European Commission

VCA4D
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

N°37
JULY 2022

Analysis of the cocoa value chain in Nicaragua

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://europa.eu/capacity4dev/valuechain-analysis-for-development-vca4d-/documents/methodological-brief-eng). It aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

The value chain context

Although cocoa does not play a major role in Nicaragua's agricultural economy, this crop is important in certain territories and presents a great opportunity for adaptation to climate change, particularly in coffee-producing regions. It also allows trees to be reintroduced in areas where extensive cattle farming is practised or where the forest has been degraded.

Cocoa production is mostly done by small producers, often organised in cooperatives, although large plantations have also developed and are making an increasing contribution. Cocoa has progressively become a profitable crop for the actors in the chain, driven by efforts to obtain high quality cocoa. Although there remain weaknesses in the sector and threats, particularly social and environmental, cocoa offers opportunities for sustainable development.

The European Union intervention

The European Union (EU) intervenes in Nicaragua in the areas of poverty reduction and inclusive and sustainable development based on peace, democracy and the consolidation of the rule of law. Its actions include support for the agricultural sector to adapt to climate change. The EU particularly focuses its interventions in rural areas, in coordination with donors and public policies.

The EU in Nicaragua proposed to establish a baseline to discover the state of the cocoa value chain (VC) at the economic, social and environmental level, and to think about future support to the VC, in particular in the framework of the 2021-27 programming, on the actions of Team Europe for the Green Deal.

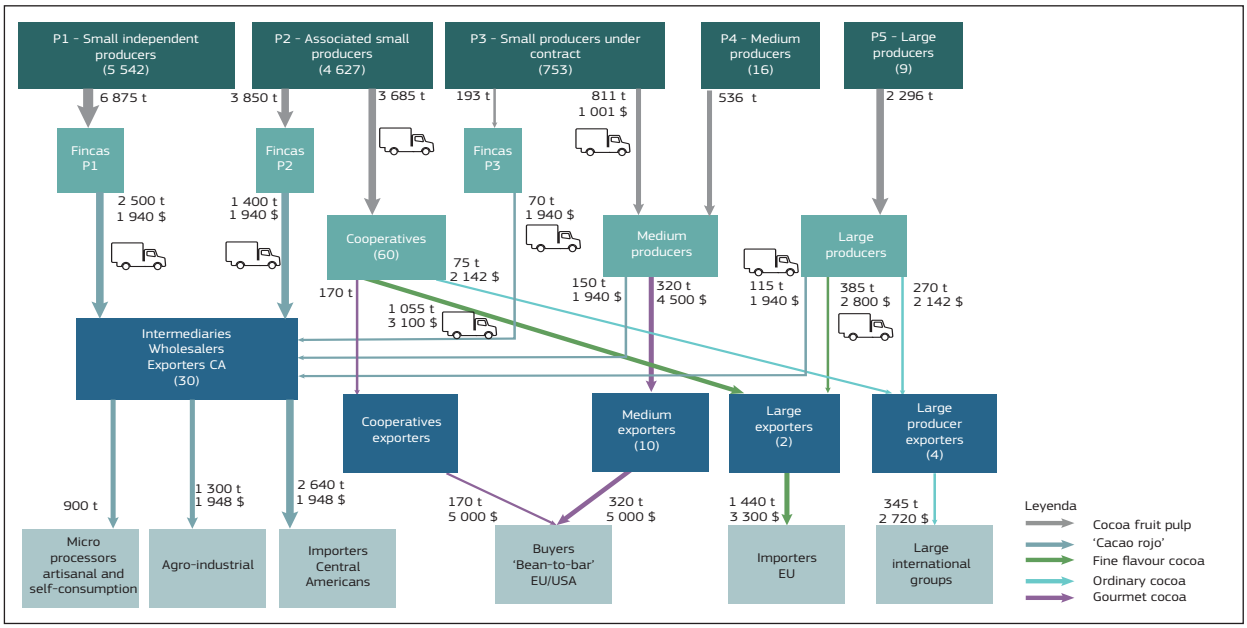

Figure 1: Main actors and flows in the cocoa value chain in Nicaragua

Functional analysis

Cocoa production and marketing

Cocoa is a traditional crop in Nicaragua, as in the rest of Central America. Since the 1990s, with the arrival of a German company, the cocoa sector was developed, which has made it possible in particular to promote drying and fermentation processes in cooperatives of small producers in order to promote international exports. As a result, production has risen sharply over the last decade (+18% annually). It reached a volume of **7,500 t in fermented cocoa equivalent in 2020**.

Most Nicaraguan cocoa is exported (68% of production). A distinction is made between '**cacao rojo**', which comes from **cocoa fruit pulp** after washing and minimal drying, with very little fermentation; and **fermented cocoa**, which is the result of a first transformation of the pulp (washing, fermentation and drying). Mostly 'cacao rojo' is exported to Central America (36% of production), and fermented cocoa to Europe and North America (32%). Cocoa is also consumed domestically, after its second transformation (artisanal and industrial). Nicaragua imports 3,300 t of cocoa, mainly derivatives such as chocolates (95% of imports) and cocoa powder.

The main actors in the value chain

There are **more than 22,000 cocoa producers** at national level (8.4% of the total number of farmers), of which only half are commercial producers. There are 5 different profiles of commercial cocoa farmers (Figure 2):

- **Small independent producers with traditional agroforestry system (AFS)** selling mainly 'cacao rojo' for the domestic market or regional export (P1);
- **Small producers with traditional AFS associated in cooperatives** selling mostly pulp for processing as fermented fine flavour cocoa at their cooperatives for export to European markets (P2);
- **Smallholders with traditional AFS under contract with medium-sized exporters** selling mostly gourmet cocoa pulp for export to international niche markets (P3);
- **Medium-sized producers with semi-intensive AFS**, selling mainly 'cacao rojo', but also fermented gourmet cocoa for export to international niche markets (P4);
- **Large producers with technical AFS** selling fermented cocoa (fine flavour and ordinary) for export to international markets (P5) via large exporting companies or directly.

Profile and No. of producers	Areas in development (ha)	Production areas (ha)	Areas prod. /producer (ha)	Total production dry eq. (t)	Average dry eq. yield (kg/ha)
P1: 5,542	4,342	7,726	1.39	2,500	324
P2: 4,627	1,695	6,010	1.30	2,740	456
P3: 753	358	1,000	1.33	365	365
P4: 16	190	481	30	195	406
P5: 9	2,982	2,327	258	835	359
TOTAL: 10,947	9,568	17,543		6,510	

Figure 2: Profiles of commercial cocoa producers

Sixty **cocoa cooperatives** were identified that buy cocoa beans on behalf of their members. Some have their own collection centres and fermentation and drying infrastructure (31), enabling them to sell to international exporters. The cooperatives incorporate more than 6,240 producer members.

A myriad of informal **cocoa collectors/intermediaries**, sometimes called "coyotes", buy 'cacao rojo' to sell to **traders** in the country's markets, who may even be Central American exporters.

Two types of **exporters** can be distinguished: large enterprises (4), generally subsidiaries of international chocolate companies, which buy large volumes of cocoa with specific quality requirements, and export around 1,800 t per year; medium-sized companies (~10) which buy small volumes (320 t per year), and value the "territory connotation" of high quality cocoa for niche markets ("gourmet" or "bean-to-bar" chocolate production).

Main sub-chains

In addition to the '**cacao rojo' sub-chain**, there are several fermented cocoa sub-chains: 1) the **fine flavour cocoa**: a fermented cocoa with a standard protocol associated to the main exporter in the country, which can be certified with several seals (RainForest Alliance and UTZ mainly); 2) the **gourmet cocoa**: fermented cocoa with special protocols of medium-sized exporters, who only sell in high-quality niche markets, with or without certification (often with organic and/or fair trade seals); 3) **ordinary cocoa**: fermented cocoa generally produced on large plantations and exported by large exporters, which are sometimes the same (vertical integration).

Regulation in the value chain

Public-private coordination at the national level has been discontinuous, particularly after the socio-political crisis of 2018. Due to its size, the VC in Nicaragua has not had a strong capacity to influence the political agenda, despite its recent inclusion in the national development strategy. Consequently, the VC is not highly regulated in Nicaragua, and **many of the rules and norms that influence the VC are private and come from exporters** who impose their quality standards.

What is the contribution of VC to economic growth?

Cocoa transaction prices

The cocoa price system in Nicaragua is indexed to that of the **New York Stock Exchange**. This price serves as a **reference for the exporting company** that buys the largest volumes of cocoa in the country. In 2021, fine flavour cocoa exported by large exporters and UTZ/RainForest certified, ranged between US$ 2,600 and US$ 2,800/t, and gourmet cocoa destined for niche markets ranged between US$ 3,600 and US$ 4,500/t. The price of cacao rojo paid by brokers is estimated at around 80% of the reference price on the New York Stock Exchange (US$ 1,980/t). The price of cocoa beans paid to the producer varies widely, ranging from NIO 10 (€0.24)/lb (uncertified) to NIO 16 (€0.38)/lb (with certification). During the year, the price is set by demand from buyers in Central America (mainly El Salvador and Guatemala).

Financial viability of the actors

VC is profitable for most actors, to differing extents (Figure 3). However, the **annual per capita net income of smallholders is relatively low** compared to the minimum wage in the agricultural sector (NIO 4,415 or €106 per month in 2021). Currently, **large producers generate negative income** as they are amortising their recent investments, and have not reached full production capacity, which is a temporary rather than a structural situation.

Contribution to economic growth

Despite being a traditional sector, the cocoa VC does not add much in terms of total value added (NIO 604 million or €14.5 million). **The contribution to national GDP and agricultural GDP is respectively 0.15% and 0.96%.** The sub-chain that contributes most to the creation of direct value added is "cacao rojo", followed by fine flavour cocoa (Figure 4). The VC does not have a large number of producers either (Figure 2).

The contribution of the VC to public finances is low (NIO 9.7 million or €233,000), because a significant part is informal and large formal enterprises are located in tax-advantaged free trade zones, the VC does not receive significant public support (NIO 1.6 million or €38,400). As subsidies are lower than taxes paid, **the VC in turn benefits from public funds** (NIO 8.1 million or €194,400).

With regard to viability in the international economy (nominal protection coefficient of 0.99 and domestic resource cost of 0.52), there is not much protection on the domestic market, and **cocoa can compete in the international market**.

Indicator	Net annual income	Net monthly income	Benefit/Cost Ratio
P1	NIO 19,694 /€473	NIO 1,642 / €39	90%
P2	NIO 30,299 /€727	NIO 2,525 / €61	108%
P3	NIO 29,037 /€697	NIO 2,420 / €58	107%
P4	NIO 155,645 /€3,736	NIO 12,970 / €311	6.6%
P5	NIO -3,562,199 / -€85,493	NIO-296,850 / -€7,124	-32%
Cooperative	NIO 85,945 /€2,063	NIO 7,162 / €172	3.5%
Medium-sized exporter	NIO 134,566 /€3,230	NIO 11,214 / €269	31%
Large exporter	NIO 1,287,500 /€30,900	107,292 / €2,575	32%
Trader Exporter	NIO 66,228/1,589€	5,519 / €132	43%

NIO = Nicaraguan Córdoba

Figure 3: Financial indicators by actor

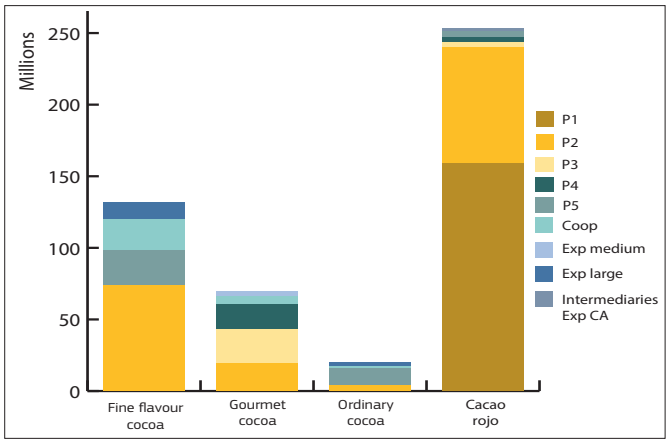

Figure 4: Direct value added by sub-chain

Balance of Trade

The VC is largely geared towards bean exports, both to Central America, Europe and the United States. **The trade balance of the VC is positive** (NIO 357 million or €8.6 million), as the value of cocoa exports (NIO 471 million or €11.3 million) is higher than the import cost of some inputs (NIO 114 million or €2.7 million).

The country also imports NIO 355 million (€8.5 million) of cocoa derivatives (chocolates and cocoa powder). These products do not compete with domestic products as they are of low quality. Thanks to the increase in export volumes, **the imbalance in the cocoa trade balance has been reduced**. Cocoa imports, although accounting for 56% of the total cocoa volume, represent almost the same value as cocoa exports. This is logical given that we are comparing processed products versus cocoa beans (raw material).

The income of small producers is low compared to the agricultural minimum wage, and large producers have not yet made their investments in cocoa profitable. The production level of the large plantations is still insufficient to have a structuring effect on the national economy. However, the situation could change in the coming years. Nicaragua imports processed cocoa-based products, while its exports are increasing and there are some sub-chains of national processors that are positioning themselves in niche markets for quality cocoa at high prices.

¿Is the economic growth inclusive?

Income distribution

At the aggregate level, **small producers receive 66% of net income** (29% for independents and 37% for associates), followed by salaried workers (31%). However, **it is the large exporters that generate the most income per capita**, followed by medium-sized exporters (Figure 3).

This distribution of income varies strongly according to the sub-chain. The "cacao rojo" sub-chain generates higher income (68%) given the volume it represents, but less value added per capita. Cooperativism in the fine flavour cocoa sub-chain, linked to large exporters, has strengthened producers and improved their living conditions. With the development of large plantations in recent years, the dynamics of the sector could change rapidly with more competition and less bargaining power of small producers vis-à-vis large exporters. On the contrary, the evolution of the ordinary cocoa sub-chain seems to be more limited as it involves only large producers, integrated into international groups. The gourmet cocoa sub-chain has better revenues, as it is oriented towards niche markets and offers better prices to producers.

Jobs and attractiveness

One third of the jobs are casual labourers in the field, while **more than half are permanent workers in the cooperatives** and large plantations (field and profit work), the rest in the business. **Female employment is minimal**, accounting for only 11% of the total number of people involved in the VC.

The VC is attractive in comparison to others, despite wages below minimum wages (except for formal workers). **The VC could involve more young people and women**, who continue to suffer from unfavourable structural conditions (access to land and credit in particular). This situation goes far beyond the cocoa dynamic.

From an inclusion point of view, the results are mixed. Incomes benefit mainly small producers and workers, but with low per capita incomes and wages. Income distribution varies strongly by sub-chain. Although attractive, few women and youth are involved despite efforts to promote their participation, particularly in cooperatives and production. Also, despite the location of production mostly on the Caribbean Coast, few indigenous people participate in the cocoa chain, or at least their production is not commercial.

¿La CV es socialmente sostenible?

Figure 5 and the following table provide a picture of the context and risks in 6 strategic social domains.

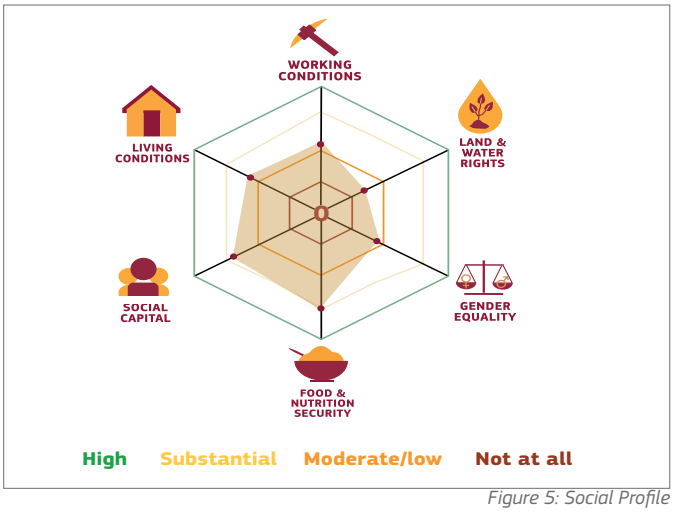

Figure 5: Social Profile

Working conditions	• Globally respected labour rights, in particular for formal employment. • Informal employment in the absence of effective trade union organisation. • There is no evidence of forced or child labour. • There is no evidence of mechanisms to protect people with regard to hazardous work and occupational safety, except in large companies.
Land and water rights	• Strong dynamics of large-scale land investments, particularly on the Caribbean Coast. • There is no evidence of lack of respect for property rights, even if structural problems of security of tenure persist.
Gender equality	• Few women in production (little access to land and credit, macho and violent society against women, especially in rural areas). • Active participation by some women in the cooperatives, in the collection of red cocoa or in the manufacture of chocolates and derivatives. • Women have little control over income, except when they have salaried jobs. • Few women in leadership positions in the chain.
Food security and nutrition	• Active participation in food security in the production territories in terms of availability (production of various foodstuffs in the diversified FFS plot) and access (income generation, although cocoa is not the largest item in the production systems). • Cocoa enables year-round income generation, and improves access to food.
Social capital	• In the "fine aroma" system, cooperatives are key actors. However, their bargaining power with the exporting companies is low. • Recent structuring of the multi-stakeholder and multi-level VC, albeit chaotic (deterioration of relations between private and public actors after 2018). • Circulation of information and trust between chain actors not optimal. • Little participation of rural communities in decision-making.
Living Conditions	• Living conditions in the cocoa-growing areas, as in the rest of Nicaragua, are difficult: insufficient access to infrastructure and health services, housing in humble traditional houses (the quality of which has been improved thanks to the income from cocoa), poor access to water and sanitation. • Improvement of vocational training by large companies and external cooperation. • Significant migration out of cocoa-growing areas, with cocoa representing an alternative to going to the cities and abroad.

¿Is the VC sustainable from an environmental point of view?

The environmental analysis of the VC is based on the Life Cycle Assessment methodological framework. The study focuses on two products: red cocoa and fermented cocoa. The VC was assessed considering 1kg of dry cocoa delivered to the exporters' warehouse as a functional unit. Three main stages were considered: cocoa cultivation, processing (collection, fermentation, drying, packaging) and marketing or transport from the processing plant to the warehouse of the intermediaries or exporters (land transport).

Impacts on protection areas

The cultivation stage dominates the environmental footprint of the chain (between 79% and 100% of the damage). The results clearly emphasise the role of mineral fertilisers, both because of their manufacture and the emissions generated by their use. This role is even more significant in more intensive systems and even if productivity is higher, as fertilisers contribute directly to the formation of fine particles and climate change, the main impacts on human health. Mineral fertilisers also contribute to resource depletion through the use of fossil fuels for their manufacture.

Smallholders have greater impacts on ecosystem quality because they require more land use (main contributor) per functional unit due to lower yield levels.

The issue of crop residue management is equally significant. Degradation generates CH4, CO2 and N2O emissions, which contribute to climate change, ozone formation and marine eutrophication.

Carbon sequestration by agroforestry systems is positive, allowing to mitigate almost 70% of the contribution to climate change of smallholders, and 30% in the case of medium and large producers, due to their higher emissions (Figure 6).

Impacts of the sub-chain

Although less economically and socially sustainable, the "cacao rojo" sub-chain is less environmentally damaging. The ordinary cocoa sub-chain is the most environmentally damaging, due to the cocoa volumes of large producers (P5). Between these two extremes, the fine flavour cocoa sub-chain has greater impacts than the gourmet cocoa sub-chain, but

The environmental sustainability of the value chain is mixed. Traditional smallholders with agroforestry systems perform better, in particular smallholders associated in cooperatives (P2) given their better productive yields. There are positive prospects for small producers associated (P2) or under contract (P3) both in terms of productivity and better agronomic practices; this allows their contribution to environmental impacts to be reduced. On the other hand, the rapid and recent development of medium and large-scale producers is more worrying in terms of land use change, the use of agrochemicals and the consequences of irrigation on the environment (fertility, soil quality and water resources in particular). However, from the perspective of the impact of climate change on cocoa production activities, the current evolution of the value chain and the resilience of some production situations can be questioned.

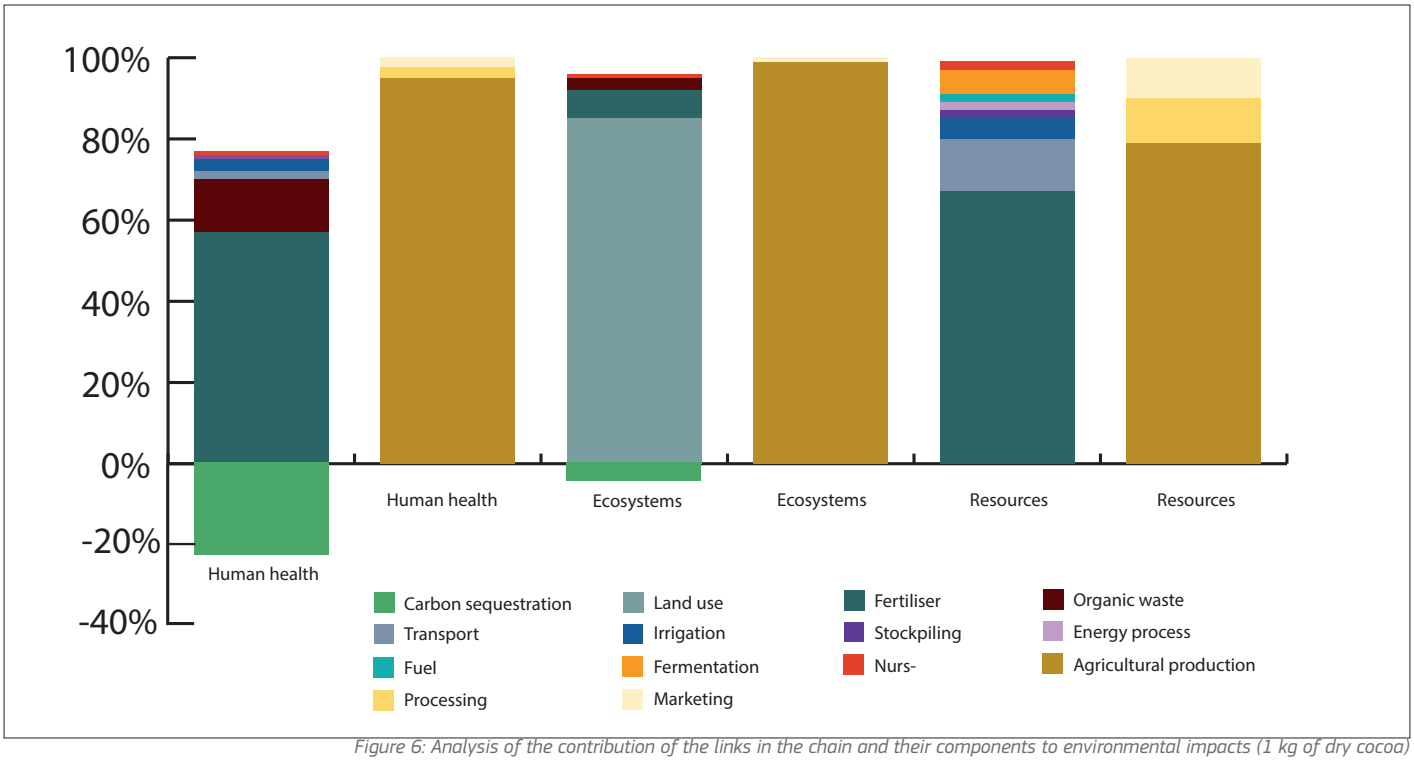

Figure 6: Analysis of the contribution of the links in the chain and their components to environmental impacts (1 kg of dry cocoa)

Conclusiones

Cross-sectional analysis by sub-chain

The sustainability analysis between the sub-chains varies depending on the prioritisation of the dimensions.

The contribution to economic growth would be better in the case of fine flavour cocoa and gourmet cocoa, but the negative results for the ordinary cocoa sub-chain are temporary as the plantations have not yet reached their optimal production.

In terms of economic inclusion, it is the fine flavour cocoa and ordinary cocoa sub-chains that stand out positively.

In terms of social sustainability, the 'cacao rojo' sub-chain would be the most problematic with regard to labour conditions (informality), land rights (tenure insecurity) and gender equity. For the other sub-chains, the following problems are highlighted: large-scale facilities in the case of ordinary cocoa, fragile working conditions and land tenure insecurity in the sub-chains involving smallholders. The fine flavour cocoa sub-chain is more equitable for women and young people, labour conditions are more favourable in the ordinary cocoa sub-chain (formality of wage labour).

In terms of environmental sustainability, in terms of human health impacts, the 'cacao rojo' sub-chain performs better (contribution to climate change mitigation); in terms of ecosystem impacts, the ordinary cocoa sub-chain is better (better yields); in terms of resource impacts, the 'cacao rojo' sub-chain is better (less land use).

Main recommendations

To increase the areas and productivity of cocoa farmers, and cocoa farmers, with environmental conditionalities, including genetic improvement and rehabilitation of plantations, favouring investment in their management through technical **assistance aimed at promoting agro-ecological practices** (optimising the use of farm resources to reduce the use of chemical fertilisers...) and improve access to targeted financing for working capital. Promote the regularisation of land tenure to accelerate the correct use of soils in favour of more environmentally friendly agroforestry systems.

Favour agro-ecological practices in agroforestry systems and organic production, revaluing the efforts of producers with these practices in prices, in order to promote the difference in quality of national production with respect to international competitors and to access more profitable markets.

Strengthen the management of environmental impacts in agroforestry systems and risk management. Strengthen resilience and promote adaptation measures to vulnerability to climate change variability.

Develop the capacities of all actors in the chain to promote a brand of a country producing high quality fermented cocoa, based on a logic of family farming, linked to various "territories of origin" and environmental care, improving traceability (including genetics), promoting an inclusive and active structuring of the actors, supporting the institutional and managerial development of cooperatives.

Experiment with and expand an ecosystem services market for diversified FFS, including carbon sequestration, water management and biodiversity credits, enhancing the empowerment and inclusion in productive activities of women and youth in all links of the chain.

Support the development of cooperatives and strengthen coordination between chain actors. Strengthen cooperatives in terms of management, accounting and financial management (including liquidity), governance and transparency, service provision. Strengthen, ensuring transparency, equity, inclusion (in particular of youth and women) with active participation of small producers.

Value Chain Analysis for Development (VCA4D) is a tool funded by the European Commission / INTPA and is implemented in partnership with Agrinatura.

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 "Análisis de la cadena de valor de cacao en Nicaragua." 2022, by Fréguin-Gresh, S.; Feschet, P.; Gomez, M.; Orozco Aguilar, L.. for the project Value Chain Analysis for Development Project (VCA4D CTR 2016/375-804) funded by the European Union, DG-INTPA. Only the original report binds the authors.

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of the following information. The contents of this publication do not necessarily represent the official position or opinion of the European Commission. Directorate General International Partnerships - EuropeAid, Rue de la Loi 41, B-1049 Brussels; July 2022. For further information: https://ec.europa.eu/international-partnerships/home_en