European Commission

VALUE CHAIN ANALYSIS FOR DEVELOPMENT

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Analysis of the cocoa value chain in Ecuador

Value chain analyses assist in informing policy dialogue and investment operations. They help the understanding of how agricultural, aquaculture and fisheries development fits within market dynamics. They permit an assessment of the value chains' impact on smallholders, businesses, society, and environment.

The European Commission has developed a standardised methodological framework for analysis (https://capacity4dev.europa.eu/projects/value-chain-analysis-for-development-vca4d_en) It aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

Value chain context

Ecuador has ecological and environmental conditions that are conducive to cocoa. In addition, its great microclimatic diversity allows for the production of different aromatic profiles, which are appreciated by manufacturers of high-quality chocolate, and a supply that is available almost all year round.

Cocoa production has grown in recent years in replacement of less profitable crops (e.g. coffee) or crops affected by pests and diseases (e.g. oil palm).

More than 90% of cocoa is exported as beans to the United States, Europe and Asia. Ten per cent is processed in the country, mainly into semi-finished products and chocolates for regional and international export as well as the domestic market.

European Union intervention

Within the framework of the 2014–2021 Multiannual Indicative Programme and for a total of €67 million, the Government of Ecuador and the European Union (EU) have focused their cooperation on: (i) supporting sustainable and inclusive growth at the local level, and (ii) promoting sustainable trade. The cocoa value chain (VC) benefits from this support.

The EU, with €26 million in budget support, also supports the Agenda for Economic and Productive Recovery in the areas affected by the 2016 earthquake, in line with the 2017-2021 National Development Plan "Toda Una Vida" which focuses on the provinces of Manabí and Esmeraldas. Within this framework, the EU has designed a Competitiveness Improvement Plan (CIP) for the Cocoa-Chocolate Value Chain with public and private investment of around USD 600 million until 2030, to promote inclusive, differentiated and competitive agro-industrial development in this sector.

Expected production by 2030 is 500,000 tonnes: 40% sustainable cocoa (traceable and certified), 40% premium cocoa (characterised by an excellent aromatic profile) and 20% semi-finished or finished products.

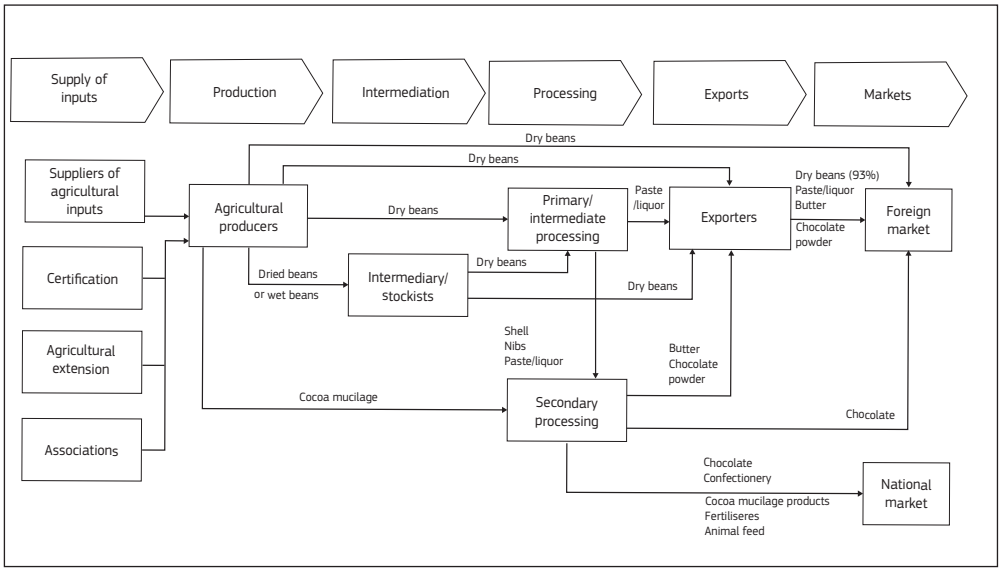

Figure 1: Map of the cocoa value chain in Ecuador

Functional analysis

Cocoa production in the country

Cocoa, the leading permanent crop with 601,954 ha in 2019, accounted for 38% of the country's agricultural area in the period 2014-2019. Dry bean production, which reached **283,680 t in 2019**, has grown at an average annual rate of 15% since 2014.

Several varieties of cocoa are grown in Ecuador, but production is dominated by two main varieties: **"national" cocoa or Fine and Aromatic Cocoa (FAC)** as it is called (43% of the area and 28% of production in 2017) and **CCN-51 clonal cocoa** (57% of the area and 72% of production).

Cocoa is mainly produced on the coast (Figure 2).

Actors in the value chain

There are around 189,000 cocoa production units, of which 98% of production comes from **small scale-farmers** (<20 hectare (ha)).

Intermediary traders, who collect the cocoa and negotiate directly for advantageous prices and quality, are powerful actors in the value chain.

Cocoa industrialisation refers to the processes of preparing semi-finished products (cake, paste or liquor, butter, powder) and finished products (chocolates in various forms) carried out by **primary and secondary processors**.

Exporters consist of around 40 major companies that export beans, and 16 that export processed products. They are the actors that comply most with international quality standards. Only 7% of cocoa exports are made through small producer organisations, of which 80% are considered organic and certified.

Factors limiting production

Ecuadorian cocoa yields range from 0.15 to 1 t/ha, depending on variety and production area. These yields have been increasing since 2016 and are currently on a par with those in Ghana, moderately higher than those in Cameroon and Côte d'Ivoire, but well below those in Peru.

The absence of a national quality and traceability system results in a large share of exports consisting of mixed beans of varying quality, with no fermentation control or classification. Consequently, prices are typically set against the New York or London stock exchange benchmarks (averaging USD 2,430 per tonne in 2019), minus a penalty of around USD 200. In contrast, a small share of "differentiated" cocoa—produced by individual farmers or small producer associations that control the entire production process—commands significantly higher prices, reaching up to 67% above the stock exchange benchmark in 2019.

Cocoa sub-chains

There are two main grain sub-chains, with very different **quality strategies**:

- **An industrial-grade sub-chain** purchases large volumes of CCN-51 cocoa to supply the bulk chocolate industry, but pays low prices to producers. However, quality can be significantly improved through proper post-harvest practices—particularly fermentation and drying—meaning that even medium-quality cocoa can be used to produce high-quality chocolate.
- A **quality-focused sub-chain** targeting **distinct flavours**, purchases FAC cocoa at premium prices and requires controlled fermentation in wooden crates. It preferably sources through collection centres—both private and associative—that buy fresh cocoa beans and carry out professional fermentation, supplying high-value niche markets.

Other important sub-chains include:

- **A semi-finished product production sub-chain** centred around a small group of primary industrial processors who use cocoa blends to produce semi-finished products mainly for the international market. They are mainly supplied by small producers.
- **A premium bean sub-chain** centred on medium-sized producers who produce very high-quality FAC in very small volumes, traded (after careful post-harvest processing) at very high prices on the international market, up to >12,000 USD/t.
- **A sub-chain of semi-finished products and chocolate** that supplies the domestic market.

Across the board, an organic sub-chain also exists, often linked to Fairtrade certification and involving around five to six collection centres, typically associations or cooperatives. However, this segment remains limited in both volume and value, as certification costs largely absorb the price premium on international markets, leaving producers with little incentive to invest in organic certification.

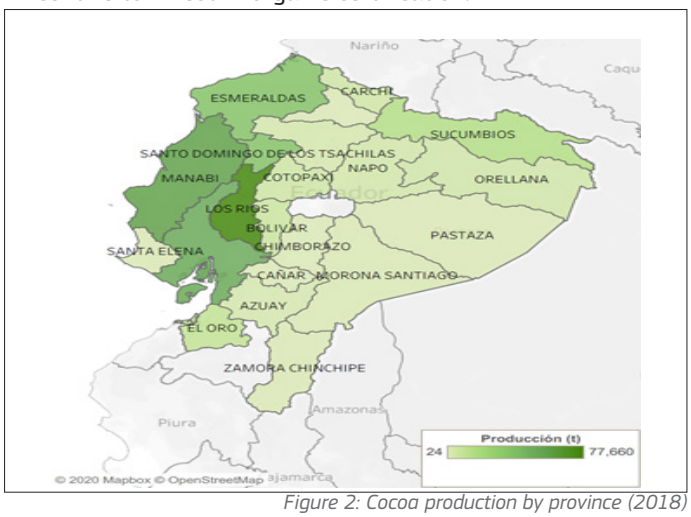

Figure 2: Cocoa production by province (2018)

What is the contribution of the value chain to economic growth?

Profitability and financial viability

The actors who **earn less than $20,000 per year** are mainly producers (small, medium and large), given the low purchase prices paid to producers, but also intermediary traders who do not carry out post-harvest activities.

Actors who earn an **annual profit of between $20,000 and $140,000** are mainly exporters, chocolate manufacturers, and collection centres. This profit allows them to finance (in part) the working capital needed to start purchasing cocoa, remunerate the capital invested in the VC, and make investments or improve their standard of living.

The players who earn an **annual profit of more than $140,000** mainly include exporters of the three main products: beans, semi-finished products and chocolate.

Impact on the national economy

Agricultural production **contributes 90% to direct value added (VA)**, processing 8% and trade 2%. The **total VA of the VC**, i.e. including the VA of input and service providers, is USD 770 million.

The indicator of **integration into the national economy** (total VA/value of production) **reaches 90%**, which means that only $10 needs to be imported to produce $100 worth of cocoa, and that the remaining $90 corresponds to VA, i.e. income for domestic economic actors (producers, processors, traders, suppliers, workers, the State, banks, etc.).

Impacts outside the value chain can also be observed, such as the development of industrial dryer manufacturing. The companies that manufacture these dryers sometimes export them to other countries around the world (Latin America, Asia).

As Ecuador is an oil-exporting country, with oil representing the core of its economy, the cocoa value chain generates approximately 1% of GDP, but **~8% of agricultural GDP** (by comparison, bananas contribute 33% of agricultural GDP). This figure is increasing.

The trade balance of the VC is positive by $751 million per year (difference between the value of cocoa exports and the value of imports of inputs). **The balance of income for the state is also positive by $57 million** (difference between the tax generated and the financing by the state of part of the technical assistance, which is considered as a subsidy).

Sustainability within the global economy

The Domestic Resource Cost Ratio (DRC) assesses the relationship between the cost of domestic resources used in the VC's activities and the economic value generated. It provides an indication of what is paid in 'foreign currency'. **The DRC for Ecuador's cocoa VC is 0.48, which indicates good viability in the international economy.**

The Nominal Protection Coefficient (NPC) provides information on the level of protection afforded to the VC by government pricing policies. It is calculated as the ratio between the price received by producers and the price they would receive if their product were traded on a free market. **The NPC for Ecuador's cocoa VC is equal to 1, which means that there is no distortion of competitiveness in terms of prices.**

Ecuador's competitiveness in recent years has been based on volume and cost strategies related to the use of CCN-51, which has allowed it to increase its share of the commodity market, but not the quality cocoa market. This is a paradox, given that there are companies that achieve very high quality based on FAC, even winning global awards. The main problem is the ability to develop and invest in collective collection centres for small producers. The two main constraints are interest rates and the legislation governing associative structures. **The challenge for Ecuador's territorial competitiveness in cocoa is to improve quality (of FAC and CCN-51) in the medium and long term.**

Vertical integration of the value chain in the production process of semi-finished products and chocolate appears to be an opportunity to increase profits through value addition and its impact on employment. Semi-finished products are considered low-quality commodities, which are not very profitable (collection centres that have invested in processing capacity do not make significant profits and their infrastructure is underused). However, the integration of semi-finished product and chocolate production can generate significant value; this is the strategy adopted by companies such as Ferrero, Nestlé, Kallari and República del Cacao. It may be difficult to supply large industrial centres with high-quality cocoa, as quality production is highly fragmented. A policy to encourage small subsistence producers to become small micro-entrepreneurs, and the latter to become medium-sized producers, would be a factor in improving the long-term supply conditions for a high-quality chocolate industry.

Is this economic growth inclusive?

Income distribution and poverty reduction

For small-scale producers in marginal conditions—who account for more than 80% of actors—the value chain provides a vital source of income and supports access to essential services, including consumer goods, healthcare, social protection and education for their children. For women, it creates employment opportunities, particularly in the processing of semi-finished products and in the chocolate industry. **For native communities**, the VC could pose a threat if it expands into forest areas, but it could also present an opportunity in relation to the possible development of territorial certifications for agroforestry production systems based on FAC.

However, although they generate 25% of the VA, **some small producers** earn less than $500 in annual profits, a very low amount compared to other producers or actors in the VC. These subsistence producers remain **vulnerable**, with little autonomy and high dependence on the purchasing conditions offered by intermediary traders or other cocoa buyers.

Job creation

Wages represent 40.7% of the value of production, demonstrating the importance of employment in this VC.

There are **approximately 390,000** permanent and casual **direct jobs**, dominated by small producers.

The largest contribution to employment comes from production on plantations. Given the high concentration of smallholder farms, the use of family labour increases the number of those working in the VC.

The value chain is of great social importance and is sensitive to the international market. It has a positive socio-economic impact in terms of added value and employment, especially at the level of agricultural producers. Exporters earn the most, but generate the least employment.

Greater inclusion of subsistence producers would be at the heart of a structural transformation that would improve development in marginal rural areas, but also generate a supply of quality cocoa linked to investments in local post-harvest infrastructure. Private and public investments appear to improve the inclusion and sustainability of the value chain in the long term. In this regard, the level of investment in public research is insufficient.

Is the value chain sustainable from a social point of view?

Figure 3 and the table below provide an overview of the main social impacts of VC activities in six strategic areas.

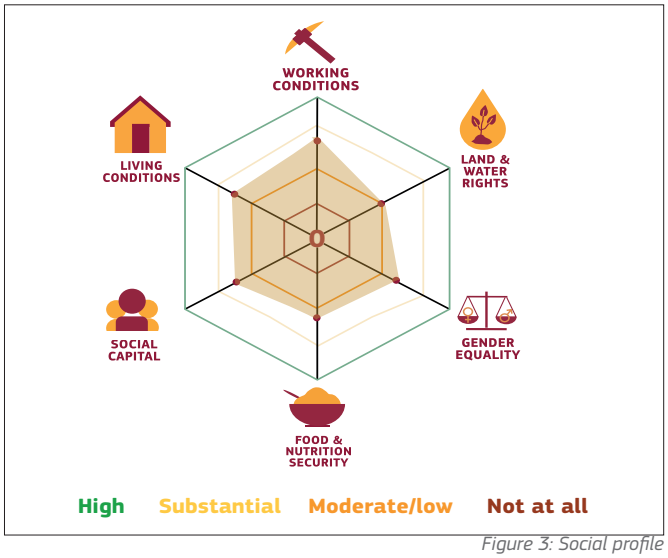

Figure 3: Social profile

Improvements must be pursued in all social areas, even though significant progress has already been made (e.g. child labour, social security and rural pensions). These improvements must focus particularly on increasing the social sustainability of small producers, who are a fundamental pillar of the value chain. Measures at sectoral level are necessary, but not sufficient. They must be accompanied by appropriate measures at the national level, especially in education, food security, health and gender equality.

Working conditions	• Much of the workforce works in informal conditions. • The risk of child labour is low, which can be considered a competitive advantage compared to African countries.
Land and water rights	• There is no threat of large investments. • Agricultural expansion could endanger essential ecosystems such as the Amazon rainforest, although cocoa is not one of its main drivers.
Gender equality	• Lack of gender inclusion in production and trade decision-making processes. • Despite an adequate legal environment, there is little equality in practice.
Food and nutritional security	• Cocoa does not affect the country's food economy, which is relatively self-sufficient. • Agroforestry systems can be an interesting solution for promoting or preserving dietary diversity. • Cocoa can help address some nutritional challenges, given its highly beneficial properties for the body.
Social capital	• Many producer associations have no real economic activity (so-called 'paper' associations set up to obtain benefits; strategic, managerial and technical weaknesses, as well as difficulties in accessing resources, etc.). • Producer associations play an important role in improving cocoa quality and have a positive socio-economic impact on the communities involved.
Living conditions	• In scattered rural areas, a considerable percentage of the population does not have access to decent housing, basic sanitation or safe water. • Poor coverage of rural social security despite a notable effort to extend access to healthcare to the most vulnerable populations.

Is the value chain environmentally sustainable?

Impacts of producers

Impacts per hectare increase along the gradient of cocoa producer types (from small subsistence producers to large producers) (Figure 4). This is due to the levels of intensification associated with different producer types, which more than compensate for differences in yield. Impacts per tonne of large and medium-sized producers are slightly higher than those of small producers, implying that the high yields combined with intensification of the former do not represent an environmental benefit over the low yields and extensification of the latter.

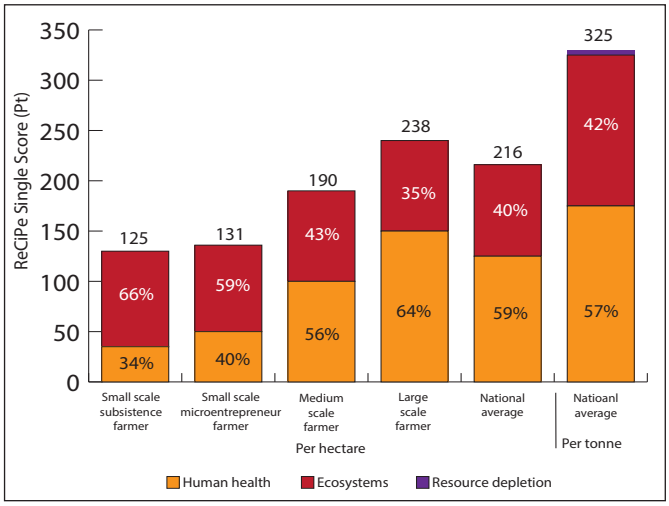

Figure 4: Impacts per hectare by type of cocoa producer and weighted average per tonne

Impacts by region and by technique

Cocoa from the Amazon has a lower impact per hectare than cocoa from other regions. This is partly due to the absence of large producers and the characteristics of Amazonian systems, which are generally extensive with low input intensities. The impacts per tonne are lower for cocoa grown in the highlands and the Amazon region than for cocoa grown on the coast.

The impacts per hectare of monoculture are consistently higher than those of associated systems, despite lower yields, due to the lower intensity of input use in cultural association systems. There are differences between the impacts per tonne of cocoa from different types of associations: although relative yields do not vary, **sequestration in biomass** varies significantly, i.e. it is much **higher in agroforestry systems** than in other associated systems.

With regard **to processing impacts** (post-harvest, transformation), thermal drying has a greater impact than solar drying, and the production of milk chocolate has a considerably higher impact than other types of chocolate due to the impacts inherited from the other ingredients (milk, sugar).

Climate change and biodiversity

In Ecuador, **cocoa farming systems contribute significantly to climate change mitigation** thanks to the large amount of carbon they sequester in biomass and the low or zero association with deforestation. Studies show that deforestation is minimal compared to other countries.

In the Amazon, there are already areas of overlap between different types of cocoa systems and protected areas. **Indigenous communities** that produce via agroforestry systems (e.g. chakra system) are **key players in the preservation of natural and cultivated biodiversity.**

Sub-chains

The sub-chains have different levels of impact (Figure 5) due to differences in agricultural yields and the varieties of cocoa that feed the sub-chains.

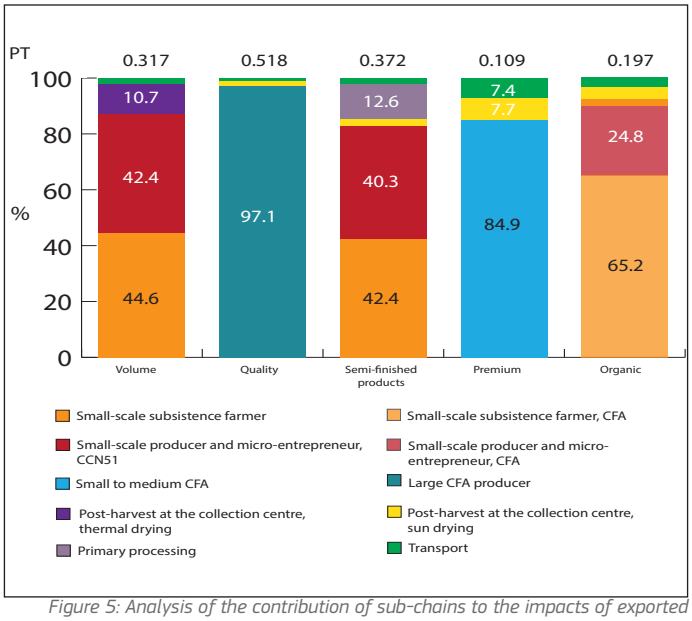

Figure 5: Analysis of the contribution of sub-chains to the impacts of exported products

The cocoa value chain in Ecuador can be considered broadly sustainable: it faces limited pressure from new entrants, contributes to climate change mitigation through high levels of carbon sequestration in biomass that outweigh emissions from land-use change (such as deforestation), and does not currently pose a significant threat to biodiversity. Agroforestry systems are more environmentally sustainable than monoculture. The organic and premium sub-chains are the most sustainable. The vast majority of cocoa is produced by smallholders, and therefore environmental initiatives should focus on these producers, mainly on improving their yields. Such initiatives do not necessarily imply intensification of production. The environmental impacts of Ecuadorian cocoa and cocoa products are considerably lower than those of other international cocoa value chains.

Conclusions

Key issues identified

- **The absence of an integrated quality system** across the value chain results in the blending of different grades, limiting product differentiation and reinforcing a focus on commodity (volume) markets.
- The **difficulties** faced by small-scale farmers in **accessing sustainable and more productive agricultural technologies.**
- **Insufficient access to public and private credit** for the primary link (producer organisations, collection centres) for two main purposes: to finance the time difference between the actual payment of cocoa to the producer and the payment by cocoa buyers on arrival at the port of destination, and to finance investments in fermentation infrastructure.
- **Large number of small, fragmented producers** (small in size and without collective organisation) scattered across different geographical areas.
- **Limited public** technical assistance **services** for cocoa production on farms.
- Marketing and post-harvest storage actors are insufficiently integrated around quality standards and incentives.
- **Absence of a strong policy** to promote added value in the value chain.

Risks

- **Growing influence of "commodification"** of production in the Amazon region (deforestation, loss of biodiversity) due to the activities of large transnational corporations operating in the country.
- **Lack of continuity and instability in public policy** support for the VC from the State.
- **Potential displacement of the market** by Latin American competitors with dynamic and sustained processes of productive growth.
- Short-term **instability in the international base price** of cocoa.
- Intensification of production-related impacts resulting from **climate change**.
- **Replacement of cocoa** with other more profitable legal (and illegal) crops.
- **Unfavourable macroeconomic environment** for attracting investment in the sector.
- Evolution of international standards on **cadmium and deforestation**.

	Key issues			Impacts		
Specific recommendation	Consolidate quality in the chain	Increase national value addition	Improve, institutional quality	Economic	Social	Environmental
Improve/adapt/consolidate legislation	x	x	x	x	x	
Facilitate access to credit	x	x		x	x	
Improve productive infrastructure	x	x		x	x	x
Promote the modification of international standards	x	x		x		
Reduce the negative impact of cadmium	x	x		x		
Improve certification systems (e.g. territorial)	x	x	x	x	x	x
Prioritise agroforestry systems in environmentally sensitive regions	x			x	x	x
Establish a national traceability system	x	x		x	x	
Solidify emergency processes and the development of productive clusters as drivers of innovation, GMPs and GMP	x	x	x	x	x	x

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Agrinatura (http://agrinatura-eu.eu) is the European Alliance of Universities and Research Centers involved in agricultural research and capacity building for development. The information and knowledge produced through the value chain studies are intended to support **the Delegations of the European Union** and their partners in improving policy dialogue, investing in value chains and better understanding the changes linked to their actions. VCA4D uses a systematic methodological framework for analysing value chains in agriculture, livestock, fishery, aquaculture and agroforestry. More information including reports and communication material can be found at: https://europa.eu/capacity4dev/value-chain-analysis-for-development-vca4d-

This document is based on the report by Avadí A., Temple L., Blockeel J., Salgado V., Molina G., Andrade, D., 2021. Análisis de la cadena de valor del cacao en Ecuador. Only the original report binds the authors.