghezzi *et al.*, 2022). In CA, the links between the company and its suppliers depend on the transaction costs implicated by the specificity of the assets involved, the uncertainty, the frequency of transaction, and the incentives or benefits for each of them (González-Ramírez *et al.*, 2019; Mugwagwa *et al.*, 2020).

Frequently, the CA happens between companies and large-scale producers or producers that are already organized which manage to reduce the transaction costs, by decreasing the number of intermediaries in the chain (Mukucha and Chari, 2021; Swinnen and Kuijpers, 2020). However, working with small-scale producers is adequate when there is labor-intensive production with relatively small economies of scale, such as the production of coffee, fresh fruits and vegetables, or else when there is recognition about the inclusivity in the value chain and other social benefits in the market (Mukucha and Chari, 2021; Swinnen and Kuijpers, 2020). This affords the opportunity for a trailblazing company with access to dynamic markets and willingness to finance a project in the medium-term, to obtain benefits when implementing a supplier development program (SDP).

Commonly, the topic of supplier development emerges as a proposal to increase the performance in different models of vertical association between agriculture and livestock producers and companies; however, the studies that analyze the ex-post results of the implementation of a SDP are scarce. The analysis of study cases such as this one provides evidence for the design and implementation of public policies that facilitate the access of small-scale producers to differentiated and dynamic markets with the support of trailblazing companies. On the other hand, they offer guidelines for the companies to establish the necessary scopes and limits for supplier development as a strategy to improve their SC and to increase their competitiveness.

In Mexico, coffee is a strategic crop and there are approximately 500 thousand coffee growers that are mostly small-scale and together contribute 92.7% of the total production; there is an average surface smaller than 5 ha and a yield of approximately 1.5 t/ha, and it stands out that 80% of them live under conditions of poverty and reside in zones of high and very high marginalization (Secretaría de Agricultura y Desarrollo Rural-SADER, 2020). In these coffee-producing spaces, there are several rural companies involved in the coffee value chain, including stockpilers, traders, roasters and also large global companies that cover more than one link in the value chain; for example, Nestlé, California Coffee Exporter (Louis Dreyfus Company), Olam, and Agroindustrias Unidas de México (Grupo Ecom). Since the 1990s, the international market niches that value environmental and

social aspects of production have grown and represent solvent and dynamic markets that are addressed through certified coffee (Muñoz-Rodríguez *et al.*, 2019).

The objective of this research was to specify the lessons from a SDP implemented for more than 10 years for an international coffee (IC) trader with small-scale producers in Veracruz, Mexico. This case study is important because it involves unorganized small-scale producers, to address market niches that value environmental and social aspects of production, in addition to the coffee's cup quality.

THEORETICAL FRAMEWORK

Value chain and agricultural supply

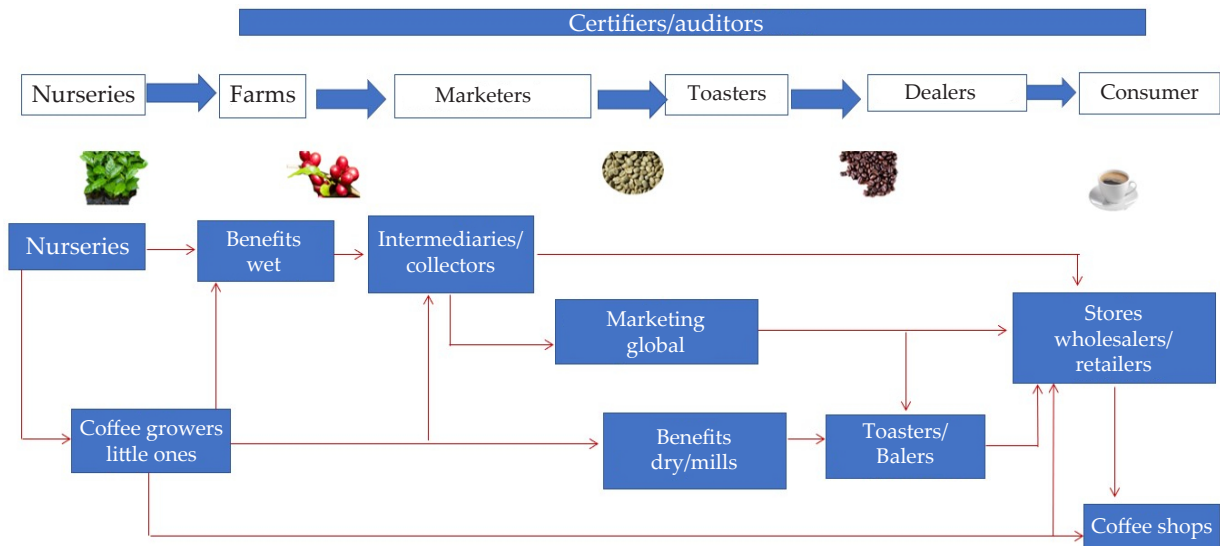
The value chain is a representation of the stakeholders involved along the productive process and the relationships between them. They all contribute to the development of the product in different links, adding value to the final product until its delivery to the consumer (Gereffi, 2018; Hernández and Pedersen, 2017; Parente-Laverde, 2020). Value creation along such a chain is achieved with the participation of a series of stakeholders that are not necessarily structured in a linear way, but rather in a network. Because of this, it is said that there is co-creation of value (Randmaa *et al.*, 2011).

The modernization of food value chains entails an increase in the coordination of links and, therefore, a governance structure (Organización de las Naciones Unidas para la Alimentación y la Agricultura-FAO, 2015). This governance emerged because within the chain there is a framework of agreements established by a component or group of components that all other stakeholders respect. Thus, when addressing the value chain, it is analyzed both at the level of governance, the identification of stakeholders that have greater decision power, and the flows of raw material, capital, information and norms. Figure 1 exemplifies the flow of raw material in the coffee value chain, as well as the stakeholders involved in it.

In addition to this, the concept of SC emerges, which refers to producers, processors, traders, and distributors linked in a chain to supply the materials and inputs for the elaboration of a product. Considering that the management of the SC is a key element of success and competitiveness of the business, Pereira Isidro *et al.* (2021) indicated that this management includes planning and coordination of all the people, processes and technology involved in value creation for a company inside and outside of it.

Managing the supply reflects the need for development and logistics both of the supplier and of the client. Thus, the adequate management of relationships with suppliers constitutes an essential element of success for the SC at the organizational level. It also involves the transference of knowledge, the promotion of innovation, the improvement of standards of quality, and the implementation of efficient communication mechanisms in a transversal manner (Vargas-Moreno, 2014).

On the other hand, Saghiri and Wilding (2021) mentioned that the capacities of the SC require a continuous development that translates into a cooperative effort in the long term carried out by the purchasing company with its supplier to increase the performance and



Source: prepared by the authors with information from Muñoz-Rodríguez *et al.* (2019).

Figure 1. Flow of raw material in the coffee value chain.

capacities. Therefore, its success depends largely on the chain configuration (Thu-Tran *et al.*, 2021). Nevertheless, the term performance includes a broad range of results, such as product quality, service provision, innovation, sustainability and cost; frequently, the delivery time and fulfillment of requirements in the product are taken into account as criteria for evaluation.

Vargas Moreno (2014) indicated that management of the SC can represent up to 50% of a company's costs. Meanwhile, Saghiri and Wilding (2021) mentioned that the cost from ill performance of the supplier can represent 4% of the sales for the buyers. To avoid these inconveniences, the basic activities of supplier development include their evaluation, selection and allocation.

In the farming sector, Ferreira-Guimarães *et al.* (2021a) indicated that the production of differentiated products implies a greater specificity in the assets, and more complexity in the dimensions involved both in the transaction and in the investments for innovation. In differentiated products such as specialty coffee, it is necessary to establish relationships between all the chain's stakeholders and, especially, with suppliers of raw materials because the quality largely depends on this link, which is why supply management is fundamental.

Supplier development tends to be carried out under CA plans that confer governance to the supply chains by strengthening the coordination between agroindustry and farmers (Mugwagwa *et al.*, 2020; Mukucha and Chari, 2021; Widadie *et al.*, 2020). In this modality, the purchasing companies include assistance and agricultural extension programs, as well as financing plans to support the purchase of inputs or to cover the necessary working capital (Mukucha and Chari, 2021).

The CA implies compensations between incentives and risks, for example, to provide premiums on the price in exchange for the farmers to comply with the requirements of quality, delivery volumes, etc. (Mukucha and Chari, 2021). However, for small-scale producers, these agreements imply quality requirements that are hard to fulfill and reduced flexibility to change buyer if it is not attractive (Widadie *et al.*, 2020). Based on the study by Ghezzi *et al.* (2022), this development can emerge simply with the presence of a trailblazing company that provides the conditions observed in the CA, without strict establishment of obligations for both parts.

The level of participation of the buyer in the development practices of suppliers is fundamental. The study carried out by Ghezzi *et al.* (2022) showed that in order to maintain a cooperative relationship with its producers, a company must play a trailblazing role, because to maintain their competitiveness these companies are the ones that monitor the change in consumption trends, which emerge from the change in economic, environmental and livelihood patterns, and the perception of people regarding the products they seek in the market (Maciejewski and Mokrysz, 2019; Muñoz-Rodríguez *et al.*, 2019). In addition, Saghiri and Wilding (2021) considered that the size and integration of the supplier, the complexity of the product, and the supply system management are moderators of the SDP, in addition to competition and technological change, the size of the purchasing company and the buyer-supplier relationships.

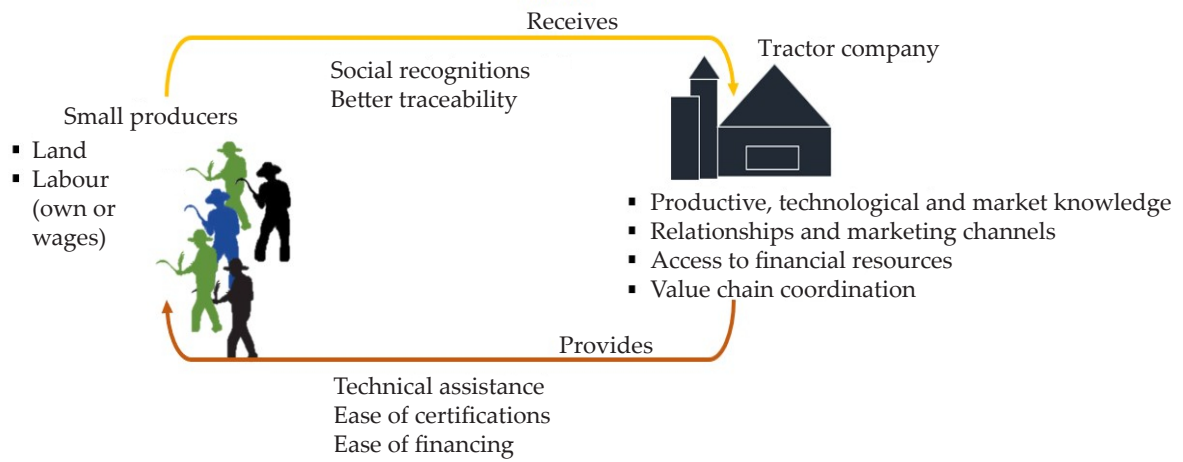
The dominating attributes in the integration of suppliers include sharing strategic information and benefits, in addition to establishing a buyer-supplier relationship in the long term and of mutual trust; however, the ability of third parties to appropriate it is one of the greatest challenges for the trailblazing company (Ghezzi *et al.*, 2022).

For this purpose, horizontal arrangements foster innovations due to the cooperative behavior, the reduction in opportunist behavior, and a greater flow of knowledge between agents. Meanwhile, vertical arrangements are important mechanisms in the development of innovations because they make possible the reduction of uncertainty (Ferreira-Guimarães *et al.*, 2021a; Ferreira-Guimarães *et al.*, 2021b). Therefore, the SDP are useful to respond to current competitive challenges.

Although the relationship is promoted and directed by the trailblazing company, the interdependence in the scheme is mutual (Figure 2) and must generate benefits for both parts to be sustainable.

Integration of sustainability in agricultural supply chains

The importance of addressing climate change generates pressure on the public and private sector to use natural resources moderately. Therefore, the companies carry out adaptations in the presence of environmental and social challenges that affect them directly; in addition, the demands from global consumers foster implementing an integration of sustainable practices in their activity, and thus restructure their role in the global value chain to which they are integrated (Watson *et al.*, 2020). Therefore, the role that sustainable production and caring for the environment play is increasingly important. Facing this panorama, some



Source: prepared by the authors.

Figure 2. Complementarities between small-scale producers and a trailblazing company.

companies are in search for a way to comply with voluntary sustainability standards (VSS) that attempt to mitigate negative socioenvironmental impacts and to create economic benefits (Molenaar *et al.*, 2015).

Innovation within agricultural SCs, and particularly for the stakeholders that promote and adopt it, derives in the value aggregation on its product and also in changes on the way of working (Ghezzi *et al.*, 2022). There is a tendency to include sustainability in the management of SCs through the certification of good social and environmental practices for production and manufacture, which originates an entry barrier to the most demanding and solvent markets (Silva *et al.*, 2019; Vargas-Moreno, 2014). However, evaluating the degree of sustainability present in the SC is complex and rarely evaluated (Moreno-Miranda and Dries, 2022).

Thus, the demands for agribusinesses are broadened and with that the control they must have on the SC and its internal process. This reaffirms that an interdisciplinary approach is required to cover all the dimensions of sustainability, and particularly to evaluate the level of coordination there is between the stakeholders involved (Moreno-Miranda and Dries, 2022). The organizations strongly involved in the agricultural sector have adopted 4.0 technologies, collaboration and shared responsibility in the SC, as part of the future of sustainability. This is because both their chains and their agreements and configurations have an essential role for the fulfillment of the Sustainable Development Goals (SDGs) of the United Nations (Sharma *et al.*, 2020; Moreno-Miranda and Dries, 2022). In addition to the demands for market niches that value environmentally responsible production, Ghezzi *et al.* (2022) state that both global agribusinesses and small-scale producers are directly facing environmental challenges.

It should be stated that in the most complex governance structures that characterize the value chains of differentiated products, it is important to establish transactions based on

trust, contracts, long-term relationships, associations and relational networks (Ferreira-Guimarães *et al.*, 2021b). The growing importance of environmental accountability leads companies to implement management systems that ensure that this component is transversal in the entire organization, and articulated with strategic planning (Vargas Moreno, 2014). This entails devoting resources to improve their internal processes and to develop their suppliers.

Making changes in the supply chain to align actions directed at the achievement of the SDGs entails a structural change in the chain itself, which together with the approaches of the company, seek to reach social and economic development and bring with them trade-offs for the company. The first of them is the increase in the product's unit price (Maush *et al.*, 2020).

Costs associated with supplier development

Production chains in modern markets are constantly modified by the preferences of consumers and the incorporation of the concept of sustainability. Therefore, innovation in the production, management and coordination processes are necessary for the companies to maintain and increase their competitiveness.

The insertion in exclusive markets and the attention to specific clients together with productive changes in order to obtain differentiated products, for example the acquisition of certifications, represent additional costs. Because of this, the company must ensure the relationship with specialized clients and define the differential costs of this market segment; that is, costs in which it incurs to satisfy their specific commercial demands (Ghezzi *et al.*, 2022). In addition, the company that works with small suppliers must coordinate obtaining certifications, establish extension mechanisms, and obtain resources to finance the productive changes implicated by certifications.

Because of this, the supplier development process in the supply chain implies capital investment for the purchasing company, training of technical staff, and advice on effective operative procedures (Ghezzi *et al.*, 2022), since for small-scale producers it tends to be a difficult investment to face on their own. Likewise, it implies efforts to maintain a network of competent suppliers, to satisfy the supply needs of buyers, through investment in training (Mukucha and Chari, 2021). The specialized production implies greater efforts as requirements for labor and higher production costs, and also higher transaction costs, due to greater specificity of the assets and higher complexity in the codification of information, which requires complex governance structures (Ferreira-Guimarães *et al.*, 2021b). These fixed costs tend to dissipate in the long term, as long as the production volume increases and the sale prices reward the investment made.

It should be mentioned that adopting a certification from a third party is a demand from clients, since it contributes to the increase in reliability regarding the presence of quality attributes. Although these prevent the creation of a company structure for this purpose, they do represent an additional cost with an external supplier (Ferreira-Guimarães, *et al.*, 2021b).

METHODOLOGY

Characteristics of the study case

The study was conducted in the High Mountainous zone in the state of Veracruz, where coffee producers were interviewed in the municipalities of Ixhuatlán del Café, Córdoba, Tepatlaxco and Tomatlán (Figure 3), who are part of the suppliers' registry of an international coffee (IC) trader. The IC involved has worked in Mexico for more than 30 years, devoted primarily to stockpiling and trading of conventional coffee; it has a strong presence in the main coffee-producing states in the country. In 2006, it designed and implemented a supplier development program (SDP) exclusively in Veracruz, with the aim of satisfying the coffee demands with the Rainforest Alliance (RA) and sustainable



Source: prepared by the authors.
Figure 3. Study zone.

production and quality Coffee (Nespresso AAA) certifications. Both certifications seek a high cup quality and the fulfillment of various social and environmental specifications. Within the SDP, the IC took the role of trailblazing company with the aim of executing a similar supplier scheme to the one observed in CA schemes, although without formalizing a buying and selling contract, but rather signing only a Participation Agreement. Currently, the supplier registry is made up by 1,363 coffee growers from municipalities such as Ixhuatlán del Café, Tepatlaxco, Córdoba and Fortín, in the state of Veracruz, which have a production of 9,052 t, 5,095 t, 760 t, and 533 t; and a surface of 5,583 ha, 2,815 ha, 1,992 ha and 1,793 ha, respectively (SIAP, 2022). This region has a high degree of social marginalization (CONAPO, 2022), it is of difficult access, with reduced production surfaces and fragmented lands or high slopes, so cultivating coffee is one of the few productive options.

Information collection and data analysis

The relevance and structure of the SDP was analyzed longitudinally and transversally, contrasting the good practices signaled by institutions such as the International Institute for Sustainable Development (IISD), the Economic Commission for Latin America and the Caribbean (ECLAC), and the Food and Agriculture Organization of the United Nations (FAO), among others. In addition, queries were made in websites, with the specifications required by the Rainforest Alliance and Nespresso AAA certifications and statistics with information about conventional and certified coffee.

Field information collection was carried out in the year 2021, through semi-structured interviews with eight technical advisers, six administrative, and a random sample of 54 coffee producers that are part of the supplier registry of differentiated coffee, and this size represented slightly more than 5% of the universe and was established based on the availability of resources. For the case of producers, aspects such as the following were inquired about: productive characteristics of their farm (surface, yields, and varieties); coffee trade with the company, both in their situation at the beginning and the situation at the time of performing this study. Based on this information, considering the role and function of each stakeholder, the structure of the program implemented and the factors with most relevance in its design were described. The information, norms, raw material and economic flows in the value chain were also outlined.

A point of reference was not established at the beginning of the SDP, since the participants entered progressively, and therefore the situation that interview respondents reported as present before entering the SDP was considered as the base line (BL), and the situation they were in at the time of collecting the information as the final line (FL). In addition, as part of the interviews with coffee producers, data were collected about their production units (yields, surface, varieties, agricultural practices performed, etc.).

In addition to the information provided by the IC staff, information was collected from specialists related to certifying companies, providers of agronomic technical services, public data in websites, and interviews with managers, considering variables associated to

the evolution of the operation of the SDP, problems presented, adjustments carried out and results obtained, with the aim of estimating the costs which both the IC and the coffee producer incurred in when becoming integrated into this new supply scheme.

A database was constructed with the information collected, which was analyzed with descriptive statistics, and in addition a parametric paired means comparison was made on the levels of yield between the BL and the FL; the statistical SPSS software was used in both cases. The impact of the income levels for coffee producers that the program resulted in, compared to the option of it not existing, was estimated based on this and with the prices to purchase cherry indicated by coffee producers, as well as the prices of green coffee published in the Guide for specialty coffee prices issued by SCA (2022), and the prices in C contracts by the New York stock exchange for the 2021-2022 period.

Because of the limited access to commercial information from the company, estimations were made about the annual coffee profit margin obtained by the IC with a conventional coffee stockpiling model, compared to one with coffee differentiated by acquiring certifications. Lastly, transversal inquiry was made into the lessons derived from this study case for the IC and their use for analogous companies, thus performing a characterization of the SDP in terms of its justification, implementation, operative results, and impact on the producers and the IC.

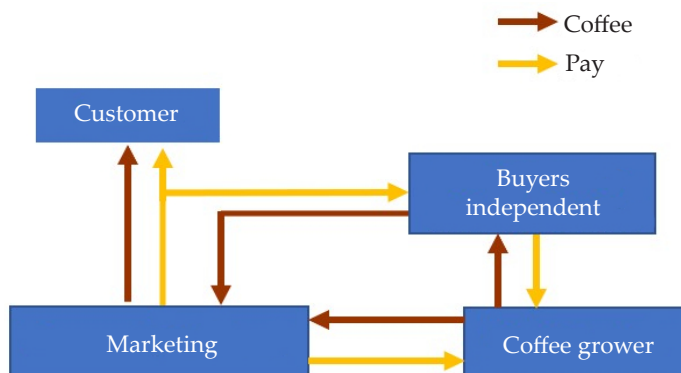
RESULTS

Strategic justification of the SDP

The IC based its supplier development strategy on the VSS as differentiating elements for quality and prices where traditionally there had only been a commodity. Thus, certified coffee went from being close to 1% of the global coffee trade in the year 2000, to representing 15% of the global production for 2008 (Potts *et al.*, 2014). Meanwhile, for the IC, certified coffee went from being 2.8% of its global sales in 2005, to 13.5% in 2008 (FIRA and SAGARPA, 2010).

In the traditional supply model (Figure 4), where the trader purchased conventional coffee through stockpilers who established temporal selling points in the coffee-producing communities, or else, directly from coffee producers, there was a breach that prevented guaranteeing the compliance of the requirements for certifications, as well as achieving improvements in the productivity to benefit all stakeholders.

Thus, the IC decided to develop strategic management in its supply chain to address market segments that demanded the fulfillment of some VSS, so that the SDP was based on a new supply scheme, since the link in the prior model was strictly commercial at the time of buying and selling, without incentives or additional information flows. In addition, considering that the VSS directed by the Starbucks C.A.F.E Practices and Nespresso AAA companies stood out within the global sales of certified coffee from the IC, to which 43.5% of the coffee was sold in 2008 (FIRA and SAGARPA, 2010). The development of the new plan was necessary to satisfy the demands from clients.



Source: prepared by the authors.

Figure 4. Structure of the coffee supply chain in the traditional model.

Implementation of the SDP

The implementation of the SDP was based on obtaining the Nespresso AAA certification to thus fulfill what Ghezzi *et al.* (2022) called 'access requirement' for this market niche. Because of this, the IC devoted resources to establish a team of technical advisers (TA) specialized in agronomy and with experience in coffee production, which translated the requirements of the certifications demanded by clients to good practices (GP) in production and manufacture, as well as conducting field training to disseminate the GP, monitor the performance of coffee growers, monitor the status of the farms, etc. It also defined the target population of suppliers for the program (producers with productive surface of less than 6 ha from a region where, from experience, there are adequate conditions to produce quality coffee). With these elements, promotion of the SDP was carried out in the region and activities began with coffee growers who signed the "Program Participation Agreement" (PA).

In this agreement, the producers committed to participating in the training events, adopting the good practices for production, and delivering part of their production to the IC. Economic aspects such as the criteria to receive the production, the economic bonus, if there is compliance with the quality at the moment of purchase and the buying price, are not established in writing, but rather they are communicated verbally to the producers during the harvest in meetings with the TA. With the universe of committed producers, the TA developed training and advising activities to promote the adoption of the GP catalogue to advance in the increase in productivity, the improvement in product quality, and to ensure the socioenvironmental responsibilities.

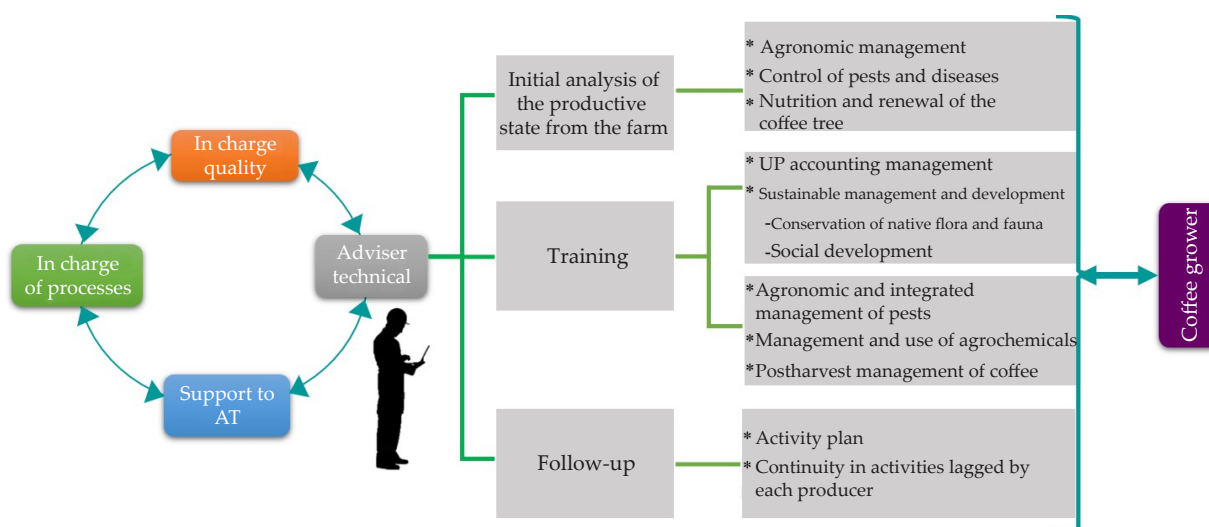
The emphasis in the promotion of each of the GP varied with the context of regional production. For example, after the blight outbreak, the substitution of varieties was the priority. It also adapted in function of the particularities of each plot or producer, which means that even with the same GP catalog, there was flexibility for each producer to adopt it in function of their requirements. Because of its continuous presence in the field, the

TA were rooted as the direct contact between the company and the coffee growers, and therefore, a support area for TA was created, to update them in technical aspects and program monitoring systems through training, tours and demonstrations; in addition to transmitting feedback in the areas of quality, processes and marketing associated to the strategy (Figure 5).

The IC established specific buying centers and facilities for wet processing, operated during the harvest season (November-March), with the goal of monitoring and controlling the stockpiling, process and trade of certified production to guarantee its traceability. On the other hand, two additional stakeholders became involved in the supply chain for the IC, the certification companies recognized by Nespresso responsible for verifying compliance with the VSS, in addition to giving feedback to improvement areas and advances of SDP in this aspect. The other stakeholder that was eventually incorporated was the credit dispersers that finance the renovation or annual management of plantations. It should be specified that their participation is not generalized with all the producers of the program, since there are producers who develop their plantations with their own resources.

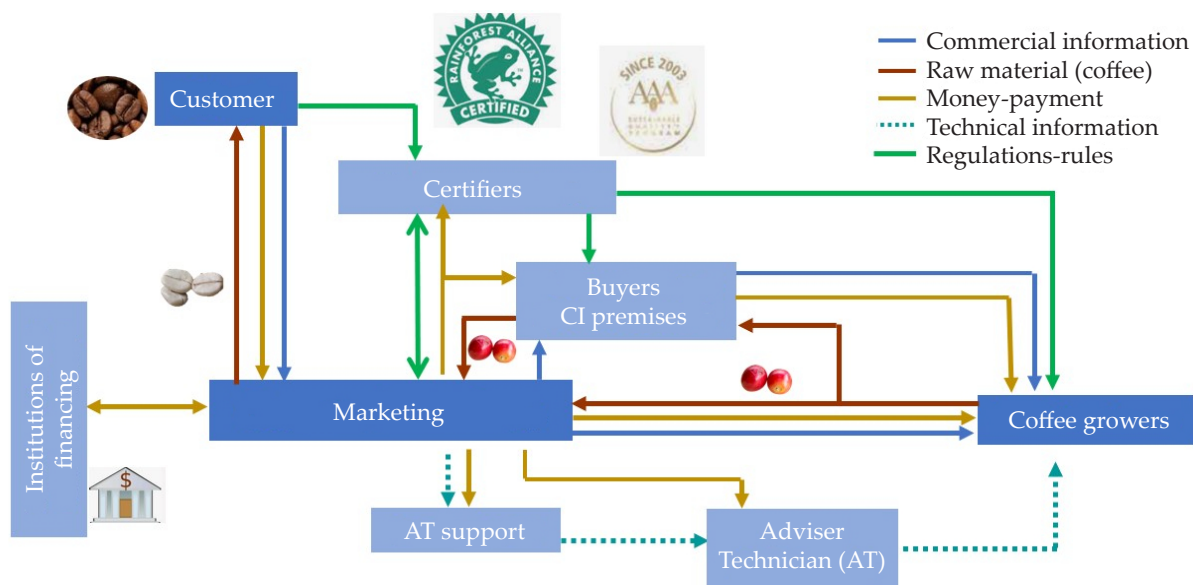
Operative results

The implementation had a relevant operative result, the management of a more complex and costly supply chain. In fact, when comparing the conventional supply scheme (Figure 4) with the structure of the SDP supply chain (Figure 6), it is clear that functioning of the SDP demanded investing in the development of much more complex marketing and communication structures, than the traditional supply model. This, given that not only commercial and logistic aspects of stockpiling are involved, but rather there was also the



Source: prepared by the authors.

Figure 5. Role of Technical Advisers (TA) in the operation of the SDP.



Source: prepared by the authors.

Figure 6. Structure of the supply chain and coffee value aggregation with SDP of the IC.

need to incorporate innovations in production and management of the supply chain to build a custom-made plan (Ferreira-Guimarães *et al.*, 2021a).

In addition to the investments required to establish the SDP, its annual operation requires an additional budget to that of the traditional supply. Table 1 shows the most important aspects, with an estimation of additional costs in which the IC incurred in 2020 for the operation of the SDP.

The working model proposed by the IC was attractive for the producers, as is shown by the evolution in the number of participating producers, which went from 60 in 2006 to 1,363 in 2021. This interest was higher among young producers, since the average age of the producers at the time of entering the SDP was 45 years old and in the last four years of the SDP the entry of coffee growers younger than 40 years has even increased by 18.7%.

Table 1. Estimation of annual costs for the IC when operating the SDP.

Concept	(\$USD)
Specialized technical staff	600,000
Support for technical staff: training, tours, demonstrations, vehicles and offices	250,000
Certification of the 4,418.32 hectares involved	150,000
Infrastructure for stockpiling and specific processing for the SDP	100,000
Total	1,100,000

Source: prepared by the authors. \$USD: US dollars.

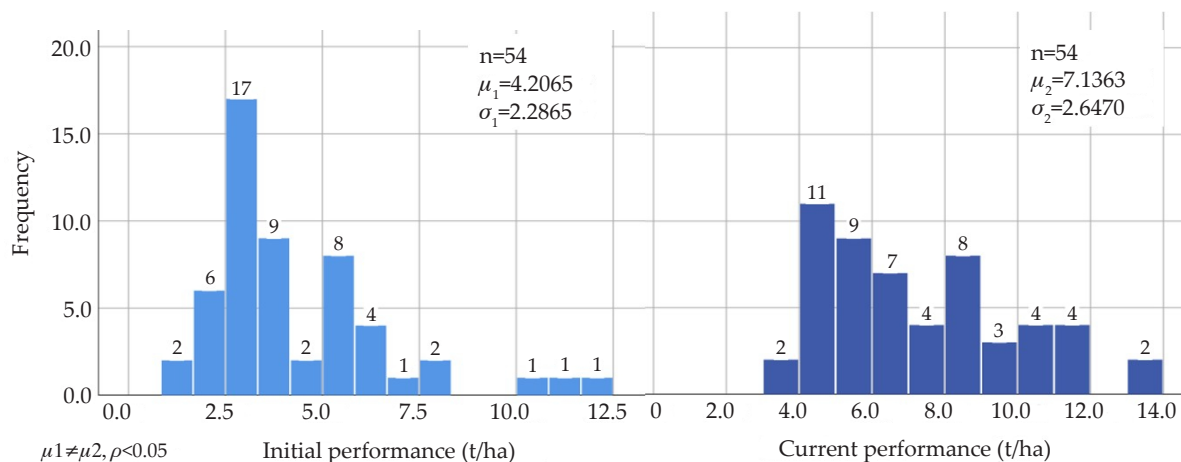
Impacts on the producers

After the integration of coffee growers to the SDP, the analysis of the sample interviewed showed that cherry coffee production per hectare had an increase, going from 4.2 to 7.1 t/ha on average for the sample (Figure 7).

This difference was statistically significant ($p < 0.05$), with an increase in average yield of 2.9 t/ha and generated economic benefits both for the company and for the coffee grower. On the other hand, the purchase price of conventional cherry coffee in the region of study was \$0.35 USD/kg, while the IC offered prices of \$0.56 USD/kg for certified coffee, including an additional bonus that ranged between \$0.04–0.06 USD/kg. Therefore, producers of the SDP have benefitted from two effects: the increase in production and the increase in the grain quality that they offer the company. According to the technical advisers, these results are consequence of performing selective harvesting, replacing Creole varieties susceptible to blight with tolerant varieties such as Marsellesa, planting with higher sowing density by changing to a plantation framework of 2x1m, and improving other farming tasks such as pruning, fertilization, and weeding of the farm.

Table 2 shows the effects of yield and quality that allowed increasing the income of producers, considering that all the production is stockpiled by the IC.

The incorporation of the coffee grower to this scheme also entailed an increase in costs from performing selective harvesting, replacing varieties, greater sowing density, and other farming tasks such as pruning, fertilizations and weed control. This represents an additional annual cost per hectare of approximately \$500 USD, which is broadly compensated by the additional income shown in Table 2. In addition, the additional tasks tend to be carried out by producers themselves, so they are not expenditure of resources, but rather an additional income for their work.



Source: prepared by the authors.

Figure 7. Means of cherry coffee yield among members of the SDP (BL and FL).

Table 2. Additional income scenarios for coffee growers that are members of the SDP.

Scenario	Income from sales (\$USD)	Differences in relation to the producer outside the program
1.Producer outside the SDP: Average yield=4.2 t/ha Sale price of cherry=\$0.35 USD/kg	1,472	0 (0%)
2. Yield effect of the SDP: Average yield=7.15 t/ha Sale price of cherry=\$0.35 USD/kg	2,501	\$1,029 (70%)
3. Price effect of the SDP: Average yield=4.2 t/ha Sale price of cherry=\$0.56 USD/kg	2,356	\$883 (60%)
4. Producer inside the SDP: Average yield=7.15 t/ha Sale price of cherry=\$0.56 USD/kg	4,002	\$2,530 (172%)

Source: prepared by the authors; \$USD: US dollars.

The purchase price was one of the two most important incentives for 80% of the coffee growers to enter the program, together with the purchase safety (31%). On the contrary, currently the most important incentives mentioned by the producers to remain in the program are technical assistance (50%), overprice (43%), and sustainability of their farm (28%). This change in valuation shows that producers recognize, after more than ten years of operation of the SDP, that they increased the yield, the quality in grain to be able to market it with overprice, and the environmental sustainability of their farm thanks to it. Even when 100% of the producers surveyed market cherry coffee, 35.2% make parchment coffee, 31.5% harvest natural coffee and 20.4% process it until roasted and ground to offer it in the local market. Despite some of the circumstances between the parties involved, the existence and stability of inter-organizational relationships have been maintained by a win-win vision.

Impact in the IC

When the company changes from a supply scheme of conventional coffee to one differentiated by certifications and quality, it increased the stockpiling costs of prime material (Table 3). However, it also achieved better sale prices, in fact, with public data from the New York Stock Exchange (2021) and the guide for green coffee prices of the Specialty Coffee Association (SCA) (2022), it was calculated that the gross margin for the company to purchase conventional coffee is \$0.56 USD/lb of green coffee and for certified coffee, \$0.91 USD/lb.

Although trading a differentiated product seems to require a greater investment, proportionally this margin is similar between both schemes in relative terms (39.1% and 39.6%, respectively), because the sale prices at which the company markets special coffee (84 quality points in cup) are 61.3% higher than in conventional products.

Table 3. Difference of commercial margins of conventional and certified green coffee for the IC.

	1. Conventional	2. Certified
Price of green coffee ¹ (USD/lb)	1.42 (100%)	2.29 (100%)
Gross margin for the IC (USD/lb green coffee)	0.56 (39.1%)	0.91 (39.6%)
Price of cherry coffee (USD/lb green coffee)	0.86 (60.9%)	1.38 (60.4%)
Price of cherry coffee (USD/kg)	0.35	0.56

¹2.47 kg of cherry coffee are required to produce one pound of green coffee.

Source: prepared by the authors with information from NYSE (2021), SCA (2022) and data from interviews.

Considering in addition that the increase in yield of the producers allowed for the company to stockpile 5,257.94 additional thousand pounds of green coffee, it is possible to estimate the changes in sales and in the profit margins resulting from the SDP for the IC (Table 4). Improvements in the yield of plots, without considering better prices from quality, generate 70% more of profit margin than without a program, while the better prices for quality, without considering better yields, increase the profit margin in 63%. The tasks of technical accompaniment, certification and traceability inherent to the SDP made possible the presence of the two effects simultaneously, leading the IC to have a profit margin up to 177% higher than the one received without implementing the SDP. With the commercial margins in both cases, the traditional costs of stockpiling, wet and dry processing, storage and export expenditure must be covered. However, in the case of the SDP, the operation cost of the program must also be considered, which was estimated

Table 4. Sale scenarios and profit margins with the SDP for the IC.

Scenario	Total production (pounds of green coffee)	Profit margin (USD)	Differences compared to the producer outside the program
1. Producer outside the SDP: Average yield=4.2 t/ha Sale price of cherry=\$0.35 USD/kg	7,523,476	\$4,178,354	0 0%
2. Yield effect of the SDP: Average yield=7.15 t/ha Sale price of cherry=\$0.35 USD/kg	12,781,414	\$7,098,484	\$2,920,130 70%
3. Price effect of the SDP: Average yield=4.2 t/ha Sale price of cherry= \$0.56 USD/kg	7,523,476	\$6,820,790	\$2,642,435 63%
4. Producer inside the SDP: Average yield=7.15 t/ha Sale price of cherry= \$0.56 USD/kg	12,781,414	\$11,587,640	\$7,409,286 177%

Source: prepared by the authors with information from NYSE (2021), SCA (2022) and interview data.

in \$1.1 million USD (Table 1), which is widely compensated by the increase in margins (Table 4).

DISCUSSION

The IC took advantage both of the market opportunity and its location in one of the most outstanding zones due to its coffee production. Thus, there was investment in a SDP to address the VSS of Nespresso, in a zone located at more than 1,200 m above the average sea level, recognized by the quality of its coffee cup. Thus, it was confirmed that the consumption trends and the demand for specific needs from clients are one of the market strengths that condition the demand for products, in this specialty coffee with the Nespresso AAA VSS (de Marchi and di Maria, 2019; Guimarães *et al.*, 2019; Maciejewski and Mokrysz, 2019; Muñoz-Rodríguez *et al.*, 2019; Silva *et al.*, 2019), and the companies that do not manage to move towards those changes will be left outside the global value chain.

In this sense, the SDP was not a circumstantial expense, but rather an investment with a vision in the medium term sustained by market trends. Considering that by 2013, Starbucks had managed for 90% of its supply to comply with its standards, and Nespresso 80%, it was timely to develop actions that could satisfy their requests and reliable supply schemes for certified coffee of high cup quality, and that at the same time were incorporated into a corporative approach for the management of the supply chain. It should be mentioned that the marketing company had the need to innovate in the management of the supply chain, which Goulet and Vinck (2013) called innovation by subtraction and addition. In the first place, it subtracted the independent intermediaries from the supply chain, and at the same time added local buyers with whom the IC ensured coffee stockpiling that complied with the Nespresso VSS and the RA certification criteria.

This same situation confirms three important conditions at the moment of executing a SDP. First, the implementers of the new scheme must identify and select adequate suppliers in terms of performance for the benefit of a purchasing company (Mukucha and Chari, 2021), since the success in supplier development lies in ensuring that they have the necessary capacity to be in the supply chain (González-Ramírez *et al.*, 2019). This is because covering the requirements of a niche coffee like Nespresso demands reliable suppliers that are specialized in providing it under a long term relationship. Therefore, the IC had to make specific investments to address this solvent market of fast growth (Ghezzi *et al.*, 2022; González-Ramírez *et al.*, 2019).

Second, the organization for the traceability of transactions stands out, as well as the mechanisms for promotion and dissemination of the adoption of GP, with the aim of ensuring compliance with the certifications and improving the yields of the farms (Ferreira-Guimarães *et al.*, 2021b).

Third, the coordination of the division of labor and information management of and for the stakeholders involved was developed with a more complex hybrid governance structure to achieve the incorporation of the VSS along the supply chain (Ferreira-Guimarães *et al.*,

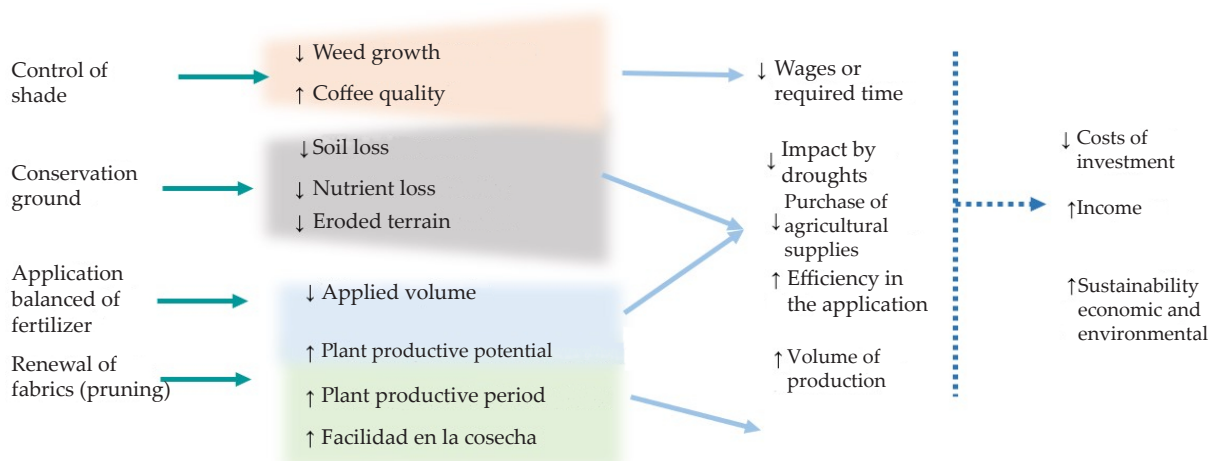
2021b). In this case, the IC maintained hierarchal governance in its internal management; relational governance between the client, the financing institutions, and the certifiers, due to the high levels of specifications; and captive governance with its suppliers, due to elevated monitoring for the adoption of innovations and compliance of certifications (Ponte *et al.*, 2019).

In sum, the management of a more complex and costly supply chain, inherent to the SDP, demanded managerial capacity from the IC to design the adequate model and willingness to invest in its implementation. As mentioned by Ferreira-Guimarães *et al.* (2021b), the financial incentive reflected in prices and higher profits is a fundamental instrument for the motivation of farmers, especially in the short term, since with the adoption or improvement of agricultural practices, they derived into a reduction of production costs for the coffee grower and an increase in income in the medium to long term (Figure 8).

On the other hand, it compensated the trade-offs in which the IC incurred when restructuring its supply chain, which were balanced out by the client when paying overprice for the VSS accreditations and the RA certification (Maush *et al.*, 2020).

In addition to the economic benefits achieved with the SDP by the IC, its participation contributes to the indicators of social responsibility by improving the income of small-scale producers in marginalized zones, through more sustainable production methods, such as shade management, soil conservation practices (such as weeding or level curves), adequate fertilization doses, renovation plans for farms, and pruning, etc. This agrees with Ghezzi *et al.* (2022), regarding agribusinesses working with small-scale producers to improve their corporative image and to enter socially responsible market niches.

Therefore, despite the relationship, it is not backed up by a contract between the IC and the coffee growers based on their commercial relationship, as it happens in the most common CA schemes. This informality has not generated problems for the parties, since



Source: prepared by the authors.

Figure 8. Impacts presented by the supplier development plan for coffee growers in the medium and long term.

the IC is the best sale option, since it captures all the certified coffee that it requires to cover its commitments, while the producers can sell to third parties the production that does not comply with the quality criteria in stockpiling of the IC or even eventually outsource and sell it through other channels. In addition, thanks to the lessons generated in the SDP for Nespresso, the compliance with new certifications and consequently the development of new SDP in parallel has been less complicated and, with this, the trader is broadening and diversifying its quality coffee market.

However, a structural weakness of the SDP was the absence of a BL from the IC, as well as the definition of indicators to monitor performance metrics that guarantee quantitatively the advances of the scheme. This made the accountability of the SDP inside the IC itself difficult, and with those involved in their surroundings. Likewise, a scarce foresight about the increase in volume stockpiled led to the presence of bottle necks in stockpiling. Because of this, the capacity for stockpiling and storage is an aspect the attention of which requires commitment and resource allotment from the buyer (Saghiri and Wilding, 2021).

CONCLUSIONS

This analysis shows a successful Supplier Development Program that gives access to demanding and solvent markets to small-scale coffee producers, through sustainable production systems; this achieves important benefits for them and for the trailblazing company that manages the program. The fundamental role of the trailblazing company stands out, since there must be knowledge, infrastructure, and a network of commercial relationships that give access to niche markets that value the attributes of the production to develop with the producers.

In addition, Supplier Development Programs require managing a more complex and costly supply chain. Therefore, the trailblazing company must have capacity and willingness to invest resources with a medium-term vision to comply with the required standards of quality and also to improve the productivity and sustainability of the producers. The trailblazing company must also have the capacity of structuring and coordinating a cooperation network with the producers and other agents that complement the activity with adequate governance, clear rules and sufficient incentives for all participants.

Lastly, the implementation of the program emerged as consequence of the consumption needs, interested in gaining access to a quality product, with social and environmental responsibility; however, the economic impact shown is one of the reasons why it has been maintained for more than ten years.

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