

The Cocoa Commodity Chain in the Peruvian and Ecuadorian Amazonia: Similar Industrial Upgrading Processes but Divergent Socio-Environmental Constructions

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Abstract:

Purpose: To analyse the functioning of the Amazonian cocoa commodity chain in Napo (Ecuador) and Tocache (Peru), focusing on the factors that shape its governance and the attempts at its subversion through economic, social and environmental upgrading processes.

Design/methodology/approach: The research focused on the Amazon basin in the provinces of Napo (Ecuador) and Tocache (Peru). A mixed qualitative and quantitative approach was used that considered not only the local scale but also the operation of the national and global cocoa commodity chains.

Findings: Even though the geographical environment in which cocoa is cultivated provides a similar set of stimuli, the starting point and history of cocoa farming in the two countries are dissimilar. The social features of the farmers, the agricultural management systems, the associated income levels and the environmental effects are also very different. In addition, local agents are strongly influenced by starting imbalances in price negotiations and distinct degrees of access to liquid assets. All of these factors have different impacts not only on the quality of the cacao production but also on the socio-environmental effects of the production. In the Ecuadorian Amazon, cocoa is a factor in territorial conservation and Indigenous empowerment, while in the Peruvian Amazon, cocoa production has contributed to the settlement processes and expansion of the agricultural frontier. This expansion has had a number of negative environmental effects, in that even if it does not contribute to deforestation (given the previous history with coca leaves), cocoa cultivation does eventually stabilize previous deforestation dynamics. However, despite the classic conflict between economic development and ecological deterioration, cocoa cultivation represents an economic opportunity for the area.

Social implications: This research highlights the potential of cocoa not only as an economic driver, but also as an instrument for reshaping territorial and environmental relations. A clearer understanding of how global commodity chains interact with local socio-environmental dynamics is essential for promoting more equitable and sustainable development in the Amazon region. Cocoa is a strong income source that tends to be distributed throughout local societies, and it generates this income through the actions of a number of institutions (cooperatives and producers' associations) with the capacity to improve local governance. Furthermore, despite the significant differences in the two cases studies, cocoa generates alternatives to

more environmentally aggressive land use such as livestock farming (in Ecuador) or coca cultivation (in Peru). Therefore, from an environmental perspective, in both places cocoa is better than the existing alternatives. In Ecuador, this is due to the characteristics of the chacra system, and in Peru, it is due to its ability to mitigate some of the negative effects of coca cultivation.

Originality/value: This study compares two Latin-American countries' Amazonian cocoa production systems. It emphasises the socio-environmental features using a multiscale orientation that focused on the interaction between the global, national and local scales.

Keywords: Amazonia, cocoa commodity chains, Ecuador, Perú, food sovereignty, agroforestry systems, multiscale orientation, cooperatives

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1. Introduction

The Amazonia region plays a fundamental role in maintaining the global ecological equilibrium in such different features as biodiversity and the capacity for carbon sequestration (Dirzo & Raven, 2003). However, Amazonia is faced with a broad set of socio-environmental pressures, including the increasing extraction of raw materials (mining, oil, etc.) (Asner, Llactayo, Tupayachi & Luna, 2013; Baynard, Ellis & Davis, 2013), deforestation (Aide, Clark, Grau, López-Carr, Levy, Redo et al., 2013; Davidson, Araújo, Artaxo, Balch, Brown, Bustamante et al., 2012) and demographic growth (Barbieri, Carr & Bilsborrow, 2009). Another pressure that is becoming increasingly relevant is food production, essentially tropical crops such as coffee, oil palm and cocoa.

In addition to this, the way that global food chains operate has undergone dramatic changes in recent years (Bulkeley, 2005; Campbell, 2009; Christopher-Brown & Purcell, 2005; Friedmann, 2005; McMichael, 2009), and there is a particularly relevant element of scalarity in those transformations. Therefore, it is crucial to recognise the relevance of organisation, interaction, and coordination mechanisms at different scales (local, regional, national and global) (Krishnan, 2018; Swyngedouw, 2007). Although cocoa cropping is subject to conditions and has relevant and direct implications for local ecosystems, it is also very dependent on national and global processes (Henderson, 1997; Purcell, Martínez-Esguerra & Fernandez, 2018). Changes in the governance of food chains at different scales are also closely related to agents' economic, social and environmental upgrading initiatives (Khan, Ponte & Lund-Thomsen, 2020; Krishnan, 2018; Postuma, 2010).

The purpose of this article is to analyse how the cocoa commodity chain (CCC) works in two areas of the Amazonia in different countries (Ecuador and Peru), the factors that explain its governance and the economic, social and environmental processes of industrial upgrading (PIUs) that existing inside them. Therefore, this article can be included in the academic literature that analyses how global commodity chains (GCCs) (and specific strands within them) interact with local production systems (LPSs) and the economic, social and environmental effects associated with these interactions (Bowen & Mutersbaugh, 2014; Lee, Szapiro & Mao, 2018; Renting, Marsden & Banks 2003). This article seeks to analyse the relationship between the observed transformations at different scales in the governance of CCC and the PIUs. Hence, it focuses on the examination of agents' behaviours and strategies (MacKinnon, 2011).

This article makes four main contributions. Firstly, it examines Amazonian cocoa production systems, which are still young and scarcely studied (Brandão & Schoneveld, 2015; Krause, Ness & Leimona, 2017). Secondly, it emphasises socio-environmental features that have been little analysed theoretically and empirically but are central to the

context of the Amazonia (Baglioni & Campling, 2017). Thirdly, it aims to address a gap in the existing academic literature as there are few studies, in the context of Latin America at least, that comparatively analyse the evolution of the same crop in areas with a similar climate and farming techniques in two different countries. Finally, it provides an analysis that as a whole, has a clear multiscale orientation that is focused on the interaction between the global, national and local scales (Bulkeley, 2005; Wald & Hill, 2016).

The article is organised as follows. The following section presents the theoretical basis of the research, focusing on the governance of GCCs and the associated multiscale, and the third section briefly presents the main characteristics that define the operation of the CCC on a global scale. In the fourth section, the research methodology is described, and the fifth section analyses how the CCC operates in Ecuador and Peru, taking the national scale as a reference. The sixth section analyses the case of Tocache (Peru), highlighting its historical genesis, the main features of the agricultural management systems and the local organisation of the commodity chain. This analysis is repeated in the seventh section, where it is applied to the case of Napo province in the Ecuadorian Amazon. In the final section, some preliminary conclusions are drawn. Thus, this analysis considered not only the local scale but also the operation of the CCC on the global and national scales. The multiscale approach used in this study reviews the performance of the cocoa and chocolate commodity chains at the global (point 3), national (point 5) and local (points 6 and 7) scales.

2. Commodity Chains: Articulation, Governance, Power and Industrial Upgrading

GCCs as a theoretical framework explain the global organisation of production and consumption and replace the old statocentric frameworks. That is, GCCs explain how the production, trade and consumption of a wide range of goods are organised (at least partially) on a global scale. In this context, GCCs require the intervention of a wide spectrum of agents that have complex, competitive and collaborative interrelationships (Bair, 2008; Gereffi, 1994).

The academic literature on GCCs frequently focused on the different models of governance and the set of power dynamics associated with them (Gibbon & Ponte, 2008; Ponte, Gereffi & Raj-Reichert, 2019). It also identifies the very complex framework of territorialities that frames feature such as the physical circulation of goods, the distribution of income and benefits and the consumption patterns (Gereffi, 1999; Parrilli, Nadvi & Yeung, 2013). This is strongly related to the recognition and subsequent incorporation of a scalar element in the analysis, which is related to the power relations established inside GCCs (Grillitsch, Asheim, Lowe, Kelmenson, Fünfschilling, Lundquist et al., 2025; Jessop, 2007; Le-Billon, 2007). The first analyses of the governance of global chains often rely on implicit assumptions, such as the primacy of the global scale or the prominent role played by certain leading firms (Ponte et al., 2019). The classic contrast between producer- and buyer-driven commodity chains is a good illustration of this (Gereffi, 1994). However, the growing recognition of the increasing segmentation of commodity chains has led to the generation of a multiplicity of differentiated 'strands' that are driven by different actors and governed by different rules and conventions (Moragues-Faus & Sonnino, 2012; Sonnino & Marsden, 2006). These distinct strands are the product of both the evolution of the GCCs and of the actions of specific agents at the national, regional and local scales (Behuria, 2020; Patel-Campillo, 2011).

Thus, there is a growing number of agents that operate at different scales and possess different levels of multiscale embeddedness. The relationships among them are increasingly complex (Coe, Dicken & Hess, 2008), and evolutionary transformations are being seen in patterns of governance that have frequently changed from unipolar to bipolar or multipolar models (Fold, 2002; Ponte, 2014; Stringer, Hughes, Whittaker, Haworth & Simmons, 2016). In the multipolar models, the struggle for rent appropriation tends to be more intense, with often more agency possibilities (Grillitsch et al., 2025; Patel-Campillo, 2011). Furthermore, states are often central agents in the establishment, regulation and functioning of some GCCs to the extent that some of the GCCs can be considered to be government-driven (Ponte, 2014). This growing multiscale clearly shows that, within the same GCC, there is often a multiplicity of LFSs with specific industrial stakeholders, institutional contexts and upgrading paths (Fernandez-Stark & Gereffi, 2019), which, in turn, requires to problematisation of the relationship between GCCs and LFSs to avoiding both the deterministic explanations that fail to recognise local capacities for agency and falling into the 'local trap', thereby neglecting the complex and subordinate insertion of LFSs into GCCs (Born & Purcell, 2006; Hinrichs, 2003).

Therefore, changes in LFSs are often explained, at least partially, by transformations at higher scales (global, national) in the governance of GCCs (Bain, 2010; Barjolle, Quiñones-Ruiz, Bagal & Comoé, 2017; Glin, Oosterveer & Mol, 2015). Also, widespread changes in different LPSs can affect the evolution of different strands, which results in global effects. Therefore, the evolution of GCC governance should be seen as a complex process that is the result of both the specific actions and strategies of evolving socio-economic actors with different levels of multiscalar embeddedness and the new opportunities created by transformations in the territoriality and governance of GCCs (Bair & Werner, 2011; Gereffi, 1995). Moreover, many of these elements have strong contingent features (Hough, 2011).

A significant number of commodity chains, particularly those related to food, have originated from the exploitation and transformation of natural resources. These chains, therefore, had so-called 'extractive beginnings' in some specific geographical and ecological locations (Talbot, 2008). In such cases, little theoretical or empirical analysis has been conducted of the way that nature has been modified and appropriated (Baglioni & Campling, 2017). In addition, the sequences of joining and disconnecting from chains have been especially common in tropical food chains and have had consequences for features such as the expansion of the agricultural frontier and the forms of socio-environmental construction of nature (Hough, 2011; Moore, 2017, 2018). Indeed, many tropical commodity chains such as cocoa are heavily dependent on deforestation first and then on the abandonment of land once the soil has been depleted, after (Kalischek, Lang, Renier, Daudt, Addoah, Thompson et al., 2023; Kroeger, Bakhtary, Haupt & Streck, 2017; Ruf, Schroth & Doffangui, 2015).

PIUs are also stressed in the academic literature, possibly due to their relevance in recent years (especially in the case of many emerging economies in Asia). Initially, the PIUs were viewed from an essentially economic approach. They were said to consist of the development of a set of behaviours (organisational learning) that made it possible to advance in the commodity chain and to obtain higher incomes (Fleury & Fleury, 2001; Gereffi, 1999). PIUs required investment processes that must be framed in the context of capital accumulation dynamics (Lin & Wang, 2020; Pipkin & Fuentes, 2017). Subsequently, the concept of PIUs was broadened from generic analyses to much more detailed investigations that differentiate between economic, social and environmental upgrading, which are not always compatible (Barrientos, Gereffi & Pickles, 2016; Bernhardt & Milberg, 2011; Khan et al., 2020; Krishnan, 2018; Posthuma, 2010). However, in all these cases, PIUs imply the generation of new competencies that enable organisational development and lead to an improvement in the overall effects (economic, social and environmental) of the production processes.

Early approaches to PIUs did not question their content and implicitly considered them to be intrinsically positive processes. However, PIUs not only have costs (mainly economic and social) but are also often unsuccessful. Sometimes, only the 'early movers' reap clear benefits (Khan et al., 2020). Furthermore, progress is not the only possible outcome, as some agents and territories might also suffer setbacks (downgrading) (Bernhardt & Pollak, 2016). Therefore, the outcome of economic, social and environmental upgrading processes (which involve increased competition and investment in equipment) is that businesses often do no more than maintain their competitive position and profit levels in increasingly competitive and regulated commodity chains (Khan et al., 2020). Finally, much of the dominant logic in PIUs is based on access to differentiated quality markets that are aimed at high-income consumers who are capable of paying premium prices. Without realising it, these upgrading attempts often reproduce North-South dynamics (Campbell, 2005). However, because PIUs have a strong organisational component, they are not independent of broader institutional development processes that could take place at different scales. Thus, support from agents external to the LFSs, such as NGOs or supportive public policies, often plays an important role (Qiao, Halberg, Vaheesan & Scott, 2016). However, the importance of the actions of these actors depends on the power relations within the GCCs and their different strands as well as on a number of contingent elements. Therefore, these actions are possibly more feasible in bipolar or multipolar GCCs in which there are different actors with sufficient power and agency capabilities to promote PIUs at different scales.

3. Global Governance of the Cocoa and Chocolate Commodity Chain

The CCC is a unique agrifood chain that dates back to the 18th century. The CCC has moved around to various production geographies that have impacted on its 'extractive beginnings'. As a result, cocoa production areas have superseded each other at different times (Leiter & Harding, 2004), and there is currently a wide variety of agricultural management systems for cocoa cultivation. As cocoa is a crop that requires certain levels of shade, it is often grown alongside trees of different species. Although cocoa cultivation frequently takes place in the form of agroforestry systems, it is usually grown as a monoculture or on farms where other crops play a secondary role (Cerda, Deheuvels, Calvache, Niehaus, Saenz, Kent et al., 2014; Niether, Jacobi, Blaser, Andres & Armengot, 2020).

The long historical evolution of the CCC has resulted in a particularly segmented commodity chain with a multiplicity of positions: farmers, local traders, exporters, cocoa grinders, chocolate manufacturers and retailers (Fold, 2002; Fold & Neilson, 2016; Fountain & Huetz-Adams, 2018; Purcell et al., 2018). There is also a major post-colonial component in its effective operation. Large cocoa bean producers are in the Global South (the Ivory Coast, Ghana, Nigeria, etc.), while large cocoa importers and processors are in the Global North (the Netherlands, United States, Germany, Belgium, etc.) (see Figures 1 and 2).

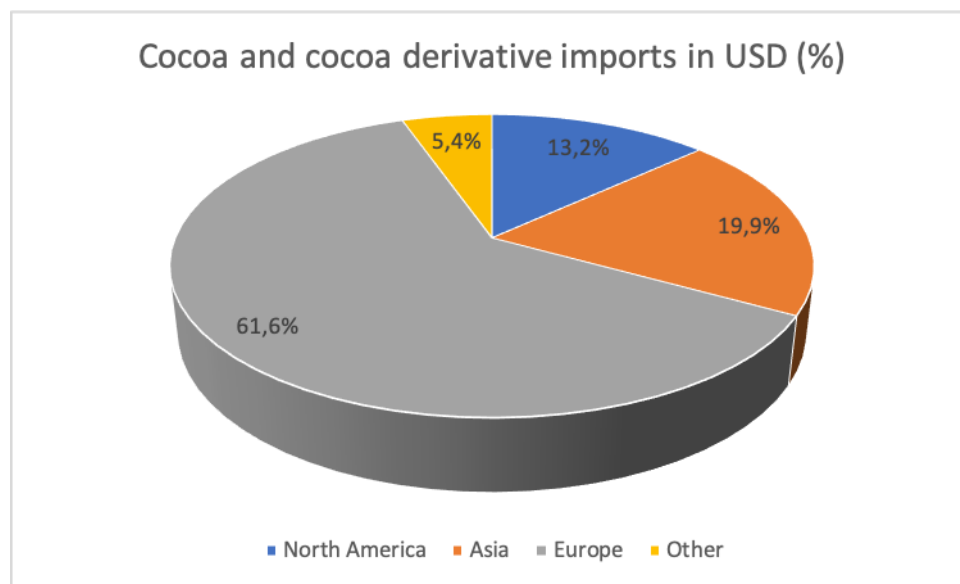


Figure 1. Distribution of cocoa and cocoa derivative imports in USD (%) in the period 2018-23 (FAOSTAT, <https://www.fao.org/faostat/es/#data/TCL>)

As can be seen in Figure 1, most imports of cocoa beans and their derivatives (liquor, paste, butter, etc.) in the period 2018-2023 were from Europe and, to a lesser extent, Asia and North America. These three regions account for almost 95% of imports in monetary terms. Europe accounted for more than 61% of imports in monetary terms. However, as can be seen in Figure 2, 62% of the cultivated area is in Africa and 17% in South America. It is therefore clear who produces and who distributes and consumes.

In the Global North, transformation, processing and sales capacities have mostly been consolidated in large operators that compete with each other. In 2018, the four largest cocoa grinders (Barry Callebaut, Cargill, Olam and Ecom Agroindustrial) negotiated more than 75% of world cocoa production (Fountain & Huetz-Adams, 2018), and chocolate manufacturing is strongly consolidated in a small number of companies, including Nestlé, Mondelez, Mars, Hershey and Ferrero. This growing rivalry between cocoa grinders and chocolate manufacturers (Fold & Neilson, 2016) reveals two poles of governance and power in a bipolar model of governance (Fold, 2002). This fact can be interpreted in different ways. On the one hand, the conflict of interests and revenues between the two steps in the commodity chain could create some opportunities for action. However, in this case, the volume of operations acts as an entry barrier for small operators. Also, the struggle between the two dominant stages to obtain

a greater share of the final revenues results in farmers being in a particularly weak negotiating position in the overall CCC, while governments actions to ensure minimum domestic prices has declined substantially in recent decades (Kolavalli & Vigneri, 2011; Tröster, Staritz, Grumiller & Maile, 2019). However, despite undermining support for farmers, the long series of interventions and regulatory systems that have been implemented at the national level in many of the biggest cocoa bean-producing countries, especially during the 1980s and 1990s, have been important in shaping farmers' prices and effective living conditions (Helt-Knudsen & Fold, 2011; Malan, 2013; Williams, 2009).

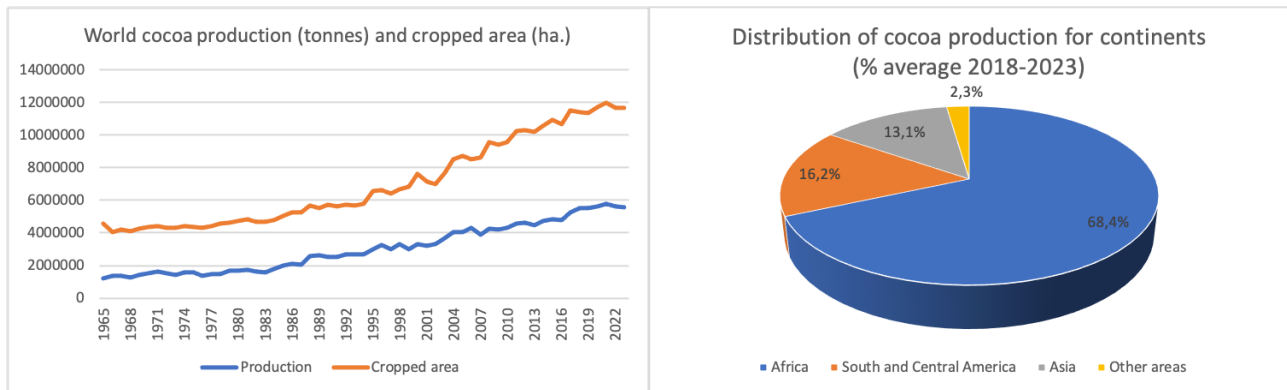


Figure 2. Production (tonnes) and cropped area (ha.)
(FAOSTAT, <https://www.fao.org/faostat/es/#data/QCL>)

Given the above situation, particularly farmers' low share of total income, it is not surprising that there are continuous attempts to subvert the operation and governance of the chain. In the recent past, these attempts have followed three main lines. The first is linked to the change in the geography of consumption and the emergence of major chocolate consumers in Asian, African and Latin American countries. The second is an increase in cocoa grinder and milling facilities in some producing countries such as the Ivory Coast, Ghana, Indonesia and Brazil (Fold & Neilson, 2016). Even so, according to FAOSTAT, over 77% of the monetary value of cocoa exports from Africa still came from bean exports in 2018, while the share of cocoa butter, paste and powder was around 22%. The third and last attempt at changing chain operation and governance is the emergence of initiatives to produce high-quality cocoa, which can command higher prices and benefit from shorter marketing circuits (Cidell & Alberts, 2006). These three trends are arenas of dispute where the possibility of modifying coordination mechanisms and, consequently, the forms of surplus distribution, may exist. Furthermore, the last two trends can be considered the result of the application of national-scale PIUs in some of the main producer countries (Campbell, 2009; Friedmann, 2005; Purcell et al., 2018). A hypothetical success in the generalisation of these initiatives in the main producing countries could have an effect on the global governance of the CCC.

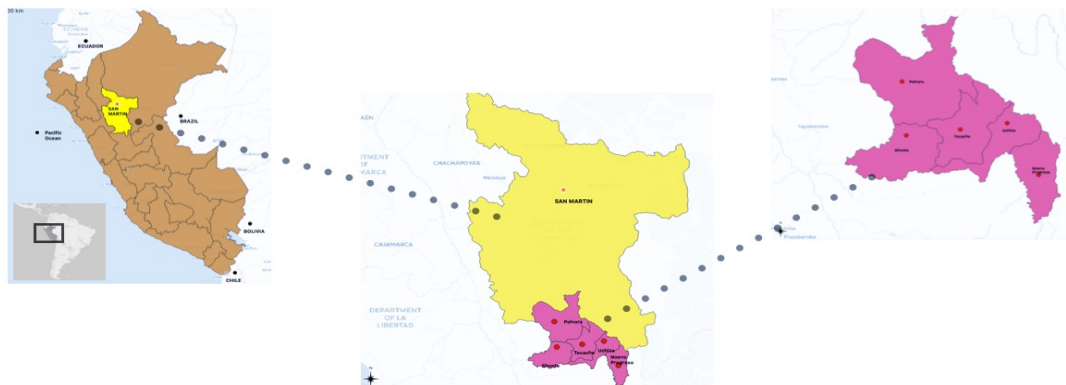
Notwithstanding, the social construction of quality is, once again, characterised by a strong post-colonial bias that is closely associated with the Global North. Thus, references to Swiss, Belgian, British, Austrian or Italian chocolates can frequently be found. Manufacturers in these countries select different variants of cocoa with different aromatic properties and perform the grinding, transformation and elaboration of chocolates and pralines (Cidell & Alberts, 2006; Fold, 2002; Garrone, Pieters & Swinnen, 2016). Although the majority of existing certifications (organic, fair trade), improve farmers' incomes, they tend to reproduce this cognitive framework, and there is no clear association of quality with any of the main cocoa bean-producing countries such as the Ivory Coast, Ghana or Indonesia. Along the same line, final customers have a broad lack of knowledge about cultivars, flavours, aromas and other organoleptic properties related to cocoa cropping and the first transformation (Afoakwa, Paterson, Fowler & Ryan, 2008; Cidell & Alberts, 2006). However, there are alternative models of certification (such as Protected Geographical Indications or Protected Denominations of Origin) for connecting certification and production locations, which empowers farmers (Meloni & Swinnen, 2018). These alternatives are widely used in other activities (wines, cheeses, olive oil) (Agostino & Trivieri, 2014; Cozzi, Donati, Mancini, Guareschi & Veneziani, 2019;

Lamani, Ilbert & Khadari, 2015), but their use in the case of cocoa is minimal, despite the fact that they could contribute to reducing the existing North-South asymmetries.

It is also important to highlight the strong and uninterrupted growth observed in cocoa production over the past 60 years. Inter alia, this growth is based on an expansion of the cultivated area, which has an evident impact on tropical forest areas (Helt-Knudsen & Fold, 2011). Africa is the main cocoa-producing area but Latin America also has a large share of global production (about 16.2% of average between 2018 and 2023, FAOSTAT). The expansion of the areas under cocoa cultivation in Latin America is affecting several ecosystems (see Figure 2). Despite their differences, Ecuador and Peru are two typical examples of cocoa bean producers in the Global South. In this regard, in the face of secular price stagnation, they have historically sought, above all, to increase physical production. They sell most of their production unprocessed, and despite being producers of quality cocoa, they receive little recognition from final consumers (Henderson, 1997; Scott, 2016).

4. Methodology

This study focused on two regions in the Amazon basin located in two different countries (Ecuador and Peru). In the case of Peru, the research focused on the Province of Tocache in the Department of San Martín (see Map 1). According to the Peruvian Statistical Yearbook of Agricultural Production, in 2019, San Martín was the Peruvian Department with the largest cocoa production (35,530 tonnes) and cropped area (65,090 ha). In the case of Ecuador, research has been conducted in the Amazonian province of Napo. Its share of Ecuadorian cocoa production is much lower, below 5% according to the Ecuadorian National Information System for Agriculture, Livestock, Aquaculture and Fisheries (Sistema de Información Nacional de Agricultura, Ganadería, Acuacultura y Pesca, SINAGAP) (see Map 2).



Map 1. Department of San Martín and province of Tocache, Perú



Map 2. Ecuadorian Amazonian region and surveyed communities

The present work is based on a pluralist approach in which different sources of information are used following different and complementary methodological orientations. Specifically, a mixed qualitative and quantitative approach is applied in which quantitative data and agents' speeches are generated, compiled and analysed (Creswell & Plano-Clark, 2011; Morgan, 2014). Three types of information sources were integrated into this general framework:

- Analysis of statistical sources, both international (FAOSTAT) and on Ecuadorian or Peruvian agriculture (for example, Statistical Yearbooks of Agricultural Production in Peru, the National Information System for Agriculture, Livestock, Aquaculture and Fisheries in Ecuador and agricultural censuses in both countries).
- *Implementation and operation of semi-structured interviews.* In the case of Tocache (Peru), 28 in-depth interviews were administered to farmers from the different cooperatives who, in some cases, also held management positions in said organisations. The interviews covered five of the six existing cooperatives in the area. In the case of Ecuador, 20 in-depth interviews were conducted with farmers and leaders of producers' associations. In both cases (Ecuador and Peru), the aim was to enable interviewees to generate their own bibliographies. For this purpose, an ontologically critical realistic approach was used in the conception and development of this research, particularly in the qualitative phase (Bhaskar, 2009). Thus, in the case of the interviews, the critical realistic approach helped to establish the initial questions, which were formulated in a very general way and left a wide margin for response. In this framework, although there was a formal script, interviews had a slight level of structuring that gave priority to dialogue generation. Following the principles of grounded theory (Qureshi & Ünlü, 2020), the interviews were coded in three stages: open and substantive (using the interviewees' own expressions and concepts), focused or selective (where special emphasis is placed on the development of codes in the topics considered to be of greater theoretical importance), and theoretical (where the previously identified codes are related to the theoretical basis of the research) (see Figure 3). The generation of farmers' own bibliographies also involved knowing their relationship with agriculture and the different crops they plant or have planted in the past. Emphasis was also placed on the characteristics of the agricultural management systems and the daily routines associated with them. If there were different crops or polyculture, the farmers were asked how they perceived the interaction between them. The main problems and uncertainties faced by the interviewees were also explored from both socio-economic and environmental perspectives. Even Though the two cases studied (Tocache and Napo) have their own particularities, farmers were asked about similar issues. For this purpose, the interview scripts of both areas had a similar structure that focused on: 1) the origin of the families, 2) Their experience as farmers, 3) the characteristics of the cocoa management system and associated crops, 4) the availability and management of labour, 5) their relationships with cooperatives and

intermediaries 6) their perceptions of quality and the certification processes and 7) the functioning of the domestic economy beyond cocoa. However, the diversity of responses meant that the interviews ultimately yielded very different results (see Appendix 1).

- *Implementation and exploitation of farmer surveys.* In the case of Tocache (Peru), surveys were conducted in four districts in Tocache province (Polvora, Tocache, Uchisa and Nuevo Progreso). A total of 469 farmers were surveyed: 194 marketed their production through intermediaries while 275 were cooperative members. In the latter case, although the selection was made on a random basis, calculations were subsequently made to ensure that there was a balance between cooperative members and farmers working with intermediaries. In the case of Ecuador, a total of 407 surveys were conducted, 323 of cooperative members and 84 of farmers who marketed their production exclusively through intermediaries. The lesser importance of intermediaries in the Ecuadorian case justifies their lower share. Given the widely dispersed nature of the habitat among Indigenous cocoa-producing populations in Ecuador, the surveys were conducted in over 30 communities located in 11 different parishes. In both cases, the questionnaires had the same six sections: 1) characteristics of farms, crops and management systems, 2) information on prices and costs, 3) functioning of cooperatives (or, where applicable, farmers' associations) and other forms of marketing, 4) use of labour, 5) characteristics of technical assistance, and 6) demographic profile of families (see Figure 4). While many questions were shared, others were context-specific. The quantitative data were processed and analysed using SPSS, which enabled the quantification of key variables and a comparative statistical analysis.

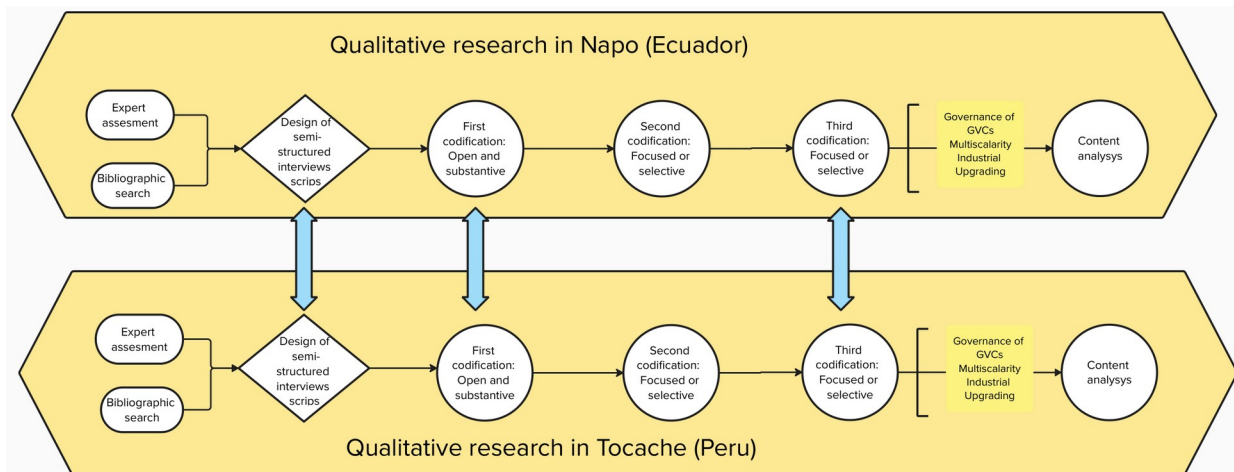


Figure 3. Design of qualitative phases of research in Napo and Tocache, Peru

One of the projects funding this research required analysis of the differences between Peruvian and Ecuadorian Amazonian cocoa. Therefore, it is important to note that the use in Ecuador and Peru of semi-structured interview scripts and questionnaires that were not identical but highly similar ensured the comparability of the two cases. The application of the same theoretical framework and the parallel analysis of the interviews by the same research team contributed to ensuring a comparable analysis of both cases. This is also explained because one of the projects funding the research was based precisely on analysing the differences between Peruvian and Ecuadorian Amazonian cocoa.

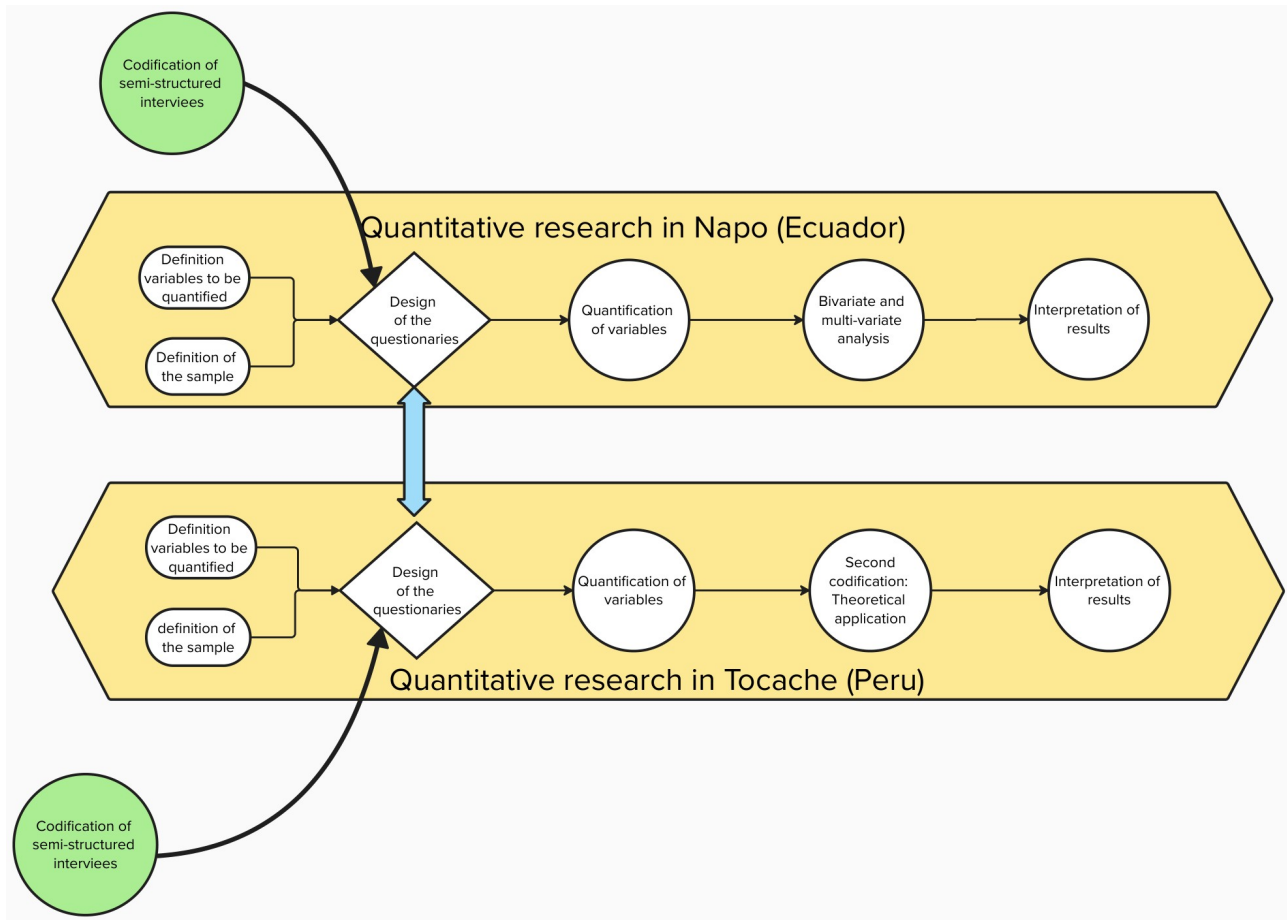


Figure 4. Design of quantitative phases of research in Napo and Tocache, Peru

5. Recent Evolution of Cocoa Production in the Ecuadorian and Peruvian Cases

This section presents the main characteristics of cocoa production, marketing and distribution in Ecuador and Peru. The analysis was undertaken at the national scale to emphasise the similarities and differences between the two countries. Currently, both Ecuador and Peru are relevant cocoa global producers. Nonetheless, both still have a relatively small share of total cocoa bean production. Average Ecuadorian cocoa production between 2014 and 2018 was just over 190,000 tonnes (3.8% of world production), while average Peruvian production was slightly over 107,000 tons (2.2% of world production) according to FAOSTAT. In both cases, these countries not only direct their cocoa production towards export, but also do this with a low level of processing. Thus, they mostly export beans or, at most, paste or liquor. Despite the great efforts made in recent years, in neither case has there been any significant production of internationally recognised quality chocolate. Some high-quality chocolates have been developed in Ecuador and Peru, but their share of the overall premium chocolate strands remains very small (Coq-Huelva, Torres-Navarrete & Bueno-Suárez, 2018; Lupton, Sánchez & Kerpel, 2018). In addition, these two countries are close to each other geographically and have similar climates and territorial divisions, with three major identifiable areas: the coast, the highlands, and the Amazonia.

There are also three major features that differentiate the cocoa production in the two countries. The first difference is in the origin and historical evolution of cocoa farming. Ecuador has been a traditional cocoa producer since the 19th century with cocoa farming at the core of its economic specialisation (Henderson, 1997). As can be seen in Figure 5, Ecuadorian cocoa production was approaching 100,000 metric tons in 1985. In contrast, Peruvian cocoa production was almost non-existent until the beginning of the 1990s, and it has risen sharply since then, particularly in the context of alternative crop projects (Figure 5) to move away from coca leaf cropping as promoted under the general umbrella of the United Nations (Coq-Huelva, Higuchi, Arias-Gutiérrez & Alfalla-Luque, 2023). There has been a sharp increase in production since 2005.

The second major difference is the different cocoa production sites. In Ecuador, cocoa farming is concentrated in the coastal region, which accounts for approximately 80 % of total production. In contrast, the Ecuadorian Amazon region only accounts for about 7 %. In Peru, the reverse is true. In 2017, Peruvian Amazonia accounted for almost 60 % of the country's total cocoa production (Peruvian Statistical Yearbook of Agricultural Production). Therefore, the expansion of cocoa in Peru is inextricably linked to settlement processes in the Amazonia. The Department of San Martín (in which the province of Tocache is located) is the main producing area in Peru. Its share of national production was over 42 % in 2017, according to Peruvian Statistical Yearbook of Agricultural Production.

The third difference is in the quality of agrarian cocoa production. There are different shares of aromatic cultivar production in the two countries. Ecuador has a clear competitive advantage due to its high share of aromatic cocoa production, which is crucial for the production of high-quality chocolates. About 70% of Ecuadorian exports are aromatic cultivars. In Peru, there is only a minor production of aromatic cocoas. The dominant variety in the area is CCN-51, which is considered high quality but lacking in any special aromatic properties. In recent years, attempts have been made to increase the share of aromatic cocoa production but it is still small. As CCN-51 offers greater performance and resistance to fungal diseases, at this point, a 'strategic downgrading' model has been chosen.

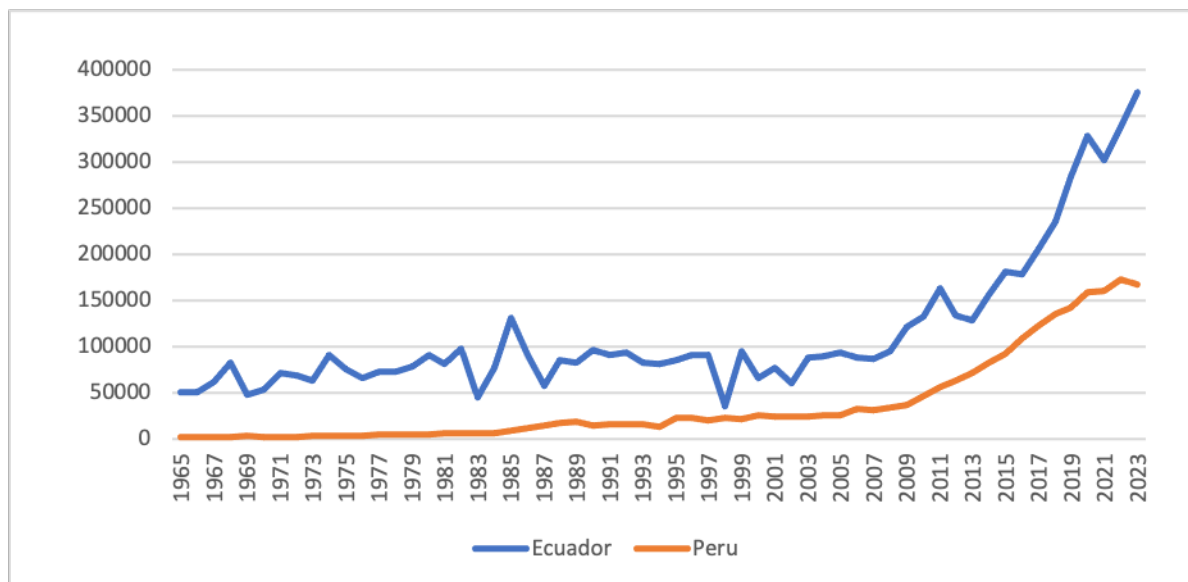


Figure 5. Ecuadorian and Peruvian cacao production (tonnes)
(FAOSTAT, <https://www.fao.org/faostat/es/#data/QCL>)

6. Cocoa Production in the Peruvian Amazonia: The Case of Tocache

This section analyses the main characteristics of cocoa production, processing and distribution in the Tocache area of Peru. The analysis, therefore, focuses on the local scale in an Amazonian context.

6.1. Colonisation Process, Expansion of Coca and Development of Cocoa-Growing

The development of cocoa needs to be seen in relation to the characteristics of the colonisation processes that have shaped the area's productive specialisation. The colonisation of Tocache began in the 1960s when settlers arrived from other areas of Peru, particularly from the highlands (Morel, 2014). While the settlement process was partly the result of political design, the settlements were characterised by a lack of institutionality and, therefore, of structures that could shape the regional and local scales that are essential in any colonisation process. In this context, the Amazonia was socio-politically constructed on a set of interrelated myths, among which can be highlighted its conception as a homogeneous wasteland with 'immense' unexploited resources that were able to easily generate economic income and wealth (Figallo & Vergara, 2014). This was clearly not the case, as the Amazonia was much more difficult to exploit than the pro-settlement propaganda promised (Dourojeanni, 1976).

The myth of abundance was inherent in the lack of strong local institutions, which was one of the factors that explains the exponential growth of coca cropping from the mid-1970s. Coca growers were isolated Amazonian farmers who were connected to other agents (particularly criminal networks), which generated an illicit GCC. In fact, there were high levels of specialisation and competition, that were often linked to violence. As a result, its operations transcended Peru's borders. Coca production and prices depended on international demand, and access was essentially controlled by Colombian and Mexican cartels (Montero, 1995). There were various contingent factors, such as the high prices of coca leaves and the role of the guerrilla Shining Path, that contributed to the dramatic expansion of cultivation in the 1980s. Also, its gradual disappearance from the beginning of the 1990s, was a process in which several factors converged (defeat of the Shining Path, fall in coca prices, etc.). However, one of the key elements was the installation in the Tocache area of both international (DEA, UN programmes, various NGOs) and Peruvian-State institutions (Prodatu-Provida). In other words, institutional development occurred at regional and local scales. The transfer of knowledge (technological packages that facilitated the cultivation of alternative crops such as cocoa) was able to change the perceptions about the long-term interests and strategies of the local actors (Bair & Werner, 2011; Hough, 2011). In other words, there was a significant improvement in governance at the local and regional scales that was associated with the emergence of alternative crops such as cocoa, coffee and palm oil.

6.2. Agricultural Reality of Cocoa Production in Tocache

Cocoa in Tocache appeared as a substitution for coca leaf cultivation. Production was incorporated into the CCC from the beginning, and monetary incentives played a fundamental role. Therefore, modern systems of agrarian management based on monoculture prevail, with some auxiliary vegetation to provide shade. The aim of these systems is to maximise profitability and land use. As the coca leaf cropping had previously resulted in high levels of deforestation, the emergence of cacao cultivation generated a kind of equatorial agricultural landscape.

The good acclimatisation of cocoa to the area must be highlighted. Cocoa profitability has been supported by relatively high yields. Specifically, according to the Peruvian Statistical Yearbook of Agricultural Production, the average for the Department of San Martín (which includes the province of Tocache) between 2014 and 2017 was 942 kg per hectare. In some interviews, however, slightly higher numbers were mentioned. Francisco, a male cocoa farmer aged between 55 and 65 and a member of the management board of one of the local cocoa cooperatives, stated that:

“We are at over 1200 kilograms a hectare... We want to get to 2000 because we are starting work on the issue of the impact of irrigation and this year, we are going to start work on the 27-hectare project and show that if we can get 1200 now, we can reach 2000 with the use of technology.”

To achieve this expansion, both pest control and correct soil management have been essential. Several different courses of action have been taken to control pests, and soil management has paid particular attention to problems of nutrient depletion (Hecht, 1985; Peña-Venegas & Cardona, 2010). Cocoa production in Tocache is based on the widespread use of fertilisers that provide different macro and micro nutrients. Other important advances have been made in irrigation as water resources are relatively abundant and located nearby. The natural rainfall regime is sufficient for the crop to develop but it does not prevent the plants from sometimes being subjected to water stress.

All of these factors that explain the relatively high yields have required the development of forms of collective learning that have required input from cooperatives, which have organised courses, promoted best practices, etc. Thus, the cooperatives, together with some NGOs, have become essential institutions in coordinating farmers at the local scale and connecting them with other stages of the value chain. They have therefore filled the gap that existed at the local and regional scales.

6.3. Cooperatives, Industrial Upgrading and Operation of Differentiated Quality Segments

Cocoa cooperatives are the main farmer-controlled organisations in Tocache, and they have faced increasing market segmentation and price pressures. In this context, a differentiation process based on different labels can be observed. Specifically, three large cocoa segments with differentiated prices and contrasting and consolidated markets can be identified: conventional, organic and UTZ. There is also a small fair-trade niche. Cooperatives have

played and continue to play a very important role in obtaining and managing these certifications, which must be recognised as economic, social and environmental PIUs. Additionally, cooperatives have received significant support from other institutions. For example, the Public Administrations and some NGOs such as the German Agency for International Cooperation (GIZ) have played a central role in obtaining some of these labels.

Given the characteristics of the territory (extensive, wooded, with jungle in some areas and difficult access), guaranteeing the proper monitoring of the protocols for the certification companies is especially difficult. Therefore, the cooperatives have an important role in closely and effectively monitoring compliance with the protocols and excluding “de facto” farmers who do not respect them. Almost all of the batches of cocoa sent for export are then subjected to very stringent analyses of composition, substances and traces at their destination. If traces of prohibited substances are found, not only is the shipment returned, but future transactions are also compromised. In other words, there is control from grinders and chocolate manufacturers to cooperatives and from cooperatives to farmers. In this sense, the certification processes cannot work without the input of the cooperatives at the local scale. The role of cooperatives in ‘disciplining’ farmers’ behaviour is a clear example of the exercise of micropower (Jessop, 2007).

These control measures are necessary given the economic costs associated with the certification process. The systematic use of fertilisers and the wide variety of pests means that converting to organic farming is not only extremely costly but also means greater farmer involvement. For this reason, certifications are not adopted in all cases, and some ‘strategic downgrading’ behaviour has even been observed. Thus, a large proportion of producers still supply conventional, non-certified cocoa, and the dominant cocoa variety continues to be CCN-51, despite demand for premium aromatic cultivars. Another element of the PIUs of the cooperatives that is related to the increasing demand for quality is the centralisation and standardisation of drying and fermentation activities, which is why almost all cooperatives now have their own drying and fermenting facilities.

Therefore, a number of endogenous and exogenous actions, particularly at the local scale but recognised by other steps of the CCC, are involved in the development of these PIUs. As a form of PIU, certification has allowed some objectives to be reached, such as guaranteed access to certain markets or a moderate rise in prices received by farmers. However, because of the kind of certification promoted and because all of the production is still sold in bulk, the PIUs have not tried to subvert the operation of the CCC, but rather to insert farmers inside them in the best possible position. In this sense, cocoa from the area is not marketed as ‘food from somewhere’ but tends to be used as a raw material in the production of ‘food from somewhere’ in other parts of the world (Campbell, 2009; Schermer, 2015).

7. Cocoa Production in the Ecuadorian Amazonia: Indigenous Farms

This section analyses the main characteristics of cocoa production, processing and distribution in the province of Napo, Ecuador. As in the previous section, the analysis focuses on the local scale in an Amazonian context.

7.1. Colonisation and Indigenous and Colonist Populations

The settlement process in the Ecuadorian Amazonia unfolded in parallel with that of Peru. Since the mid-twentieth century, the area has been settled by colonists who mainly arrived from the highlands. These migrations were heightened by the Land Reform, Idle Lands, and Settlement Act of 1964, which lay down a land distribution process (Bréton, 2008). In this context, a large quantity of land in the Amazonia was distributed among the new settlers, with a reference area of 50 hectares (Gondard & Mazurek, 2001; Maldonado-Lince, 1979). The Amazonia was also conceived as a homogeneous wilderness with immense resources. Ecuador also exhibited the same lack of institutionality at the regional and local scales associated with the settlement process as noted in Peru. The main difference was that colonist populations historically found it difficult to develop successful cropping systems, and rapid soil depletion led to a similar transition from agriculture to livestock to that observed in certain areas of the Brazilian Amazon (Hecht, 1985). Thus, new settlers have been identified with livestock in the same way that Indigenous populations are identified with agriculture (Vasco, Bilsborrow, Torres & Griess, 2018).

Moreover, there has continued to be a large Indigenous presence in almost all of the Ecuadorian Amazon. The province of Napo in particular has a significant Indigenous population. Indigenous populations in general and

Kichwas (the biggest ethnic group) populations in particular carry out their agricultural activities following a traditional polyculture system known as *chacras* (Perreault, 2005). The main characteristics of this system are described below.

7.2. Agricultural Reality of Cocoa Production in the Ecuadorian Amazonia: Integration into Indigenous Farms

The introduction of cocoa into the Ecuadorian Amazonia was very different from the Peruvian case discussed above. Cocoa was integrated into Indigenous polyculture systems (*chacras*) as the main commercial crop. Therefore, there was initially no need for relevant support and assistance institutions, as there was no truly significant transformation of farming systems. This also explains the low yields and small average size of farms. The average size of cocoa farms in the provinces of Napo is 8.7 hectares, of which 2.7 hectares are directly given over to growing. These systems are characterised by their low land consumption, which is especially important due to the strong population growth observed in the Ecuadorian Amazon (Barbieri et al., 2009).

A *chakra* is a polyculture-based farming system that typically includes cocoa, bananas and cassava. Bananas are cultivated on 80.5% of farms, while cassava, a key staple crop, is grown on 87.3% of farms. Both crops are primarily intended for family consumption. Other crops such as maize, peanuts and beans are also cultivated, although they play a comparatively smaller role in the cultivated area and subsistence use. In principle, this form of production is quite independent of the general evolution of agricultural production in Ecuador. However, it has become increasingly important given the commitment to the concept of food sovereignty of different social groups, particularly Indigenous communities (Viejó-Bautista, Higuchi & Coq-Huelva, 2025). In other words, *chacras*' production is one of the elements that have brought about the emergence of community and local scales in the Ecuadorian Amazonia (Coq-Huelva et al., 2018).

To the extent that cocoa contributes to ensuring the survival of the *chakra* as an agricultural model, a number of socio-environmental effects are produced. On the one hand, the Indigenous component is strengthened in the context of the struggle for land. On the other hand, by limiting the expansion of livestock farming, a less extensive and more sustainable pattern of land use is promoted with a higher level of biodiversity maintenance. As several parameters show, the Amazonian *chacras* are also characterised by high levels of biodiversity, with over one hundred plant species coexisting on farms (Tanguila, 2020). Nevertheless, it is important to highlight that the variety of vegetation is the result of two processes: the natural tendency towards the conservation of species that grow in the Amazon Forest and the patterns of human intervention that have tried to preserve and increase biodiversity on farms as much as possible. The fruit tree with the greatest presence in the farms surveyed was the lemon, with 88.9%, followed by the abiu fruit with 84.4%, and the cherimoya, with 82.2%. The role of agroforestry systems is also particularly important as they generate corridors that help to preserve the complexity and biodiversity of primary forests (Dutrieux, Jakovac, Latifah & Kooistra, 2016). The growing importance of the environmental aspects in both global governance and at the different scales of the CCC has also contributed to the progressive valorisation of these elements.

The synthetic representation of the *chacras*' productive capacity creates a series of major challenges, as most of their production is for self-consumption. However, even valuing the production for self-consumption at market prices, the income generated is very low, around US\$1035 per hectare per year. These low incomes appear to be directly related to the low yields obtained from the cocoa plantations and can be explained by a combination of factors. The main factor is the difficulty for agricultural management systems to control the spread of fungal diseases (specifically *Monilia*). Other factors are the almost complete lack of fertiliser use (in soils with acute deficits in basic nutrients) and the lack of drainage systems to deal with the over-abundant rainfall that occurs during certain periods. In other words, there are still elements of the limited development of specific institutions tied to this farming system. The various upgrading initiatives applied to agricultural production have failed to address the issues. In particular, there has been a general lack of understanding of polyculture-based agroforestry farms and a failure to adapt to their management.

7.3. Cooperatives, Industrial Upgrading and Operation of Differentiated Quality Segments

There are two features of the cocoa produced in the Ecuadorian Amazon that should be noted. First, it is produced using agricultural systems with little intervention, such as the *chacra*, which gives it an intrinsic level of quality that makes it relatively easy to market in “premium” segments. Second, the existence of a differentiated quality segment requires not only a suitable product but also a group of agents who take responsibility for acting on these strands. Thus, the existence of a differentiated quality strand in the Ecuadorian Amazon, which has been essentially developed by farmers’ associations and cooperatives, can be considered an outstanding case of economic, social and environmental upgrading, although there are shortcomings in production because of low yields and the high incidence of fungal diseases. The actions of the cooperatives require support from some NGOs (particularly the German cooperation agency, GIZ) and specific promotion by the Ecuadorian government. Nevertheless, in this case, the process was more indirect than in Tocache, as it was the result of the internal dynamics in the territory rather than being generated through massive intervention. However, in any case, not all Amazonian cocoa is currently properly valued in the quality segment. Only between 30% and 40% has been sold in differentiated quality strands in the province of Napo.

These initiatives have allowed differentiated export channels not only for cocoa beans but also for semi-processed products (cocoa liquor or paste) and even for chocolate aimed at final consumption in premium markets. Therefore, in contrast to the case of Tocache in Peru, the PIUs have sought a better position in emerging strands and developed new channels with direct access to final markets (Coq-Huelva et al., 2018). Thus, as well as questioning the prevailing forms of social construction of the quality of chocolates, the PIUs have had a more subversive character. However, the existing possibilities have not been fully exploited because quality is built by emphasising the product’s organic nature, even though the organic standards are much less environmentally strict than the zero-input model that is currently adhered to in the area. Furthermore, there is a fundamental contradiction between the commitment to subsistence agriculture based on direct access to sufficient and relatively affordable food sources and the promotion of ‘premium’ products targeted at high-income segments in a GCC.

Cooperatives and producer associations have also been the object of an intense policy of state intervention in the Ecuadorian case (Díaz-Montenegro, Varela & Gil, 2018). In fact, producers’ associations (usually with a direct connection to specific Indigenous communities) have become genuine intermediate scales with territorial capacity for action, which, in turn, has resulted in the development of strong disciplinary powers. As in the Tocache case, these associations conduct ‘in situ’ inspections of the quality of the cocoa offered by their members and also decide whether the cocoa meets the required quality. Thus, compliance with the quality standards required for supplying premium segments are ensured. In other words, producer associations have promoted a certain, albeit limited and insufficient, transformation of the systems of agrarian management, which can be considered a form of PIU.

The cooperatives and producer associations have also favoured the development of drying and fermenting facilities, which has played a central role in obtaining quality cocoa and cocoa derivatives. Indeed, at present, the main cooperative in the area buys all its cocoa as wet cocoa (referred to locally as ‘cocoa in slime’) and then dries and ferments it in purpose-built facilities. In addition, it has developed collaboration agreements that enable it to produce its own chocolate by renting factory facilities.

8. Conclusions

The two Amazonian regions analysed (Tocache in Peru and Napo in Ecuador) actively participate in the cocoa commodity chain, by trying to avoid mainstream strands and focusing on specific quality segments. The emphasis on quality arises in a context where the prices received by farmers are perceived as low. Therefore, it is argued that the production of an undifferentiated commodity structurally weakens the farmers’ position in the price-setting processes. Similarly, the farmers blame the low prices on the intermediaries. All of this takes place in a general context marked by intense, albeit discontinuous, processes of colonisation characterised by the frequent absence of relevant institutions at the regional and local scales.

In response to this reality, farmers have focused their actions on creating cooperatives and producers’ associations as key institutions with the capacity to act both in the CCC and in specific territories and communities. In both the

Ecuadorian and Peruvian cases, the cooperatives have led to relatively successful processes of industrial upgrading that, in one way or another, have affected cocoa production in both areas. Thus, cooperatives and farmers' association have shown their ability to obtain higher prices and achieve a certain but limited improvement in farmers' living conditions.

Certifications generally pursue different objectives that are often somewhat contradictory. However, neither in the Peruvian nor the Ecuadorian case has there been any notable conflict between the environmental, social and economic elements. In other words, the cost increases associated with organic certification, for example, are either non-existent (Ecuadorian case) or affordable (Peruvian case). The cooperative-led upgrading initiatives have been supported by different NGOs in an example of action at different scales, which is particularly noteworthy given the limited tradition of developing institutions at regional and local scales. In many cases, this has generated public-private collaboration schemes that are essential for understanding the dismantling of coca farming in Tocache, for example, and its replacement by crops such as cocoa. The actions of the Ecuadorian state and several NGOs have also been fundamental in the development of the quality segment in Napo. In other words, cocoa production and distribution in the Peruvian and Ecuadorian Amazon is increasingly responding to a multipolar and multiscale logic. To put it another way, the growing participation of the Amazonia in the global CCC can be understood to be the result of multiple actions implemented by different agents with significant levels of multiscale embeddedness.

There are noticeable differences between the two areas in the characteristics of the cocoa agrisystems and the type of landscape that they generate, which, in turn, is the result of the different historical forms that settlement processes have taken and the great differences between the agents that drive cocoa production. In the case of Ecuador, the process is led by farmers and organisations with a strong Indigenous element. As a result, cocoa farming is associated with traditional polyculture systems characterised by high levels of biodiversity, a close association with an element of food sovereignty and low levels of capital accumulation. Moreover, the integration of cocoa into the Indigenous polyculture systems contributes to establishing a new way of producing food that is much less space-consuming. The process of industrial upgrading has essentially consisted of the commercial valorisation of cacao as the chacra's leading product.

In Peru, by contrast, cocoa is one of the key crops (along with coffee and oil palm) in an advancing settlement process based on high levels of land use. There is also a greater market orientation, a higher capacity to generate income and, therefore, a more intense capital accumulation dynamic. This has contributed to a significant expansion of the agricultural frontier based on much lower levels of biodiversity (Moore, 2018). Thus, due to the area's previous connections with coca production, this is not clearly perceived by local agents and it acts as a powerful agent of deforestation in the long term. This behaviour is essentially analogous to that observed in other areas with tropical climates such as some African producers (Ofori-Bah & Asafu-Adjaye, 2011; Ordway, Asner & Lambin, 2017). In this case, the industrial upgrading process has essentially consisted of promoting certain certifications and using them to place the relatively high cocoa production of the area into a range of differentiated segments.

In conclusion, the development of cocoa production and processing in the Ecuadorian and Peruvian Amazon has some common features: orientation towards quality markets, the importance of the economic and environmental upgrading processes, and the relevance of the actions of cooperatives, NGOs and national states, etc. In general, these processes of industrial upgrading have contributed to the creation of a CCC with an increasingly clear division between 'food of somewhere' and 'food of nowhere'. The paradox is that virtually all of the cocoa from Tocache and most of the cocoa from Napo contributes to the production of 'food of somewhere else' and help to provide flavour and aromas to chocolates that are ground and manufactured elsewhere (Campbell, 2009; Schermer, 2015).

However, there are also several significant distinctive features that can be explained by the differences in the agents involved. These differences have very different environmental effects that result in the generation of different landscapes. Tocache is experiencing a rapid transition from jungle to what can be defined as an equatorial agricultural landscape. A similar phenomenon can be observed in Napo due to the spread of livestock activities rather than cocoa (Lerner, Rudel, Schneider, McGroddy, Burbano & Mena, 2015; Ríos, Benítez & Soria, 2016). However, the integration of cocoa into the Indigenous polyculture systems contributes to protecting the primary

forest and biodiversity by connecting isolated patches and containing the expansion of the agrarian frontier. Considering both examples together, the existence of variegated and increasingly differentiated cocoa landscapes can be observed. All this is occurring in the real world in an Amazonia that is far removed from the widespread pristine conception that is held of humid forest regions.

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The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Appendix 1

Interview Script For Agents And Experts

1. **Origin of the Farms and Farm Products** (In the case of experts, the questions would be asked in general terms.)
 - Extension of the farm (for size and total area).
 - Form of land access (ancestral rights, occupation, purchase, inheritance, etc.).
 - Distribution of the surface of the farm between:

Land-use distribution:

 - Native forest
 - Second forest
 - Livestock pastures
 - Cultivated area
 - Wetlands
 - Aquaculture
 - Since when do you have effective possession of the properties?
 - Have you cleared native forest in recent years? When? What have you used the land for?
 - Existing crops on the farm. Historical patterns of transformation.
 - Since when have they been used for cocoa cultivation?
 - Relationships between the different types of existing crops. How is interaction understood?

- Whether or not there is livestock associated with the farm.
- Whether or not there are farms associated with the farm.

Types of production:

- Ornamental
 - Artisanal
 - Subsistence
 - Mixed production
 - Minimal management
- Can it be considered an agroforestry operation?
 - Degree of intervention in the original ecosystem (native forest with low intervention, native forest with significant thinning, secondary forest with low intervention, secondary forest with high intervention). Historical profiles of the transformations experienced based on the accounts of the stakeholders.
 - Worldviews associated with forest use (especially in the case of indigenous communities)
 - Existing facilities on the farms (approximation of capitalization levels)

2. Characteristics of Family Economies

- Living system
- Age
- Where were you born? Were you born here or did you come from another region or area?
- Do you consider yourself a settler or indigenous?
- Do you belong to a native community?
- Do you speak a native language? Which?
- When did you come to live here? Why did you come?
- Have you been living abroad? How long?
- Were you able to go to school?
- What school did you attend?
- Are you married? When did you get married?
- What was your wedding day like?
- How many people live in your house and eat from the same pot?
- Do you have children? How many? Are they attending school or did they receive education?
- Where are your parents from? Were they farmers?
- Nuclear or extended family group
- Number of family members
- Age of the dominant male figure (patriarch)
- Was the “head” born in the community? If not, when did he move?
- Sexual division of labor. Tasks performed by men and women.
- Levels of child labor. Wage labor and on the farm itself
- Origin of monetary income obtained by the family unit (Internal to the farm / External to the farm)
- Origin of internal monetary income to farms obtained by family units

On-farm income sources:

- Wood
 - Cacao
 - Other crops (specify)
 - Sale of farm products
 - Livestock
 - Aquaculture
- Materials used to make the house. Level of satisfaction with its condition.
 - Household assets. Main purchasing “wants.”
 - Families’ monetary needs.

- Family needs met based on production from their own farms.
- Relevance of barter among peasant families.
- Distribution of work time (commercial wage labor versus self-employment) among different family members.
- Actual savings levels.
- Main potential projects to improve your facilities.

3. History as A Farmer

- How long have you been a farmer?
- Are you a landowner? YES/NO
- How many hectares do you own? Are they registered/legalized? Can you sell them if you want to?
- Is there any problem registering the land?
- How did you acquire the land? Did you occupy it? Did you inherit it? Did you purchase it?
- Do you live on your land or in the village?
- Have you made any improvements to the land in recent years?
- Do you have irrigation facilities? Dryers or other infrastructure?
- Do you own machinery, a trimmer, or a chainsaw?
- What crops have you grown on your plot throughout your life?

(For Peruvian farmers):

- Have you worked with coca?
- What benefits did you see in coca?
- What problems were starting with coca crops?
- Did you attend the expansion of coca in the area?
- If you were very young, what is your perception of coca's expansion?
- What benefits or problems were created by being a coca grower?
- What was the conversion process to cacao like?
- Who leaded it? Who proposed it?
- What benefits or problems are created with cacao?
- Was the reconversion process difficult?
- Why did they plant cocoa and not other crops like coffee or others?
- Has coca been completely eradicated?

4. Cocoa Production Management Systems

- Production and management systems
- How much cocoa did you produce? Specify a reference period (year/month/week).
- Production stability and number of years and harvests.
- Use of phytosanitary products (fertilizers, pesticides, fungicides): product names, number of applications, dosage, suppliers, and prices.
- Soil analysis / leaf analysis.
- When was the cacao planted?
- How many hectares?
- How many trees per hectare? Distance between trees. Regular or irregular
- Existing cacao varieties (CCN-51, Hybrid, Criollo, Fino de Aroma, etc.) Benefits and problems associated with the existence of different varieties.
- Other crops on the farms. Production levels. Market and self-consumption orientation
- Potentially subsistence-oriented crops: rice, corn, coffee, banana, cassava, peanuts, beans
- Potentially market-oriented crops: oil palm, coca. Please emphasis on coca.
- Livestock activities: chickens, cattle, pork, aquaculture.

Annual management cycle:

- Overview of the management system and sequence of tasks throughout the year.
- Description of soil preparation tasks.
- Description of the planting process. Emphasize:

The planning process:

- Origin of seeds (controlled or not by the farmers themselves).
- Spending on seeds.
- Use of family or off-farm labor.

- Description of the fertilization process. Insist on:

The fertilization process:

- Number of fertilizer applications.
- Type of fertilizer used (organic/non-organic).
- Fertilizer prices and approximate share of total costs.
- Origin of fertilizer and degree of control by farmers or their associations.
- Machinery and tools used.
- Use of family labor or labor from outside the farm.

- Description of weed control. Emphasize:

The weed control:

- Consideration of vegetation cover.
- Recommended vegetation cover plantings.
- Number of herbicide applications.
- Type of herbicide used (organic/non-organic).
- Herbicide prices and approximate share of total costs.
- Origin of herbicide and degree of control by farmers or their associations.
- Machinery and equipment used.
- Use of family or off-farm labor.

- Description of irrigation systems. Emphasize:

- Existence or absence of irrigation:

- Irrigation:
 - Source of water.
 - Water restrictions.
 - Infrastructure associated with irrigation.
 - Use of family labor or labor outside the farm.

- Description of pruning operations:

- Pruning operations:
 - Number of pruning operations.
 - Machinery restrictions.
 - Use of family labor or labor outside the farm.

- Harvest description:

- Harvest:
 - Number of harvests.
 - Harvest times.
 - Average yields.
 - Harvest variability.
 - Average prices.
 - Price variability.
 - Machinery and equipment.
 - Use of family or off-farm labor.

5. Labor

- Do they hire outsiders or do only the family work?
- How many outsiders?
- How often do they hire?
- How long?
- Wage (currency/day)
- Family labor? Who works? How many hours? Who works?
- Role of women and men on the plot: What does each person do?
- Working hours of each family member

6. Relationships with Other Actors in the Value Chain

- Cooperatives and intermediaries
- Are you a member of the cooperative? Which one? Since when?
- Have you ever changed cooperatives?
- Does the cooperative hold meetings? Do you attend meetings? Why?
- Do you belong or have you ever belonged to the board of directors?
- Do you sell all your cocoa production to the cooperative or to intermediaries? Why?
- How do the cooperative and the intermediary pay you?
- To be confirmed: Do you sell in bulk to the cooperative and in bulk to the intermediary?
- What benefits does the cooperative bring to you?
- Benefits of the cooperative (providing phytosanitary products at a better price, technical advice, etc.)
- Do you receive technical assistance from another institution?
- Are there any drawbacks to being a cooperative member? Advantages and drawbacks of the intermediary
- Whether or not a member of a grain marketing cooperative. Relationship with it. Assessment.
- Relationships with intermediaries. Collectors. Assessment.
- Who handles transportation? How far? Costs associated with transportation.
- Relationships with agribusinesses.

Cocoa Quality

- Do they require any quality requirements? Does the cooperative or intermediary buy all your cocoa, or do they reject it due to quality issues?
- Transportation: Do the cooperative and intermediaries go to the plot, or do you have to deliver the produce to them?
- Is there a difference in the price paid for the type of cocoa variety?
- Does the cooperative/intermediary buy all cocoa varieties?
- How much does the cooperative/intermediary pay you per kg (dry, slime, etc.)?

Non-Cocoa Crops

- Do you sell to intermediaries? Directly in markets?
- At what prices? How often?

Economic Data

- Can your household support from cocoa or do you need to supplement with other income?
 - Average household income (US\$/month)
 - Share of income from agriculture and cocoa (%)
 - Is there a salaried worker in the family?

Perspective

- Has the new generation's view of agriculture/farm management changed?
- Do you think something can be done to improve farming? The government? The cooperative?

Questions for experts only

- Short chains vs. long chains: relative importance.
- Role and relevance of cooperatives.
- Main agro-industries. Assessment of their role. Existence of locally rooted agro-industries.
- “Premium” prices in territorially rooted agro-industries?
- Main exporters. Assessment of their role. Existence of locally rooted exporters. Relevance of grain exports and processed or semi-processed products.
- Chocolate in the Amazonian identity.

Quality initiatives in Amazonian cocoa.

- **Organic production.** Underlying civic conventions:
 - Reaching farmers.
 - Reaching intermediaries.
 - Reaching industrial companies.
- **Fair Trade.** Underlying civic conventions:
 - Reaching farmers.
 - Reaching intermediaries.
 - Reaching industrial companies.
- **Technical improvement processes for cocoa production.** Underlying industrial conventions:
 - Impact on farmers.
 - Impact on intermediaries.
 - Impact on industrial companies.
- **Designation of origin:**
 - Impact on farmers.
 - Impact on intermediaries.
 - Impact on industrial companies.
- Dialogues between the indigenous “worldview” and “Western” convention systems.

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