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## Abstract\*

Since the early nineteenth century, cacao has been an important export earner for Ecuador. Today the importance of this sector remains, as Ecuador is the main producer and exporter of Fine and Flavor cacao worldwide. Motivated by the main transformations of the global food systems and the increasing demand for multidimensional credence attributes, this study examines the present state of Ecuador's cacao industry, identifies areas of opportunity, and discusses how the private and public sectors can work together to meet existing and emerging challenges. Findings are supported by interviews conducted with the principal actors in the Ecuadorian cacao industry and two case studies. The first case study focuses on how associativity can help cacao farmers producing high-quality beans to differentiate themselves and succeed in modern agri-food markets. The second case study explores the success of a local chocolate firm and its links with local cacao farmers. Findings suggest that market trends have created new business opportunities for cacao producers and chocolate processors. These opportunities are most open to firms who can personalize and differentiate their products, for example, through the use of quality certifications such as organic, fair trade, reduced carbon load, etc. More importantly, market developments are driving exporters to enhance the performance of cacao value chains in the country, but the sector requires coordination to capture reputation and credence-based demands for the local cacao.

**JEL classifications:** D4, L1, M38, O12, Q01, Q12, Q13

**Keywords:** Agroindustry, Exports, Value chain, Credence attributes

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\* This paper was undertaken as part of the IDB and IDB Invest project "Private and Public Strategies for Success in Modern Agri-Food Markets." Primary information for this study was collected through interviews of actors in the Ecuadorian cacao industry during spring and summer 2020. Interviews included leaders of: i) local cacao producers' associations including Corporación Fortaleza del Valle, Wiñak, and Kallari; ii) local chocolate processing firms including Tulicorp and Pacari; iii) public institutions and local universities including the Agency for the Regulation and Control of Plant and Animal Health (AGROCALIDAD), the Ministry of Agriculture and Livestock (MAG), and Escuela Superior Politécnica del Litoral ESPOL; and iv) the National Association of Cacao Exporters ANECACAO. In addition, two focus groups were also conducted with producers from the associations Wiñak and Kallari, both located in the Ecuadorian Amazon rainforest.

## 1. Introduction

Cacao (*Teobroma cacao L.*) has been an important export of Ecuador since the early nineteenth century, when a large production and export industry was established (Vasallo, 2015). In the twentieth century, the relative importance of cacao to the national economy declined as bananas, and later oil, supplanted it, but real values of cacao exports continued to grow. Today, cacao remains an important export earner, in raw form and as chocolate and other cacao-based products (Figure 1), and it is among the three largest export earners for Ecuador. In addition to its importance as a foreign exchange earner, cacao production occurs in 21 of 24 provinces and provides livelihoods to some 100,000 producers, 85 percent of whom cultivate less than 10 hectares (Radi and Martínez, 2008). National statistics show that 501,285 hectares are planted exclusively to cacao and approximately 72,500 additional are planted in association with other crops (INEC-ESPAC, 2019).

Cacao production and marketing is determined in part by an important attribute of cacao—it is a perennial product. Producing trees live for as much as 40-50 years, with production beginning only 3-5 years after the plant is established, and management of traditional varieties follows long traditions and family-adopted processes (Wood and Lass, 2001). Two varieties dominate the landscape in Ecuador, the traditional *Nacional* variety—recognized in international markets as a high-value product with unique flavor and aroma attributes (Cacao Fino de Aroma)—and *CCN-51* (Coleccion Castro Naranja 51), a recently introduced high-yielding hybrid variety that is also resistant to key cacao diseases.<sup>1</sup>

The global chocolate market is expected to grow by \$41.15 billion during 2020-2024. (Technavia, 2020). This growth is accompanied by one of the main transformations of the global chocolate industry—the recent increase in demand for multidimensional credence attributes which include desire for organic production, fair trade, environmentally sustainable production processes, craft and healthy chocolate products, and region of denomination.

This shift in consumers' preferences is revolutionizing global cacao systems and has triggered traders and chocolate processors to i) pay more attention and care to the quality of the cacao beans, i.e. through the use of traceability systems; and ii) focus on the differentiation of their

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<sup>1</sup> *CCN-51* is preferred by the local cacao processing industry for the manufacture of mass consumption chocolate products. It is considered to be part of the *Trinitario* variety family and does not have the taste and smell of Cacao Arriba, which is most highly demanded in international markets (Vasallo, 2015).

products by offering higher-quality chocolates. It is incumbent that the Ecuadorian industry adjust to these changes. In fact, adjustments have occurred, but the transformation is incomplete; the local industry in Ecuador is still characterized by relatively antiquated post-harvest processing and marketing complexes, and the result is that the value promised by the global market's evolution is being squandered.

This study examines the present state of Ecuador's cacao industry, identifies areas of opportunity, and discusses how the private and public sectors can work together to meet existing and emerging challenges. Findings suggest that market trends have created new business opportunities for both cacao producers and chocolate processors. These opportunities appear to be especially available for those who can personalize and differentiate their products, for example, through the use of quality certifications such as organic, fair trade, reduced carbon load, etc. Findings also suggest that market developments are driving exporters to enhance the performance of cacao value chains in the country.

The remainder of this paper is organized as follows. Section 2 discusses the present state of the industry and its recent evolution, with a special emphasis on production and exports. The role of the public and private sector is also discussed in this section. Sections 3 and 4 present two alternative case studies that illustrate the potential to exploit unique opportunities presented by the global transformation. The first study focuses on how associativity can help cacao farmers producing high-quality beans to differentiate themselves and succeed in modern agri-food markets. The second case study explores the success of a local chocolate firm and its links with local cacao farmers. Both studies illustrate and discuss several of the strategies adopted by the actors. These strategies are complemented by a discussion of the role of some of the key public goods necessary to facilitate these processes. The effect of the COVID-19 pandemic is also discussed. In Section 5, current and future challenges for the industry are discussed, along with the role of the public and private sectors in facilitating a market-driven modernization of the entire production/marketing/processing environment.

## **2. The State of Ecuador's Cacao Industry**

### ***2.1 Overview***

Among traditional non-oil exports, the cacao value chain was the third most relevant after bananas and shrimp during 2019. During the last 15 years, Ecuadorian exports of cacao beans increased

more than 460 percent, from around 117 million USD in 2005 to 657 million USD today (Figure 1), an increase of around 235 percent (from 80,000 tons in 2005 to 270,000 tons today).

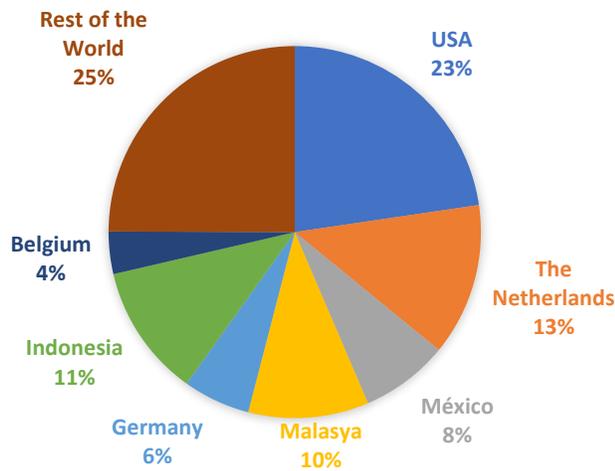
**Figure 1. Ecuador: Cacao Exports, 2005-2019**



*Data source: Central Bank of Ecuador (2020).*

Main destinations for Ecuadorian cacao exports include the United States (main importer), followed by the Netherlands, Indonesia, Malaysia, Mexico, Germany and Belgium (Figure 2).

**Figure 2. Ecuador: Cacao Exports Destinations, 2015-2019**



*Data source: Central Bank of Ecuador (2020).*

This sustained growth in cacao production and exports has been influenced by growth in the demand for chocolate and other cacao by-products worldwide, especially by emerging markets such as China, India, and Brazil. Expansion of cacao production in Ecuador has occurred throughout the country, especially in the coastal provinces that have the particular agroecological conditions for cacao growth and its optimal development.

About 90 percent, of Ecuador's cacao beans are exported and processed overseas, while only 10 percent stays in the country. Out of that 10 percent, only 1 percent are transformed into chocolate products by local firms; the rest are used for the manufacture of semi-processed products such as cacao liquor, cacao butter, cacao paste, and cacao powder, some of which are exported and some consumed locally (ESPOL, 2016).

In aggregate terms, cacao production generates around 600,000 direct jobs, and it is an important source of income in many provinces (ESPOL, 2016). However, these estimates are conservative, as they do not account for the temporary jobs generated by harvest and post-harvest activities. They also do not account for service-related jobs in the value chain such as transportation and distribution activities (ESPOL, 2016).

## ***2.2 The Cacao Value Chain in Ecuador***

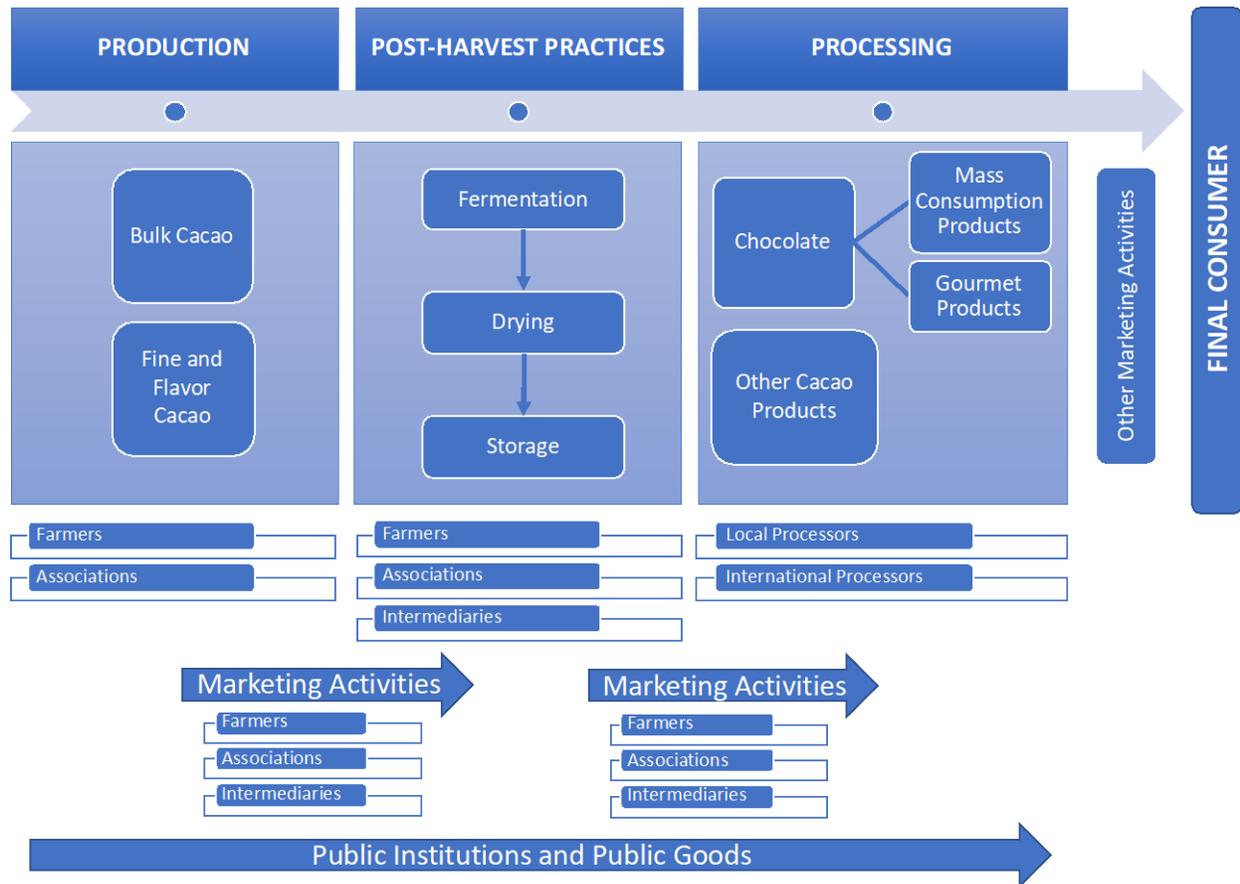
Figure 3 represents the value chain of cacao in Ecuador. The main activities of the value chain that represent the “from bean to bar” journey include i) bean production, ii) post-harvest practices and iii) the processing and manufacturing of chocolate and other products. Along these different activities there is an involvement of numerous actors including farmers, associations, intermediaries, and processors. The cacao value chain in Ecuador reflects a high involvement of intermediaries who carry out marketing activities including transportation, storage, and commercialization; in some cases, they even perform the post-harvest practices of fermentation and drying. Estimates of the number of cacao intermediaries in Ecuador range from around 400 to 1,000 entities (Radi and Ramírez, 2006).

### ***2.2.1 Production***

An important advantage of Ecuadorian cacao is its great diversity and varietal richness. This is associated with Ecuador's heritage and genetic resources, since the country is considered as the center of genetic and geographical origin of the *Nacional* variety (Loor et al., 2009). Additionally,

Ecuador has ideal agroecological conditions for production, which have helped offset shortcomings in its production systems.

**Figure 3. Cacao Value Chains in Ecuador**



Source: Authors' compilation.

Historically, Ecuador has based its production on the type of cacao known as Fine and Flavor cacao, also known as *Nacional* cacao. Worldwide, Fine and Flavor cacao represents between 6 percent to 8 percent of total production, and Ecuador is its main producer and exporter (ICCO, 2015). The gourmet characteristics in the flavor and aroma differentiates Ecuador from its African peers, who mostly produce ordinary or bulk cacao beans. In addition, and from a development point of view, problems associated with deforestation and child labor<sup>2</sup> have not been reported in Ecuador's production systems (ANECACAO, 2020; Brack, 2019).

<sup>2</sup> A recent study estimated that the willingness to pay for chocolate labeled as "child-labor-free" in Belgium, France, the United Kingdom, and the United States exceeds the 2.81 percent price premium farmers need to eliminate

It is estimated that 90 percent of *Nacional* cacao is produced in small traditional plantations of less than 2 hectares, and with little or no use of appropriate technologies. The presence of many old plantations and a low resistance to diseases are other main deficiencies, especially for producers of the *Nacional* variety. Witches' broom (*Moniliophthora perniciosa*) and frosty pod rot (*Moniliophthora roreri*)—the most important phytosanitary constraints to production (CacaoNet, 2012)—are managed in *Nacional* production through IPM practices such as removing diseased pods and infected branches, and careful pruning to allow airflow.

The recently introduced CCN-51 variety is used by farms with larger areas, employing modern technologies, which results in productivity levels that are more than twice the national average<sup>3</sup> yield of 0.47 tons/ha (Amores et al., 2010; FAOSTAT 2020). CCN-51 (Colección Castro Naranjal 51) is a cloned cacao of Ecuadorian origin that was developed by the private sector with the aim of offering producers a variety with more resistance to frosty pod and witches' broom fungal diseases. CCN-51 has been widely adopted and has helped increase cacao production in Ecuador.<sup>4</sup> CCN-51 is considered as an ordinary or bulk cacao variety, nonetheless, it presents different advantages in terms of yields,<sup>5</sup> age of productive maturity,<sup>6</sup> and resistance to diseases when compared to *Nacional*. In addition to their yield differences and susceptibility to diseases, plantation management varies for the *Nacional* and CCN-51 varieties. *Nacional* plantations tend to be far older and the trees are taller (as much as 10 meters in height) and broader than CCN-51 (Barrera et al., 2019).

The higher productivity of CCN-51 and growing international demand for cacao have led to a significant increase in area planted and production of this variety. Nonetheless, its flavor and aroma characteristics means CCN-51 is considered to be of lower quality compared to *Nacional* (Castillo, 2013). Interestingly, this difference in quality does not always translate to better prices for the *Nacional* variety. Some factors that influence the price received by cacao producers include

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hazardous forms of child labor in cacao-producing countries in Africa (Luckstead et al., 2021). Since all of Ecuador's cacao is produced "child-labor-free," this type of price premium should accrue to Ecuadorian producers by default.

<sup>3</sup> Globally, Ecuador ranks 19th in terms of cacao productivity (FAOSTAT, 2020).

<sup>4</sup> After the El Niño phenomenon of 1998, cacao plantations in Ecuador were severely affected by fungal diseases that decimated cacao production.

<sup>5</sup> Productivity of CCN-51 has been estimated to be 0.65 tons/ha, while productivity of *Nacional* has been estimated to be about 0.33 tons/ha. (Barrera et al., 2019). Studies have shown that the CCN-51 variety produces more than *Nacional*, especially under conditions of limited input use (Castillo, 2013; Barrera et al., 2019).

<sup>6</sup> CCN-51 trees start the production of pods and beans at a younger age than *Nacional* trees (Barrera et al., 2019).

the market structure and high presence of intermediaries, the use of different marketing channels, volumes, transaction costs, and the varied application of post-harvest practices.

The limited influence of small farmers over these market challenges has disincentivized investment in maintenance and renovation of cacao plantations, especially among producers of *Nacional*. Due to these difficulties, it is estimated that CCN-51 area will continue to expand nationwide, which in turn may affect productivity and the perceived quality of the aroma and flavor of Ecuadorian beans. By type of variety, ANECACAO (2020) estimates that, in 2019, 30 percent of total exports corresponded to the CCN-51 variety; 47 percent corresponded to the “lower quality” *Nacional* variety also called *Arriba Superior Epoca*—mainly shipped to the United States; and 23 percent corresponded to the “higher quality” *Nacional* variety also called *Nacional Arriba*—mainly shipped to Europe and Japan<sup>7</sup>.

### 2.2.2 Post-Harvest Practices

After cacao beans are harvested, they are fermented and dried before storage and shipment to processors. Farmers can sell their beans in a wet condition,<sup>8</sup> and in such cases the buyers (associations, warehouses, intermediaries, etc.) carry out these post-harvest practices.

Fermentation time differs among the *Nacional* and CCN-51 varieties,<sup>9</sup> and the most common methods involve use of wooden boxes and heaps of leaves. Throughout the process it is also recommended to move the beans constantly to reach a homogenous fermentation of the beans. Bean drying reduces moisture to about 7 percent to facilitate storage and transportation. This process is normally done using sun drying and cement floors, and although the time it takes depends on the intensity of the sun's rays, it usually takes six to 10 days. In Ecuador, both of these practices are normally performed on the farm by farmers.

These two processes are key for the development of the flavor and aroma of the beans, two features that gourmet markets highly value. Poor application of these post-harvest practices can ruin bean flavor and aroma. Factors contributing to poor post-harvest practices include limited access to technology and capital and lack of training on post-harvest management. These problems

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<sup>7</sup> *Arriba Superior Epoca* and *Nacional Arriba* are both considered to be of superior quality and receive higher prices when compared to CCN-51 (ANECACAO, 2020).

<sup>8</sup> This wet condition—when the beans are covered by a white layer, right after being removed from their pods—is also known in Ecuador as “*en baba*.”

<sup>9</sup> Fermentation time recommendations is four days for cacao *Nacional* and six days for cacao CCN-51.

are common among smallholder farmers in Ecuador, and many who do not have access to cement floors dry their beans on the side of highways, where smoke and unpredictable rains affect quality.

A recent study estimated that around 60 percent of cacao farmers in Manabí province ferment and dry their beans on-farm. None store beans, instead selling them immediately after drying (Barrera et al., 2019). Drying is done primarily on cement (38 percent) and wood floors (34 percent), and the remainder is done using plastic floors or the sides of the highways. Barrera et al. (2019) also found that intermediaries performed all of these post-harvest practices to some extent, but none of them used a quality control system. Differentiated by the type of variety produced, this study found that CCN-51 producers are more likely to ferment and dry their cacao beans, but *Nacional* producers are more aware of factors affecting bean quality.

In contrast to Ghana and Ivory Coast, there is no seasonality for cacao production in Ecuador, hence there are no clear price fluctuations within the year; local prices in Ecuador instead follow the New York and London futures price (Villacis et al., 2019). This further incentivizes farmers to sell their beans right after post-harvest processing, as there are no clear price advantages to storing the beans.

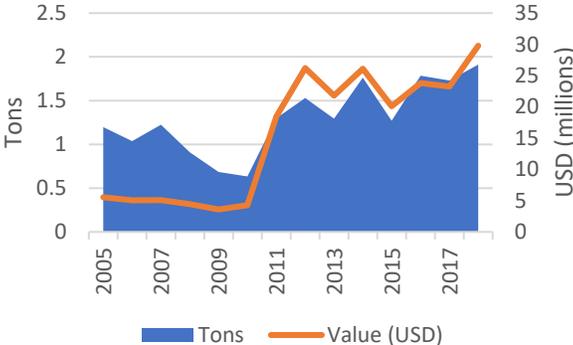
### *2.2.3 The Local Processing Industry*

Processing companies use fermented and dried cacao beans to manufacture chocolate and other products. Consumption in Ecuador and Latin America in general is very low compared to countries such as Switzerland, Germany and the United Kingdom. The Ecuadorian processing industry has, however, grown recently. Local brands such as Pacari, Kallari, Caoni, República del Cacao, etc., differ from the classic market approach of supplying raw material. They instead focus on generating and retaining value added. Most have responded to evolving consumer preferences and produce high-quality or gourmet chocolates. Organic and fair-trade certifications are now common attributes of these products, which are being exported to international markets.

Between 2005 and 2018, Ecuadorian chocolate export values increased more than 430 percent, from around 5.5 million USD in 2005 to almost 30 million in 2018 (Figure 4). This represented an increase of exported chocolate of around 60 percent (from 1.19 thousand tons in 2005 to 1.91 thousand tons in 2018). Main destinations for chocolate exports included Brazil, followed by other important markets such as Colombia, the United States, Chile, the Netherlands and Peru (Figure 5). A historical comparison of the price received by the exports of cacao beans

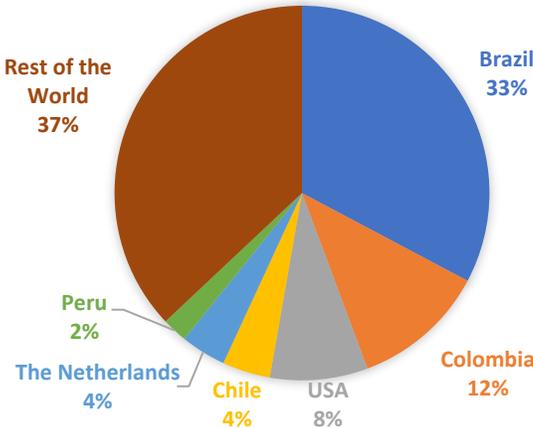
versus the price received by the exports of chocolate during the last 15 years is presented in Figure 6. The difference between these prices reflects a measure of the value added obtained by chocolate processors. It also reflects improvement in the quality and a stronger focus on production of gourmet products by the local industry over the last decades. Pacari chocolates started exporting in 2007, and other gourmet chocolate producers have joined them since then. According to industry experts, on average, the sale of a ton of chocolate generates more than five times the net income generated by the sale of dried cacao beans.

**Figure 4. Ecuador: Chocolate Exports, 2005-2018**



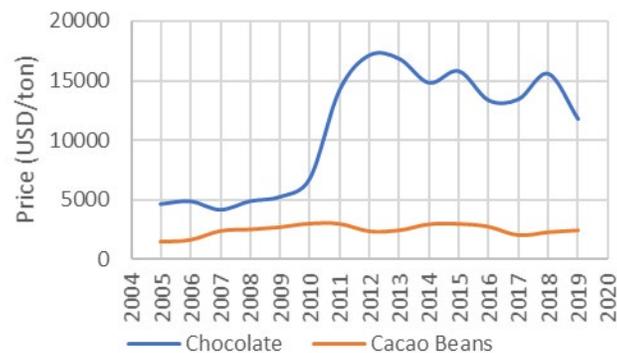
Data source: Central Bank of Ecuador (2020).

**Figure 5. Ecuador: Chocolate Exports Destinations, 2015-2018**



Data source: Central Bank of Ecuador (2020).

**Figure 6. Ecuador: Historical Prices of Cacao Beans and Chocolate (FOB), 2005-2019**



Data source: Central Bank of Ecuador (2020).

#### 2.2.4 Public Institutions and Public Goods

The strong performance of the cacao industry and its exports in recent decades is attributed to private sector efforts accompanied by key public policies and goods that have facilitated the development of this Ecuadorian industry. Since 2012, the National Government through the Ministry of Agriculture (MAG) has financed and promoted a program called “Project for the Reactivation of Coffee and Fine and Flavor National Cacao (PRCC).” The PRCC focused on two activities to increase productivity: i) rehabilitation of *Nacional* cacao farms through pruning aging plantations, and ii) free provision of certified plants for new plantations. Between 2013 and 2016, rehabilitation through pruning occurred on about 160,865 hectares and involved 55,299 producers, impacting approximately 46 percent of all cacao *Nacional* producers (MAG, 2017). Almost 10 million seedlings were donated to cover approximately 14,000 hectares of new *Nacional* cacao plantations (MAG, 2017). The strategy also included provision of agricultural input kits and training on phytosanitary controls. The input kits contained conventional fertilizers and fungicide treatments. Training consisted of removing diseased materials and pruning techniques to improve plantation ventilation and minimize spread of fungal diseases.

Other important public entities promoting development of the industry include the National Institute for Agricultural Research (INIAP) and the Agency for the Regulation and Control of Plant and Animal Health (AGROCALIDAD). Since 1940, INIAP—through its “Cacao Research National Program”—has generated new high-yielding *Nacional* cacao varieties and has promoted technologies for i) integrated pest management for cacao and ii) improvement of post-harvest practices. In the last two decades, INIAP’s development of new cacao varieties has focused on

improving resistance to common cacao diseases found in Ecuador after the El Niño phenomenon: witch's broom and frosty pod. INIAP's latest cacao program efforts have developed clones resulting from crossing Nacional and CCN-51 varieties with the objective of obtaining plant materials that combine high productivity with fine flavor and aroma. Results of this research led in 2016 to the release of two clones—INIAP-EETP-800 AROMA and INIAP-EET-801 FINO—with promising yield potentials that vary between 2.4 to 3.0 tons of cacao beans per hectare per year. According to INIAP's estimates, at least 10,000 cacao-producing families in Ecuador currently use vegetative material developed by INIAP.

AGROCALIDAD supervises quality control in the cacao value chain. This entity is in charge of regulating and enforcing procedures for: i) registration and certification of cacao collection centers and warehouses, ii) registration and certification of nurseries and producers of cacao *Nacional* plant materials, iii) phytosanitary inspections (mandatory fumigation applications) of lots of cacao beans destined for exports, and iv) various quality certifications of cacao destined for exports, e.g., organic certification. During 2018 and 2019, AGROCALIDAD performed 4,020 and 3,170 phytosanitary inspections respectively, leading to the respective certification of 3,972 and 3,151 cacao lots for export. Approximately 80 percent of these certifications are for *Nacional* cacao. AGROCALIDAD also publishes the “Good Agricultural Practices Guide for Cacao,” which outlines technical procedures and specifications that must be considered at all stages of the production process. This guide aims at promoting food safety, protection of the natural environment and people employed on farms, and the sustainable management of inputs, ensuring the health of cacao beans at all stages of production.

Although in a more limited way, Ban Ecuador (the public Development Bank, formerly known as Banco *Nacional* de Fomento) and the Institute for the Promotion of Exports and Investments of Ecuador (PRO ECUADOR), are public institutions that have contributed to the development of Ecuador's cacao sector. It is estimated that during 2013-2017, Ban Ecuador carried out bank operations and services related to the cacao sector for a total amount of approximately 68 million USD (MAG, 2017). Similarly, PRO ECUADOR has helped by opening new markets for Ecuadorian exports and inviting cacao producers and chocolate processors to participate in international fairs.

### **3. Associativity, Credence Attributes, and Quality Control as Keys to Success in the Cacao Value Chain: The Case of Corporación Fortaleza del Valle**

*Corporación Fortaleza del Valle* (CFV) is a farmers' association that produces, stores and markets fine and flavor cacao beans, with organic, fair trade, and designation of origin certifications. Its origin is linked with the national government investment in 2005 in construction of a dam in Manabi called "La Esperanza." The dam provides irrigation to 13,000 hectares of land, and benefited, among others, cacao producers. Two cacao organizations, "Fortaleza" and "Valle del Carrizal," merged to take advantage of the new irrigation systems and formed CFV with 60 members. CFV was officially founded in 2006, and it is currently comprised of four agricultural cooperatives and about 1,000 members. CFV covers a total area of around 17,000 hectares of agroforestry systems. Of the total area, it is estimated that only 2,000 hectares are used to produce Fine and Flavor organic cacao. According to its founders, the main motivation behind the establishment of CFV was the lack of available commercialization channels in the production areas of its members. This caused farmers to face high transportation costs and/or experience price discrimination from intermediaries.<sup>10</sup>

Since its foundation, CFV has received support from local public entities as well as from NGOs and other international cooperation agencies such as ACDI/VOCA and the Union of Cacao Farmers Organizations of Ecuador (UNOCACE). In 2006 CFV received support from Nestlé and the Ecuadorian Private Corporation for the Promotion of Exports and Investments (CORPEI)—a private non-profit institution—to establish their business operations. Later in 2009, the German Technical Cooperation GTZ helped CFV to participate in international fairs to market their products outside of Ecuador. During the last decade, the national government has also encouraged and financed the organization's participation in international events, mainly at fairs in the United States and Europe. CFV has additionally received financial support from Rabobank of the Netherlands to increase its production.

Several factors contribute to the success of CFV in modern cacao value chains. These include i) the use of production systems that a) are focused on meeting the increasing demand for credence attributes and that b) supply markets of gourmet chocolates; ii) a quality control system for post-harvest fermentation and drying that helps ensure high-quality end products; and iii) a

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<sup>10</sup> According to Barrera et al. (2019), this situation is common in Manabí among small-scale cacao producers who are not associated.

management strategy with strong leadership that helps attain economies of scale and tackle market failures frequently found in the food value chains of developing countries.

The exclusive production of fine and flavor cacao has positioned CFV as a supplier of high-quality cacao beans in the niche market of gourmet chocolates. The demand for this type of chocolates has been increasing during the last decades and CFV has fewer competitors in this niche market, especially compared to markets for ordinary or bulk cacao beans. Also, producing under an organic and agroforestry system gives CFV a competitive advantage in the markets, as it can promote its production as i) environmentally friendly and ii) contributing to the conservation of biodiversity. In addition, CFV's use of contract farming positions it as socially responsible while helping with the economic development of its members. As previously discussed, these are qualities that are highly valued among consumers and the current rising demand for credence attributes. The benefits of these features are exploited by CFV through the use of various certifications, which are rewarded with larger price premia by buyers and the market.

It is common for farmers with limited access to technology, training, and capital to forfeit these advantages by performing post-harvest practices without adequate quality control. By controlling post-harvest processing, CFV ensures a high and homogenous quality of its cacao. This part of the cacao value chain is key for developing the aromas and flavor of the cacao beans.

Exploitation of demand for credence attributes and the application of strict quality controls during post-harvest practices are made possible by the associativity feature of CFV. Large operation volumes have helped CFV achieve economies of scale, increase its market power, and eliminate use of intermediaries along the cacao value chain. These are common barriers that exist along food value chains in developing countries, and finding ways to overcome them has helped CFV increase the benefit margins from cacao production for its members. Next, we discuss the CFV business model and how it has helped them succeed in the cacao value chain.

### ***3.1 Business Model***

The CFV business model is based on i) using certifications and providing technical assistance to members, ii) buying cacao beans prior to fermentation and drying, iii) application of post-harvest practices under strict quality controls, and iv) use of direct market channels.

### *3.1.1 Using Certifications and Providing Technical Assistance*

Certification is carried out by international agents since the organization has the contacts that facilitate these processes. CFV offers Fine and Flavor organic cacao with BIOSUISSE and USDA organic certifications. These two certifications are administered by ECOCERT. These certifications cost, on average, 8,500 USD per year for organic certification for all members. According to CFV managers, on top of the associated price premiums related to organic production, certifications add an additional price premium of 300 USD per ton of organic cacao. CFV members also have the Fairtrade Certification administered by FLO-CERT. With the fair-trade price premiums, CFV provides its members a Christmas bonus and covers the costs of provision of technical assistance, interest-free credits, information, and four free days of labor for pruning activities. Costs of all certifications are paid by CFV; producers repay these expenses when they sell to the cooperative.

CFV has field inspectors who regularly visit cacao plantations and provide technical assistance and training to members. Training focuses on organic production using quality standards imposed by AGROCALIDAD. Training also focuses on standards for other certifications and requirements from countries where beans are sold. The organization additionally trains on pruning practices, pest and disease control, manure management, composting, crop rotations, and crop management in agroforestry systems. CFV further provides members tools such as scissors, machetes, and organic inputs, among others.

### *3.1.2 Buying the Cacao Beans Prior to Fermentation and Drying*

CFV buys cacao beans immediately after harvest—that is, prior to fermentation. For these acquisitions, CFV prioritizes its legal members and makes use of purchase contracts. This has further implications for its members, as participation in contract farming helps CFV producers increase their welfare by minimizing exposure to price fluctuations and by motivating reinvestment in their operations.<sup>11</sup> Members are allowed to sell their cacao beans to other buyers or intermediaries, but this practice is uncommon since prices paid by intermediaries are generally lower.

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<sup>11</sup> See more about implications related to contract farming in Barrett et al. (2012).

Members of CFV enjoy higher prices than they could receive from intermediaries. According to Berto Zambrano, Executive Director of the Corporation, and members of CFV interviewed during 2020, for example, when intermediaries paid 30 USD per quintal, CFV paid 48 USD per quintal to its members. This is possible due to the direct relationship with buyers, which eliminates intermediaries and their profit share. Large sale volumes also help them negotiate better premiums for organic beans, something that is not possible with small volumes. The price is agreed upon directly with members after subtracting operational (transportation, storage, post-harvest, certifications, etc.) and administrative costs. Since CFV markets directly with international clients, compliance with purchase contracts is part of its marketing strategy and is linked with the increasing demand for credence attributes. According to the CFV statutes, and because its operation is dedicated exclusively to organic cacao, there are sanctions and cancellation of purchase contracts for members using inorganic products. Use of purchase contracts also helps CFV enforce quality control. The organization additionally buys cacao beans from organic-certified non-members.

Cacao collection began in a single storage center, but due to its rapid growth, CFV now has two collection centers: *Centro de Calceta* and *Membrillo-Quiroga*. Although CFV does not control for the chemical composition of its cacao, it uses a database system containing information on the historical area and average production of each member. In combination with field monitoring, this system helps CFV verify any irregularities in its members' production. This mechanism is also used to control for potential scams from members trying to sell beans that were not produced by them and to comply with the organic verification and traceability standards required by the certifiers. Currently, cacao traceability systems are limited in Ecuador, and only beans produced under certification schemes have some degree of traceability. In the CFV context, traceability efforts can be seen as an unintended consequence caused by the mandatory adoption of certifications imposed by CFV on members.

### *3.1.3 Performing Post-Harvest Practices Under Strict Quality Controls*

By buying the cacao beans prior to fermentation and drying, CFV ensures the correct application of post-harvest practices. The fermentation and drying follow AGROCALIDAD and other specific requirements. This helps CFV guarantee a homogeneous post-harvest process, and it is key for ensuring a good aroma and flavor of its cacao. It also allows CFV to customize fermentation and

drying for buyers. Many of these send interns to CFV to learn about the CFV business model and verify all the cacao production and post-harvest processes.

### *3.1.4 Using Direct Market Channels*

Since CFV manages large volumes of organic cacao, it is possible to use direct long-term sales contracts with international buyers. According to its founders, business relations with some clients go back 12 years or more and are the result of the recognition of the high-quality product they are able to offer in exportable volumes throughout the year. The organization sells most of its product to clients in Switzerland, which accounts for up to 80 percent of its sales. CFV also sells to clients in the United States (10 percent) and the Czech Republic (5 percent%); the remaining 5% is distributed among clients in Germany, Italy, France and the local market. CFV total annual sales of organic cacao amount to approximately 600 tons, at a value of 4,730 USD per ton. These sales generate a gross annual income of about 2.83 million USD, which fluctuates with international market prices.

### *3.2 COVID-19 and Its Impact*

According to its members, the pandemic caused by COVID-19 has not affected their production. Likewise, commercialization has not been affected, since the organization has honored contracts and prices established in the contracts. It is important to indicate that cacao prices at the international level did not decrease during 2020, and the organization has easily maintained prices to its producers. When consulted, members indicated that during 2020 they have been able to sell even larger quantities of cacao to the organization. However, according to Berto Zambrano, Executive Director of the Corporation, this has not been the case for non-members.

## **4. From Bean to Bar to the Top of the Cacao Value Chain: The Case of Pacari Chocolates**

### *4.1 Overview*

Growing demand for credence attributes in chocolate markets has fueled the development of bean-to-bar chocolate manufacturers. These companies differentiate themselves from other chocolate producers by controlling the chocolate-making process from the farm to the bar and claim that in this way they can create products that preserve distinctives flavors and aromas. In addition to improving the quality of chocolates, these companies advertise the credence attributes of their

products, including improvement of working conditions of their suppliers and their positive environmental impacts via the use of sustainable production methods.

Pacari chocolates is a family-owned company and the first Ecuadorian bean-to-bar chocolate company. Pacari means “nature” in Quechua—the native language in the Ecuadorian Andes. Their products have been remarkably successful during the last decade and are becoming increasingly available in chocolate outlets throughout Europe, the United States, South America and Asia.

Santiago Peralta and Carla Barbotó founded Pacari Chocolates in 2002, and in just six years they began exporting and positioning their brand in international markets. Initially, Pacari processed basic cacao products (butter and powder), but they soon changed their focus toward production of chocolates. *“When we started, we had no idea about chocolates, ..., it was trial and error what we did with Santiago. We went looking for cacao, we went looking for farmers who wanted to be certified organic, farmers who have good harvest and post-harvest processes, and farmers who could provide us with a quality product. After that, our knowledge of chocolate combined with the local Ecuadorian talent, was what we really developed and this ended in a premium chocolate”* (Carla Barbotó, 2019)

Pacari began operations with just five employees using its own resources. Due to rapid growth and success, the company currently employs more than 85 people and finances operations with loans from local and international banks. Throughout its development, Pacari has received support from public entities such as PROECUADOR, who helped open markets, mainly by inviting Pacari to participate in international fairs.

Nowadays, Pacari produces more than 100 different chocolate products and manufactures more than five million chocolate bars per year. About 50 percent of these are sold internationally and the other 50 percent nationally. According to its founders, Pacari products entered and succeeded in international markets before entering the Ecuadorian market. In addition, part of the motivation for the existence of Pacari comes from the fact that Ecuador produces 60 percent of all Fine and Flavor cacao worldwide, but only 10 percent of its production is processed locally. With respect to this, Santiago Peralta mentions *“cacao producers have no idea of the value added that can be given to cacao, and the benefits that this could bring them, ..., if producers were able to establish more chocolate-making companies, the millions of dollars that foreign chocolate*

*companies generate with Ecuadorian cacao would stay in the country, creating jobs and fostering a local chocolate industry.”*

Factors contributing to the success of Pacari chocolates in modern cacao value chains resemble those of CFV. These include i) use of processing systems focused on a) meeting the increasing demand for credence attributes and on b) supplying gourmet chocolate markets, ii) careful attention to post-harvest practices to ensure good aroma and flavor of their cacao beans, and iii) a management style that strives for innovation, constantly seeking to develop new products.

Pacari produces chocolate bars with prices starting at 3 USD, and their yearly gross sales fluctuate between 15 to 20 million USD. Pacari products are made exclusively with organic Fine and Flavor cacao and have won over 300 international chocolate awards. Pacari works directly with more than 3,500 small-scale farmers in the Ecuadorian Amazon and coastal regions. These farmers are direct suppliers of organic cacao beans, and the company provides them purchases contracts and training in sustainable production practices. Their chocolate products are marketed with organic, fair trade, vegan, and other certifications. As in the CFV context, traceability efforts related to PACARI can be seen as an unintended consequence caused by the use of certifications used by their suppliers. The production and marketing practices help Pacari promote their gourmet products as socially responsible and environmentally friendly. As previously discussed, these qualities are highly valued among consumers given the current rising demand for credence attributes.

Pacari does not perform post-harvest practices; it buys fermented and dried cacao. Nonetheless, it monitors these processes and provide farmers with training to ensure quality. This helps the company customize the aroma and flavor attributes required for the manufacture of their products. The ideas for the development of these products came directly from their founders, who recognize and emphasize the importance of credence attributes in the gourmet market. Moreover, these ideas have been influenced by the experience of their founders living abroad, including in Peru, Germany, and Portugal. For example, the development of “Organic Chocolate with Lemongrass”—one of Pacari’s most successful chocolate products sold at the local and international level—came as a result of Santiago’s experiences and observing that lemongrass was a common food ingredient all around the world. *“Most of the people has a taste for, and thinks that lemongrass is native to their own countries, ..., lemongrass just simply had different names all over the world including Hierba Luisa, Capim Limão, etc.”*

## ***4.2 Business Model***

The Pacari business model is based on i) working with associations, using certifications, and providing technical assistance to farmers; ii) monitoring and applying strict quality controls for post-harvest processes; and iii) use of direct market channels.

### *4.2.1 Working with Associations, Using Certifications, and Providing Technical Assistance*

Although Pacari also buys cacao beans from individual producers, their business model focuses on working with associations of organic producers. The emphasis on associativity has led Pacari to help with the creation and organization of several producer associations. According to their founders, at least five organizations of organic cacao producers have worked with Pacari since its inception.

Like CFV, Pacari's certifications are conducted by a third-party international agent, and this relationship helps the company strengthen its presence in international markets for organic products. Kiwa BCS Oko-Garantie from Germany provide these services to Pacari. Currently they have seven types of certifications: USDA Organic, EC-BIO-141 Agriculture non-EU, VEGAN, Certified Corporation, NON-GMO, Beyond Fairtrade Small Producers SPP,<sup>12</sup> and DEMETER Certified Biodynamic. As in the case of CFV, the costs of certification are paid by Pacari, and producers pay back these costs through a check-off system.

Because of these certifications, and to exercise quality control, Pacari provides technical assistance on organic and biodynamic agriculture to its producers. Biodynamic agricultural principles constitute one of the company's main philosophies. Pacari has pushed its producers to adopt practices from manure management, composting, crop rotations and use of legumes to wildlife care and the use of medicinal herbs. These philosophies resulted in the launch of a special series of Pacari chocolates in alliance with the World Wildlife Fund (WWF). The use of purchase contracts with farmers helps Pacari with its fair-trade certification and with the promotion of being socially responsible. In most cases, the prices paid by PACARI are twice what intermediaries would pay in the market, one of the main characteristics that attract farmers to working with the company. Producers, representatives, and organizations interviewed for this study—including

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<sup>12</sup> The Small Producers' Symbol, SPP, is an independent and accessible certification system for sustainable production, democratic organization, fair trade and self-management. This label was launched in 2011 by a Latin American co-op collective in partnership with committed buyers in order to value fair trade products from family farming. In contrast to the other fair-trade labels, SPP is focused on smallholder producers and their organizations.

Kallari, Wiñak, and Corporación Fortaleza del Valle—confirmed that prices paid by Pacari were always higher than those offered by local markets, normally being twice and sometimes three times as much.

#### *4.2.2 Monitoring and Applying Strict Quality Controls for Post-Harvest Processes*

Pacari does not ferment and dry beans. Instead, when it enters into a purchase contract, it requires the supplier to follow Pacari's procedures. Pacari provides training on these practices and constantly monitors their application. On top of this, and as an extra quality control step, Pacari is selective in the beans it purchases; selection occurs in its manufacturing facilities in Quito.

#### *4.2.3 Using Direct Market Channels*

Since its beginnings, Pacari focused on reaching markets where chocolate products are already part of consumption habits. The main market has been Europe, but Pacari sells in Asian markets as well. Currently, it sells in 42 countries, including the Netherlands, Spain, China, Germany, Colombia, and Argentina. They entered these markets by negotiating directly with local supermarket chains. This approach has proved to be difficult in the United States, where Pacari has limited market penetration. For the US market they rely on distributors such as UNIFY and KeHE.

The international reach Pacari has achieved is based on a strategy made possible by extensive knowledge of international chocolate markets on the part of its founders, who have lived in several countries where Pacari chocolates are now being commercialized. This has helped them customize their products to the specific tastes of target markets, but more importantly, it provided them with the necessary networks and contacts to establish their first international commercial relationships. This allowed them to bypass the use of intermediaries along the commercialization chain. At the local level, Santiago Peralta has direct contact with the manager of the largest supermarket chain store in the country, "Supermaxi". This has facilitated the commercialization of Pacari's chocolates within the country and has given a boost to the company.

## 5. Current Industry Challenges, Lessons Learned and the Way Forward

### 5.1 Current Industry Challenges

#### 5.1.1 Presence of Cadmium in Cacao Beans and Chocolates

As of January 1, 2019, the European Union (EU) began to apply a new regulation on the maximum levels of cadmium<sup>13</sup> allowed in products derived from cacao (See Table 1). These levels are based on estimates of chocolate consumption by different age groups.

**Table 1. EU Maximum Limits for Cadmium in Cacao Products as of 1 January 2019**

<b>Specific cacao and chocolate products:</b>	<b>Maximum levels of cadmium (mg kg)</b>
Milk chocolate with < 30 % total dry cacao solids	0,10
Chocolate with < 50 % total dry cacao solids; milk chocolate with ≥ 30 % total dry cacao solids	0,30
Chocolate with ≥ 50 % total dry cacao solids	0,80
Cacao powder sold to the final consumer or as an ingredient in sweetened cacao powder sold to the final consumer (drinking chocolate)	0,60

*Source:* Commission Regulation (EU) No 488/2014.

These maximum permitted levels of cadmium only relate to processed cacao products,<sup>14</sup> but controls and guidelines to define the recommended limits for cacao beans are currently under discussion. In general, the cadmium content in cacao beans has been a recurring problem in Latin American and Caribbean countries. This suggests that the new EU regulation will affect exports and therefore cacao producers in the region (Meter et al., 2019).

Producers of Fine and Flavor cacao will potentially be the most affected, since this variety is the one commonly used to make chocolates that contain a high cacao content. Cadmium-contaminated beans from producers of a specific region will create negative externalities and harm other producers who try to differentiate themselves in niche markets using marketing strategies based on product origin. Several public entities in Ecuador such as MAG and AGROCALIDAD have been working toward potential solutions to reduce cadmium levels, but no clear policies have

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<sup>13</sup> Cadmium is a heavy metal from natural origins that has no known function in the human body. Cadmium accumulates in the body and mainly affects the kidneys, but it can also cause bone demineralization. Atmospheric cadmium can weaken the function of the lungs and even lead to cancer.

<sup>14</sup> Limits on cadmium levels in chocolate products have also been put in place in California under the Proposition 65 settlement agreement (February 2018). In California, products that exceed the limits can be sold, but their label must include a warning message.

been established with respect to this issue. The “Cacao Multiagency Platform for Latin America and the Caribbean,” a FONTAGRO sponsored project, is the only known initiative in Ecuador working towards the reduction of cadmium content in cacao beans. This multi-country project, formed by Ecuador (ESPOL & INIAP), Colombia (AGROSAVIA) and Costa Rica (INTA), looks to advance three technological solutions: i) the development of laboratory methodologies (including quality and analytical controls) to identify cadmium; (ii) the development of cadmium maps in the three countries, including in their manufacturing processes; and iii) the development of cadmium mitigation techniques in the field, including fertilization, pest control, and phytosanitary management practices.

Ecuador urgently needs policies to further coordinate actions among actors in the cacao industry. The European Cacao Association (ECA) and Biodiversity International have recommended additional practices to tackle cadmium in cacao. These could be raised at the public policy level and have the potential to reduce the content of cadmium in the soil. These include: i) promotion of management practices to increase pH of acidic soils; ii) constant removal of pruned material, including cacao pods, as their decomposition could release cadmium into the upper soil layers; iii) promotion of cadmium-free fertilizers and manure; iv) avoiding irrigation with cadmium-contaminated water; and v) the use of cacao varieties with low accumulation of cadmium properties.

### *5.1.2 Traceability in the Cacao Value Chain*

Being able to identify the origin of the product and trace it as it moves through value chains is increasingly required by the quality, phytosanitary, and safety standards of international markets. Establishment of a traceability system for cacao is essential if Ecuador wants to improve its competitiveness in the global markets. This is of special importance for the Fine and Flavor cacao sector, since its appreciation in the global markets partially depends on the place of origin.

In Ecuador, public and private entities have tried to promote a traceability system for cacao. To this date, however, a system has not been consolidated, essentially because numerous actors in the value chain operate informally and are difficult to bring into agreements. This is further complicated by limitations of public institutions, which do not have the technical capacity and resources to regulate and control operations among all the actors in the cacao value chain.

According to the National Association of Cacao Exporters (ANECACAO), although several public institutions state that there is a working traceability system for cacao, it does not exist in practice, since there is no control policy, especially in policies to regulate intermediaries. ANECACAO notes that more than 80 percent of the cacao sold in Ecuador passes through hands of intermediaries, and less than half of these intermediaries are formalized, that is, most do not have a Taxpayer Identification Number (RUC), or adequate storage facilities. Lack of regulation causes problems between exporters and the Internal Revenue Service (SRI), since, due to the structure of the market, it is common for exporters to buy from informal intermediaries, who in most cases do not declare taxes. Furthermore, lack of public policies and regulation of intermediaries creates a negative impact on the quality of crops and encourages intermediaries to practice price discrimination on small and more vulnerable farmers.

According to AGROCALIDAD a working traceability system for certified organic production exists, since it is part of standard certification requirements. AGROCALIDAD estimates that 10 to 15 percent of the exported Nacional cacao complies with traceability records, mainly due to requirements imposed by international certifications. The rest of the exported cacao does not have traceability because it comes from intermediaries that commonly mix various types of quality and varieties of beans.

Mixtures of different types of beans, concerns with cadmium, and the interest of farmers in producing and selling high-quality beans are examples of why a functional system of traceability is urgently needed. A functional traceability system could determine exactly where in the cacao value chain cadmium is generated; it also might facilitate mitigation initiatives. A traceability system could help identify actors who mix bean varieties and qualities and provide incentives to reduce that practice.

According to Guilcape (2018) and other actors in the industry we interviewed for this study, a proposal for the implementation of traceability systems should contain at least the following two elements. The first is a design with minimum requirements (according to the guidelines and references of international organizations) that ensures traceability in each of the stages of the value chain and that is fed by the internal processes and systems that each actor performs. The second is the establishment of a public-private partnership that fosters commercial relationships in an orderly manner, that guarantees a reliable control over the value chain, and that links the activities of each institution within the framework of its competences.

### *5.1.3 Organic Certification*

Currently, in Ecuador there are 14140 certified organic cacao producers. Of these, 13,500 belong to 67 groups or associations. Most of these are dedicated to organic production. This signals the importance of associativity in producing economies of scale for certification efforts; it also hints that the very low number of individual farmers obtaining certifications might be related to high costs of certifications. The approximate cost of obtaining an organic certification in an area between 400 to 500 hectares is on average about 20,000 USD per year. For organizations, the cost of certification is normally paid by the organization itself, using the profits generated by the sales of cacao beans in combination with contributions that each producer provides.

AGROCALIDAD, the public institution in charge of regulating this certification in Ecuador, indicates that although these costs are high, they are in line with the international market. However, private actors in the value chain argue that when compared to European certification, the Ecuadorian certification is more expensive and more difficult to obtain. Producers and representatives of organizations point out that a fundamental policy to promote the production of organic cacao in the country would be to change the Ecuadorian norm and normalize it with the European norm. According to private actors, the cacao sector loses several million dollars a year due to difficulties imposed by local organic certification procedures.

Other policies to consider include i) stopping the distribution of agricultural kits containing conventional inputs to organic cacao producers, and instead focusing on ii) subsidizing organic certification and providing technical assistance for obtaining it. This would allow the existence of a greater number of certified organic cacao producers in the country, which will further generate more value added in sales and exports.

### *5.1.4 The Traffic Light System on Chocolate Labels*

The traffic light system is mandatory in the labels of all processed food products commercialized within Ecuador. This system in the labeling of processed food products uses colors to indicate the content of salt, sugar, and fat. Red indicates high content (high alert), yellow indicates medium content (warning), and green indicates low content (zero risk). A low-quality chocolate usually has a low cacao content (less than 5 percent) and a high content of unhealthy fats (e.g., hydrogenated oil). On the other hand, a high-quality chocolate usually has a high content of cacao (e.g., greater than 60 percent), low content of unhealthy fats, and high content of healthy fats,

which are essential for the human body (e.g., oleic acid and linoleic acid). Nonetheless, the traffic light system assigns to both type of chocolates the label of “high fat content.” According to Santiago Peralta (PACARI) and Eduardo Márquez de la Plata (Tulicorp), inadequate application of this system in chocolate products and its inability to distinguish between different types of fats have affected the local chocolate industry, which is mainly dedicated to the production of high-quality chocolates. Although the label does not impact exports—as it is not mandatory for products that will be exported—the designated red label (high alert) discourages consumption of chocolate products in the Ecuadorian market.

Due to this shortcoming, the local chocolate industry advocates for a public policy that corrects the traffic light system on labels, especially for products whose consumption can be beneficial to the human body. In addition, the local chocolate industry can be helped by promoting the consumption of chocolate through i) information campaigns that include adequate scientific support, and ii) the inclusion of national chocolate products in food programs sponsored by the government.

#### *5.1.5 Technology Development and Transfer*

Due to the characteristics of Ecuadorian ecosystems and the current problems in their production systems, the constant development and transfer of cacao varieties is a necessity. Cacao varieties that have desired organoleptic and yield characteristics, and resistance to the most common diseases must continue to be promoted. Research is also needed on practices to reduce cadmium content in cacao. In addition to promoting the use of good agricultural practices—including the efficient use of pruning, fertilization, irrigation, and pest control—it is also important to train producers in correct application of post-harvest practices. Fermentation and drying are key to the formation of the aroma and flavor of cacao beans and can help producers obtain better prices.

#### *5.1.6 New Markets for Cacao Beans and Chocolate Products*

During the last decades, chocolate consumption has increased in non-traditional consuming countries, especially in Asian countries. Demand is also growing for fine chocolate in the Middle East, in countries like Qatar and Saudi Arabia. These countries represent further opportunities waiting to be exploited, and business intelligence and logistics plans will be needed. A limitation related to export of Fine and Flavor cacao relates to gourmet chocolate manufacturers requiring small volumes, which increases transportation costs per unit, and therefore the sale price. At the

other extreme, another limitation is the insufficient exportable amounts of exotic cacao varieties for clients who require a constant supply throughout the year. Thus, it is important to promote the associativity of producers and form farmers' organizations to supply potential new markets with their specific demands. Constant volumes are needed to maintain new markets in the long term.

## ***5.2 Lessons Learned and The Way Forward***

This paper examines Ecuador's cacao industry and identifies clear areas of opportunity. It suggests that the private and public sectors can work together to avail themselves of these opportunities. Findings suggest that global market conditions have created new opportunities for cacao producers and chocolate processors in Ecuador. These opportunities are available for those who can personalize and differentiate their products. Findings also suggest that market requirements are driving exporters to work to improve Ecuador's cacao value chains.

While Ecuador has long been a major player in global cacao networks, its domestic industry, until recently, functioned as a traditional bulk exporter with no quality differentiation. A common sight in cacao-producing areas is the beans being dried on the tarmac on the side of main paved roads. Different varieties are mixed, and little effort is taken to differentiate the product.

The shift in global cacao markets towards promotion of cacao's credence attributes is causing stakeholders to re-examine long-standing value chains. However, imperfect post-harvest processing and weaknesses in the market value chains have prevented producers and the industry as a whole from exploiting these opportunities.

Recent successes of entrepreneurial enterprises have shone a light on these opportunities. The cases presented here highlight efforts to increase quality through better management, certification and consistency in post-harvest processing. These efforts are largely achieved through direct relationships between the processor/exporter and producers. Contracting, training in production methods and promoting cacao producer associations are steps that these enterprises have taken as a means of capturing credence demands in global markets. Through contracting, some of the difficulties of vertical integration are mitigated, but the contracts and associations facilitate *de facto* provenance and lower costs of certification. Pacari has created a network of cacao suppliers which ensures uniform quality and provides fermented and dried beans with the exact attributes the company seeks. It processes its products and markets them directly to

distribution networks in target countries. In contrast, Corporación Fortaleza del Valle ferments and dries the beans purchased from its networks to maintain its quality standards.

The remainder of Ecuador's cacao industry faces challenges to emulate the successes documented here. The bulk export model is becoming less attractive as global markets segregate and traditional producers and exporters face competition from low-wage producers in West Africa and Southeast Asia. The segregated market offers promise, but the sector requires coordination to capture reputation- and credence-based demand for Ecuadorian cacao.

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