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VALUE CHAIN ANALYSIS FOR DEVELOPMENT

Banana value chain analysis in the Dominican Republic

Value chain analyses assist in informing policy dialogue and investment operations. They help the understanding of how agricultural 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/value-chain-analysis-for-development-vca4d-/wiki/1-vca4d-methodology). It aims to understand to what extent the value chain allows for inclusive growth and whether it is both socially and environmentally sustainable.

The value chain context

The Dominican Republic is a major banana producer, mainly for export and for markets in Europe. In 2019, around 80% of the surface cultivated with bananas was devoted to organic production or in transition (not yet certified).

Banana production in the Dominican Republic (DR) revamped since the country's adhesion to the Cotonou Agreement in 1990, as this granted access to the EU markets under the favorable conditions reserved to the ACP (African, Caribbean, Pacific) countries. The country is nowadays the main world producer of organic bananas and the main exporter of organic and fair-trade bananas to Europe.

Nevertheless, the value chain (VC) faces several challenges. As demonstrated by floods, hurricanes and droughts, climate change impacts the agronomic management, the productivity, and the profitability of farms, and, consequently, the social conditions of VC actors. Another challenge is represented by the high international competition due, on the one side, to the new tariff regime in the EU market, and, on the other side, to the attention that consumers give to production and certification issues.

The European Union intervention

The EU has supported the banana VC via the Banana Accompanying Measures (BAM) programme (2014-2018) for a total amount to the DR of €16 million. The BAM is a support package for various banana exporting countries in the ACP group, that had the objective to facilitate adjustments to a new trade environment, created by the generalised cuts to bananas import tariff to Europe. Actions of the programme in the DR focused on an increase of the competitiveness of the banana sector (including a component on access to credit); an improvement in the organisation of the sector; and a support to the improvement of working conditions.

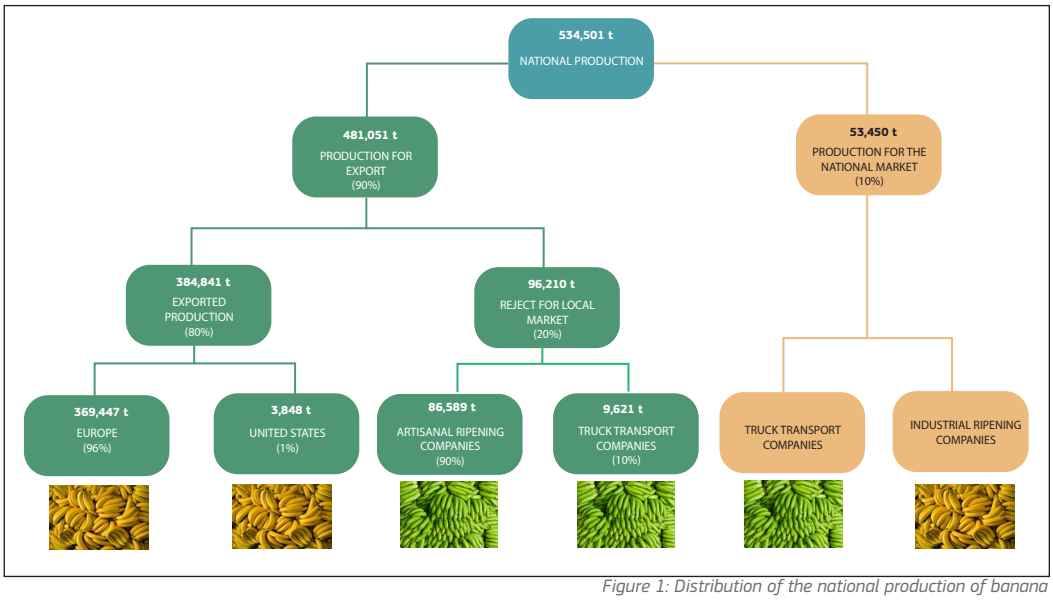

Figure 1: Distribution of the national production of banana

Functional analysis

Production and export

Although fluctuating from one year to another, due to the impact of floods and droughts, **the annual national production of banana** (of the Cavendish variety) is estimated at around **550,000 t**. **90% of the production targets export** (of which 80% is effective export and 20% reject) while only 10% targets directly the national market. The peculiarity of DR banana VC is the **strong orientation to organic and fair-trade certifications** (respectively 80% and 90% of exported volume). The consequence is the organisation of the sector with **a big number of associations and cooperatives that involve producers** (quality control, fair trade premium, technical assistance, etc.).

Producers

In recent years, there has been no presence of multinational companies on-site and **the VC is mostly developed around small- and medium-scale producers**. Out of the 1815 farms working in the VC, 81% are small-scale producers (<10 ha of banana) and almost 60% are small landowners with less than 4 ha. However, small-scale producers only cover 31% of the total cultivated area (Table1). The number of farms is increasing.

The north-east region (Línea Noroeste) is the main producing basin, with a concentration of producers in the provinces of Montecristi (38%) and Mao-Valverde (31%). There is also banana production in the south of the country, in the province of Azua, by very small-scale producers (27% of them representing only 5% of the total cultivated area) (Figure 2).

Export companies

Export companies (24 in the country) **play an important role in the development of the banana VC.** They have contributed to increase the banana supply on the international market, and they have raised the production quality requirement. They also provide assistance to improve the production standards, via the management of the harvest and of packaging activities. Additionally, they offer a range of services to producers, including technical and logistical support, capacity building, loaning, quality control in the fields and at the export docks, internal auditing assistance, funding of aerial cables to transport bananas and packaging machines. They also provide inputs, via credit or at cost.

Category of producers	Surface of the farms (TA)	Number of producers		Total surface in the country (TA)	
Small-scale producers	<65	1 022	57%	30 478	12%
	65-130	330	18%	31 488	12%
	130-160	122	7%	17 726	7%
Medium-scale producers	160-400	243	13%	55 991	22%
Large-scale producers	>400	98	5%	117 765	47%
TOTAL		1 815	100%	253 488	100%

Table 1: Classification of producers according to the size of the farms in 2019
TA = tarea (16 TA = 1 ha)
Source: Experts' elaboration based on the National Banana Register

World market and prices

The banana sector was historically dominated by vertically integrated large-scale companies that controlled all operations across the VC (production, packaging, shipment, import and ripening) in order to have a good position in the global market. More recently, some retailers could enter the market thanks to a competitive supply of sea transport services, the development of technical quality standards (particularly GlobalGap) by the supermarket chains as well as the deregulation by the EU of the banana market since 2006. The new competition among the big banana companies moved the center of power to a VC increasingly driven by retailers rather than by integrated vertical companies.

This change had a huge impact on prices. There is a trend toward the stagnation of prices to consumers in Europe and a slight increase in real terms. On the contrary, the wholesale price and the CIF price (entry port to the EU) decreased. Unfortunately for VC actors, **crises due to decreasing prices become more and more recurrent and intense.**

Beyond the falling prices, one factor that impacted the most on banana producers and workers was the **significant increase of the cost of living and of production** (up to 300% since 2001). This context shows the importance of promoting certifications either of fair trade or of organic and biodynamic agriculture that can assure a better price, even though this advantage is decreasing.

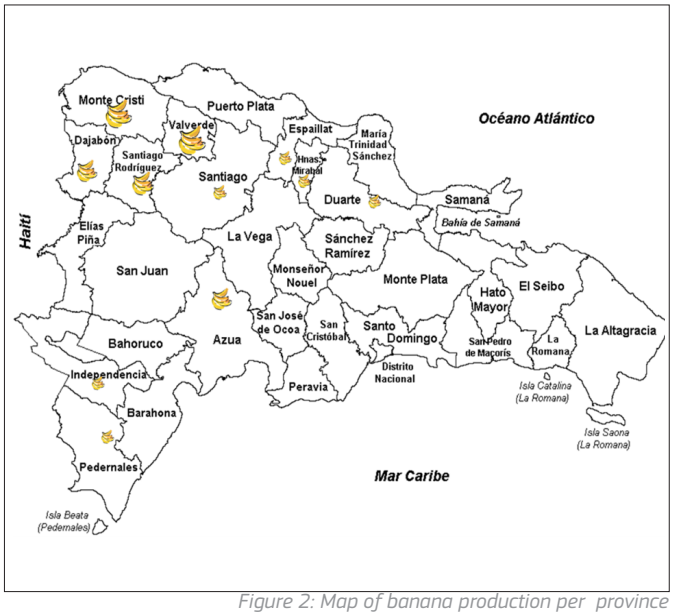

Figure 2: Map of banana production per province

Economic analysis

Profitability for the actors

The sector is attractive because it generates weekly operating profits. This pushed many small-scale producers to switch from rice to banana production, thus justifying the growth dynamic in the chain.

At production level, the monthly net operating profit (NOP) varies between 11,700 RD$ (€192) for a conventional small-scale producer, and 1.9 million RD$ (€31,000) for an organic large-scale producer. The monthly NOP of an organic small-scale producer is around 18,500 RD$ (€304), followed by the conventional medium-scale producer with 14,200 RD$ (€233). **The NOP for producers is** above the national minimum salary in the private sector, although it remains **lower than the cost of the family basket for small-scale producers** (conventional or organic) **and conventional medium-scale producers**. The returns on turnover are depending on the size and on the management of the farm, varying from 3% for conventional medium-scale producers to up to 35% for organic large-scale producers. **There is evidence of the advantage of the double certification (organic and fair trade)** both at individual level, when considering the NOP of producers, as well as at the community level, given the benefits and social investments allowed by the premium from the fair-trade certification.

Labour force is the main contribution to costs (between 32% and 47% of the total costs), especially for the activities of weeding and suckers' removal, followed by inputs and fertilisers (between 24% and 31%). Services represent between 16% and 27% of the costs, among which a large part is the cost of membership to associations.

At commercial level, the NOP varies from 1,234 RD$ (€20.3) per t for an exporter to 5,180 RD$ (€85.1) per t for a ripening company. However, **the returns on turnover are highly contrasted**, going from 3% to 26%, namely a profit for each box equivalent (18.14 kg) of €0.39 for an exporter, €0.72 for a truck transport company and €1.64 for a ripening company.

Macroeconomic impact

The **total value added (VA)** of the VC was **11.3 million RD$ (€186 million)** in 2019, representing **7.5% of the agricultural GDP** and less than **1% of the national GDP.** The contribution to the national economy is limited but is significant at provincial level. Given the informality of the sector, **the contribution to the public finances is marginal.** On the contrary, the VC **contributes positively to the balance of trade** considering the export-orientation of the chain.

The **total VA is mainly generated by the national economy** (rate of integration into the national economy of 71%). However, the import rate (29%) reveals the **dependence of the country on imports** especially of fertilisers, chemicals and fuel.

The Domestic Resource Cost (DRC) of the VC is lower than 1, indicating a gain for the country because **the economic value generated by the VC**, measured at the international prices, **is higher than the costs of the domestic factors invested for production**. The Effective Protection Coefficient (EPC) is lower than 1 (0.88), indicating **a comparative advantage** but also that the profits are lower than they would be without public policies and using international prices. This explains the difficulties faced by producers, especially small-scale ones, because they rely on high level of imported consumables paid in dollars.

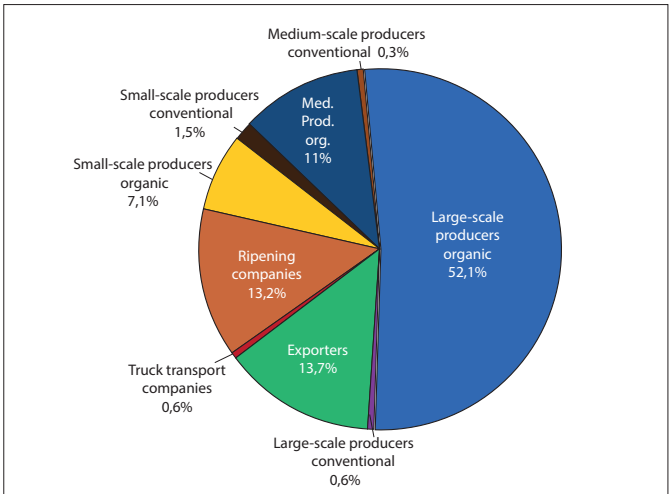

Figure 3: Distribution of the net operating profit by type of actor

WHAT IS THE CONTRIBUTION OF THE VALUE CHAIN TO ECONOMIC GROWTH?

All the actors involved and the whole national economy would benefit from a growth in the value chain because it generates significant and regular profits for a number of small-scale producers and many workers whose activities are rooted in the local economy. Nevertheless, there is uncertainty related to the commercial and climatic changes impacting the chain. If the situation remains unvaried, only the more efficient producers (those with higher productivity and technical skills) will be able to compete while small-scale producers will be in a vulnerable position.

With an increase in productivity there are opportunities for small-scale producers to obtain sufficient operating profits to sustain the needs of their families. This would also benefit workers whose status can be formalised giving them access to social benefits. In recent years, private actors in the value chain have being focusing their efforts in this direction. The integration of the banana value chain into public policies as well as in commercial negotiations on minimum selling prices, would support these efforts. However, important obstacles as the dependency on imported inputs undermine the cost of production.

Social analysis

Figure 4 and the following table provide an image of the situation of the VC in the six strategic domains covered by the social analysis.

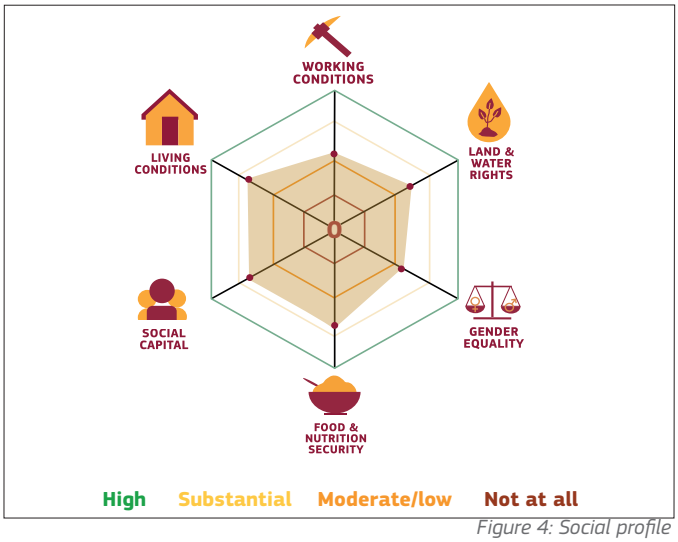

Figure 4: Social profile

Working Conditions	• Labour rights in the banana VC are better than in other VC, even though challenges persist particularly for informal migrant workers. • Child labour in the banana sector is not perceived as a challenge. • Labour security is moderate due to the low level of awareness about the health risks for workers, especially for women. • The VC is attractive but with low level of engagement of the youth.
Land and Water Rights	• There is no evidence of recent cases of land expropriation at large-scale in the banana VC. However, the increasing land transfer from small-scale to medium and large-scale producers could jeopardize the situation of the former. • There are critical risks related to climate change, natural disasters and water scarcity.
Gender Equality	• Women are active in the banana VC mostly as producers and workers, with a concentration in some segments such as packaging activities. • Lower access of women to land, to land titling and to credit. Scarce participation in the decisions concerning production. • Leadership and empowerment are limited, particularly for female workers. • Women have a double workload, but they are exempted from the more arduous tasks in the field.
Food and Nutrition Security	• Even though the export market is more profitable, bananas are available in the local market. • Due to relatively low banana incomes, access to food is challenging, especially for small-scale farmers and workers. • Workers in large-scale plantations normally have right to a meal during their working hours.
Social Capital	• Producers are well organised, contrary to workers. • Good access to information but limited trust among actors in the VC. • High social involvement in the VC at community level.
Living Conditions	• Producers and workers have better living conditions and more opportunities to improve their life comparing to other VCs. • The VC contributes in large part to a better access and affordability to health services.

IS THE ECONOMIC GROWTH INCLUSIVE?

The economic growth in the value chain is not entirely inclusive. Firstly, there is a concentration of the operating profit generated by the value chain in a small number of actors, as some large-scale producers are also exporters and/or ripening companies. Secondly, even though the highest part of the income is distributed to workers (35% of the direct value added) given that it is a labour-intensive production, salaries per capita remain relatively low (362 RD$ or €5.95/day, namely 7,849 RD$ or €129/month). Thirdly, small-scale producers (organic and conventional) receive only 8.6% of the net operating profit, despite being the most numerous (Figure 3).

On the other hand, the value chain has a very positive impact at community level thanks to the use of the premium coming from fair trade, that equals €17 million per year. Moreover, the value chain contributes significantly to a range of national measures, such as the development of good environmental practices or the widespread employment of labour force. Indeed, the banana value chain employs 32,000 workers (around 11% of workers in the agricultural sector) but 56% of them are part-time.

IS THE VALUE CHAIN SOCIALLY SUSTAINABLE?

The value chain is sustainable in relation to four out of the six social domains: living conditions, social capital, food and nutrition security and land and water rights (Figure 4). However, there are high risks to the social sustainability in the domain of the working conditions because of informal migrant workers, lack of collective negotiation, and, to an extent, discrimination of women and migrants. The low representativity, the low trust among actors in the value chain, the difficulties for workers and the vulnerability to climate change make other non-agricultural value chains more attractive, especially for young people.

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Environmental analysis

Four production systems were considered in the analysis: small-scale organic (type A) and conventional (type B), large-scale conventional (type C) and organic (type D). **Three main steps of the banana life cycle** were assessed: cultivation, processing (fruit cleaning and packaging) and transport until the port for export (terrestrial and sea freight).

At farm level, the impact varies depending on the production system, particularly if organic or conventional. For organic farms (type A and D), fertilisation is the main source of impact, due to the use of phosphorus and the emissions developed by the use of the organic compost (NH3, N20, NOx). For conventional farms (type B and C), mineral fertilisation and the use of chemical fungicides, to deal with the Sigatoka disease, are the main contributors, particularly for the categories referring to toxicity.

At country level (craddle–to-country-gate), irrigation represents around 60% of the damage on ecosystems and human health and 25% of the damage on depletion of natural resources (Figure 5). There is a significant difference depending on the irrigation system by flooding or spraying. Transport to the port and packaging, especially wrapping, contribute on average between 35% and 26% to damages on natural resources, while fertilisation contributes for around 10%.

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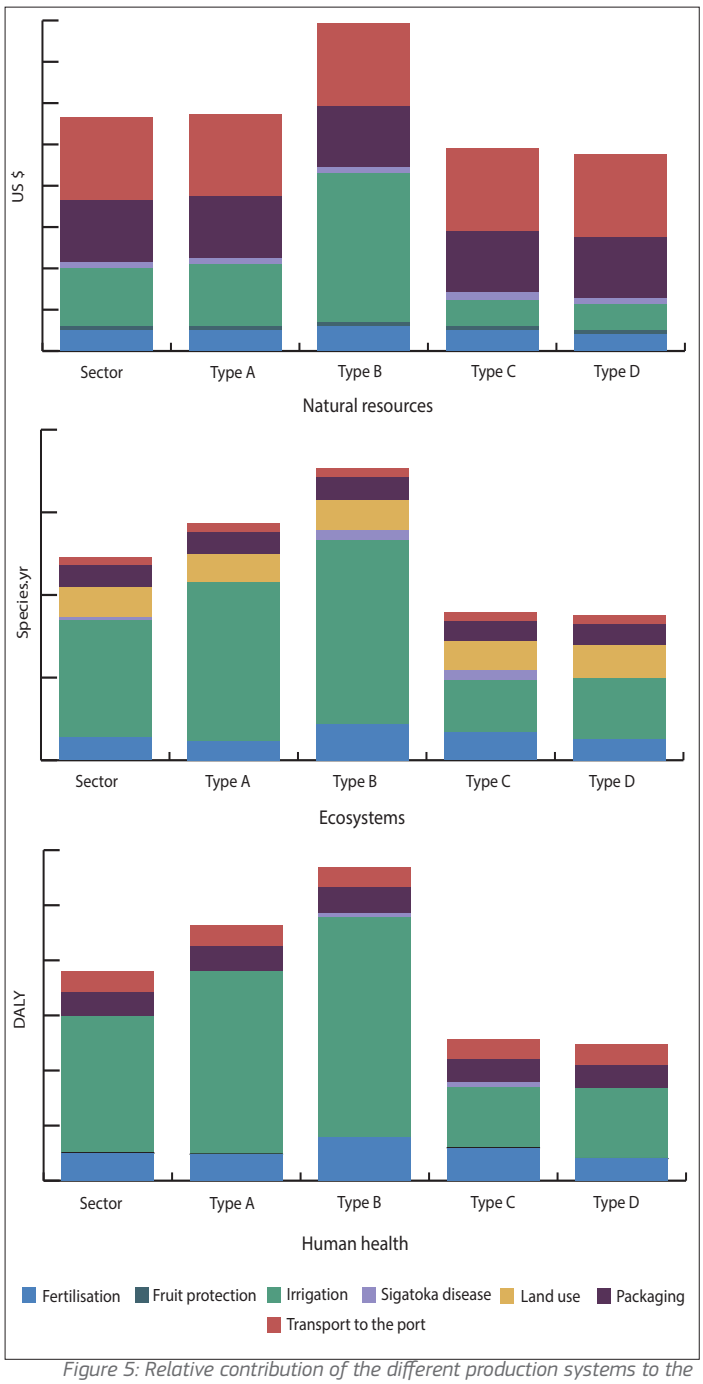

Figure 5: Relative contribution of the different production systems to the damage on natural resources, ecosystems, and human health for 1 kg of banana "craddle-to country gate"

IS THE VALUE CHAIN ENVIRONMENTALLY SUSTAINABLE?

The Dominican Republic benefits from natural conditions advantageous for banana production in general, and for organic in particular (low level of vulnerability to diseases, quality of the soil). Up to now, the conventional production system does not use inputs intensively, inducing a better environmental footprint for the Dominican banana compared to other origins. However, the value chain is not environmentally sustainable given the problem of water resources management and the impact of irrigation on fertility and soil quality. This is challenging in particular for small-scale producers, while large-scale organic producers could invest in modernised and more efficient irrigation systems. Considering the increasing vulnerability of producers due to climate change, this situation is serious even though producers have proved able to adapt with investment and capacity strengthening.

Conclusions

SWOT analysis of the banana VC in the Dominican Republic

	POSITIVE	NEGATIVE
INTERNAL	**STRENGHTS** • Network of small-scale producers. • Natural favourable conditions with limited exposure to diseases. • Experience in organic production. • Privileged relation with European clients. • Geographic proximity to export markets compared to regional competitors.	**WEAKNESSES** • Low technical and education level of producers (bad cultivation practices). • High rotation of the labour force, not qualified, low level of labour productivity. • Lack of workers' availability and low attractiveness of agriculture • High costs of production (import of inputs and fuel). • Low land productivity and low level of yields. • Difficult access to finance for small-scale producers. • Mistrust in regard to compliance with the criteria of organic production which impacts negatively associations (loss of certification) and creates unfair internal competition. • Weakness of the cold-chain and lack of storage facilities in the port.
EXTERNAL	**OPPORTUNITIES** • Good reputation of the country for banana. • Growing market (+12%/year). • Niche market for new certification (Demeter). • New innovative practices helping to increase yields, protect the soil and deal efficiently with the Sigatoka disease.	**CHALLENGES** • High competition with new exporters to the EU market (Peru, Ecuador, Colombia). • Decreasing prices with the liberalisation of the EU market, low capacity for producers to negotiate prices compared to distributors. • Vulnerability to climate change, droughts and floods, availability of natural resources. • Exclusion of producers due to the low capacity to comply with quality and more demanding requirements. • Dependency on truck companies' unions for transport to the port, blocks and high costs. • Dependency on shipping companies and their decisions for logistics.

Recommendations

The VC contributes significantly both to the national and local levels, not only in terms of production, but mainly also for the associated impacts: fair trade system and social development in rural areas, boosting of organic production, development of the social capital via the associations, etc. Moreover, the VC shows resilience that contributes to the VC sustainability and creates opportunities. To conclude, the following recommendations are suggested:

- **Maintain and reinforce the efforts in terms of capacity strengthening for producers and workers**, especially regarding productivity and the promotion of good agricultural practices;
- **Develop an operational governance in the VC** that could facilitate the management of quality issues and of commercial negotiations ;
- **Adopt good practices** for both agro-ecological innovations (soil topping, plant material, warning systems for the Sigatoka disease, crop diversification) and investments for more efficient equipment (spraying irrigation systems or aerial cabling);
- **Create a compensation fund in case of climate events**, in order to help producers to recover more rapidly and avoid falling into poverty spiral.

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 "Value chain analysis of Banana in the Dominican Republic" by Pauline Feschet (CIRAD), Ingrid Fromm (Bern University of Applied Sciences), Fedes van Rijn (WUR) y Benito Cruz (independent expert). Only the original report binds the authors.