European Commission

VCA4D
VALUE CHAIN ANALYSIS FOR DEVELOPMENT

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Analysis of the banana value chain in Burundi

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-/documents/methodological-brief-eng). 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

Banana plantations are on the rise in Burundi simultaneously with an increase in land scarcity and a decrease of livestock ownership.

Bananas are the dominant crop in farming systems across all areas of the country except in the highlands of Mugamba where soil is more acidic and the weather too cold. The surface occupied by bananas is estimated between 200,000 and 300,000 ha, representing 20 to 30% of the agricultural land of the entire country. Banana cultivation guarantees a source of economic stability for households, contributing to the local development.

Banana is the most commercialised food crop throughout the country's markets, from local, national up to the regional level.

The European Union intervention

The European Union Delegation (EUD) to Burundi supports production activities that reinforce the country's food security. The EU promotes the economic development of the private sector, notably by encouraging the transformation of agricultural products as well as regional trade. Several food value chains (VCs) in Burundi have been studied thanks to the support of the EU, the Belgian Cooperation and IFAD: in particular rice, milk, maize, cassava and banana.

The VCA4D study comes in support of the activities of the EUD and its partners for the sustainable and inclusive development of the banana VC. This study builds on previous analyses, such as the one on the banana market and the feasibility study on its transformation in juice, beer or wine to increase the value of the product, performed by the Confédération des Associations des Producteurs Agricoles pour le Développement (CAPAD) and the Collectif Stratégies Alimentaires (CSA).

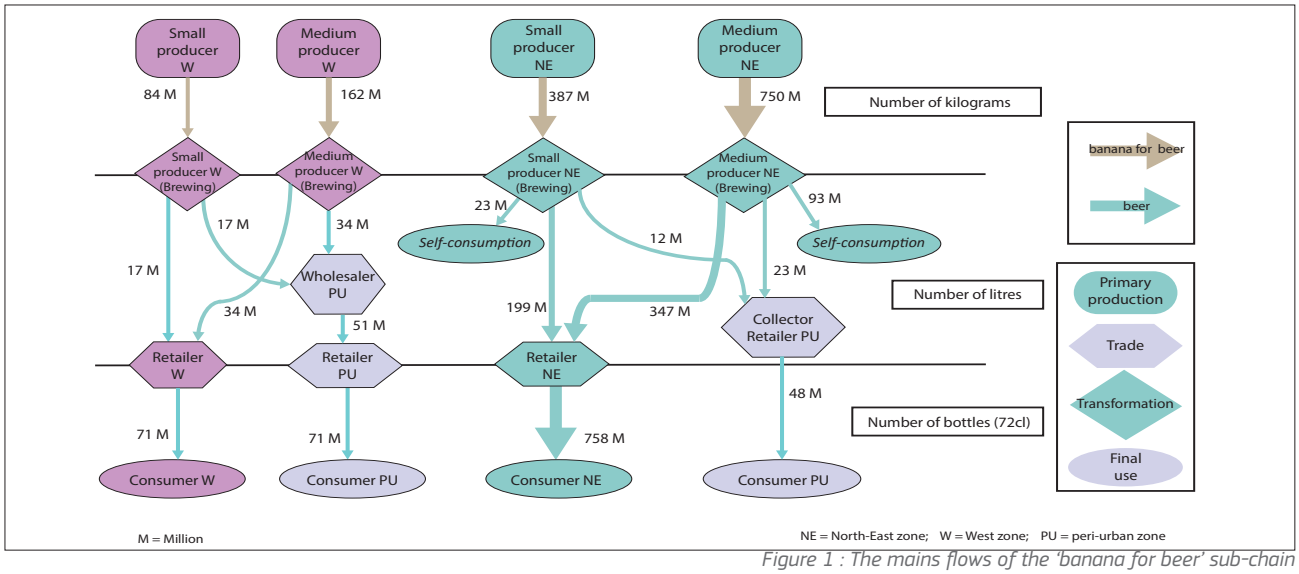

Figure 1 : The mains flows of the 'banana for beer' sub-chain

Functional analysis

Geography of the production

National banana production has been estimated at around **1,800,000 t for the 2017-2018** agricultural season (Table 1) and it involves more than **1.3 million agricultural households**.

The North-East (40-50% of the national production), the peri-urban area of Bujumbura (20-25%) and the West of the country (provinces of Cibitoké, Bubanza et Kayanza) (15%) represent the bulk of the national production.

Production systems

Except for some larger plantations, most banana producers have small polyculture plantations. Two main banana production systems exist: an **integrated and circular model** developed by small-scale producers on the small plots (generally less than 15 square meters) surrounding the Urugo (housing hut) and a **more intensive model** developed by medium-scale producers (counting on several ha) in areas of higher production potential. Yields range from 5 to 60 t per ha.

Banana growing around the Urugo is a specificity of Burundi. When building the Urugo, each Burundian household establishes a small banana plantation in the vicinity. This crop benefits from the continuous supply of organic material deriving from household waste and therefore needs few inputs. Yields can be quite low when the crop is left pushing spontaneously or, on the contrary, higher if cared for as a 'garden'. Biomass derived from the banana tree increases soil fertility and productivity. This system favours more intensive production and crop rotation with taro, beans, maize, aubergines, sweet potato, etc. Bananas are self-consumed at household level or sold in local markets.

Banana sub-chains

Banana cultivation can be grouped in three different categories: i) **banana for beer/wine** (around 77% of the national production in volume) which juice is extracted and fermented (Figure 1); ii) **bananas for cooking** (14%); (iii) **dessert banana** (5%) which are ripened and directly consumed.

Varieties used in the country are generally the traditional ones, but some hybrids also exist such as the FHIA (less than 5% of the national production), grown since 2005 with the intention of intensifying production.

Processing and commercialisation

The majority of banana production is transformed for beer and wine. The artisanal processing in rural areas, mainly handled by producers, prevails over the semi-industrial processing which consists of only two units. However, a **potential for diversification and distribution of new products** (sparkling juices, banana crisps, banana flour, etc.) exists in the country.

The systems of marketing and distribution of bananas for cooking and for beer are mostly traditional and divided in two types of circuits: rural-rural and rural-urban. The supply of dessert bananas to urban areas does not pass through the same circuits and actors.

Main constraints

At the production level, bananas trees remain vulnerable to several diseases. One of them is the **fusarium** that has existed in Burundi for more than 30 years and affects almost all production areas. Producers also suffer from the **aging of banana plantations** (some of them having more than 50 years) which leads to a yield decrease. The spread of new varieties such as the FHIA is an improvement but this is not enough to efficiently and sustainably address the diseases.

At the processing and marketing levels, the main constraints are the **price of imported packaging for small processors and the access to external markets for several actors**.

Governance

The VC does not have a national structure dedicated to its sole governance. Support services, such as producers' extension services, as well as market organisation are still weak. The VC coordination, both vertically and horizontally, is quite limited despite signs of improvement.

Area/ Category (sub-chains)	Banana for beer (traditional varieties)	%	Banana for cooking (traditional varieties)	%	Dessert banana (traditional varieties)	%	FHIA (cooking, dessert)	%	Total
North-East	1 135 517	82.2	209 425	86.2			90 000	100	1 434 942
West	246 015	17.8	28 434	11.7					274 449
Peri-urban			5 128	2.1	85 481	100			90 609
Total	1 381 532	100	242 987	100	85 481	100	90 000	100	1 800 000

Table 1: Distribution of the national production of bananas (in t)

Economic analysis

Profitability of activities

The activity is profitable for the majority of downstream actors in the sub-chains of banana for beer (collector-retailer, wholesaler and retailer), banana for cooking (collector), dessert banana (collector-ripener and retailer) and the FHIA variety (wholesalers).

A producer's annual net income is below the national poverty line (around €247/year in 2014), except for a producer of dessert banana (€288) and a medium-scale producer of the FHIA variety (close to €1,000). A producer of banana for cooking usually earns a particularly low income, but often produces also a significant quantity of banana for beer, thus increasing the overall net income from banana production. Moreover, banana cultivation is always associated with other agricultural productions and/or extra-agricultural activities.

Contribution to economic growth

The **direct value added** (VA) of the VC was estimated at **€362 million** in 2017-18. It is mainly due to the banana for beer (Figure 2). The indirect VA is minimal, given the low use of intermediate consumptions provided by actors operating outside of the VC: the VC thus generates a low backward effect in the national economy. The **rate of integration into the national economy** is of 95%, because the low-intensive production and artisanal processing do not heavily rely on imported consumables.

The VC contributes extensively to the economic growth in Burundi, representing 14% of the GDP of the country, 38% of the agricultural GDP and 45% of the value added of food crops (in 2014). The VC, however, contributes by only 3% to public finances. Despite this, it remains indispensable for the **decentralised taxation** because taxes collected all along the banana VC represent around 70% of the municipalities' fiscal receipts.

Despite the low imports of inputs, the banana VC does not significantly contribute to reduce the structural trade deficit of the country. Indeed, its contribution to the balance of trade is negligible, considering the low volume of bananas exported (mainly to Tanzania).

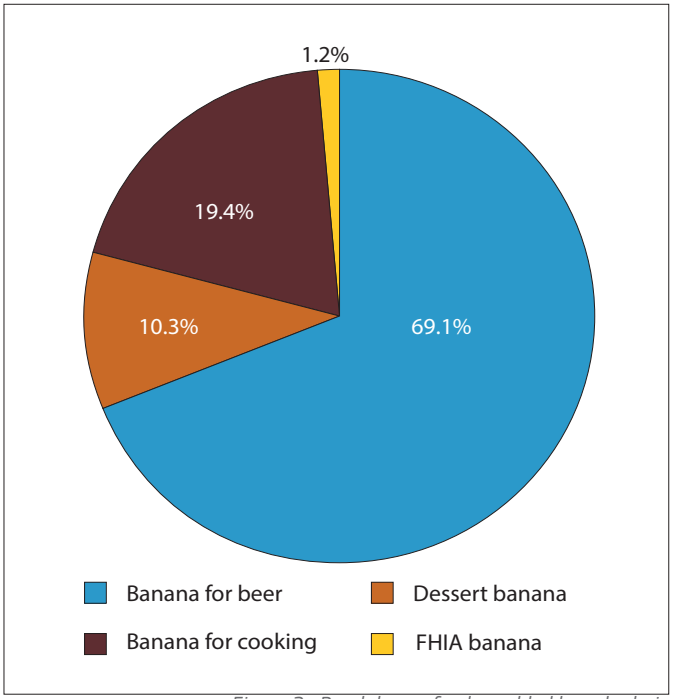

Figure 2 : Breakdown of value added by sub-chain

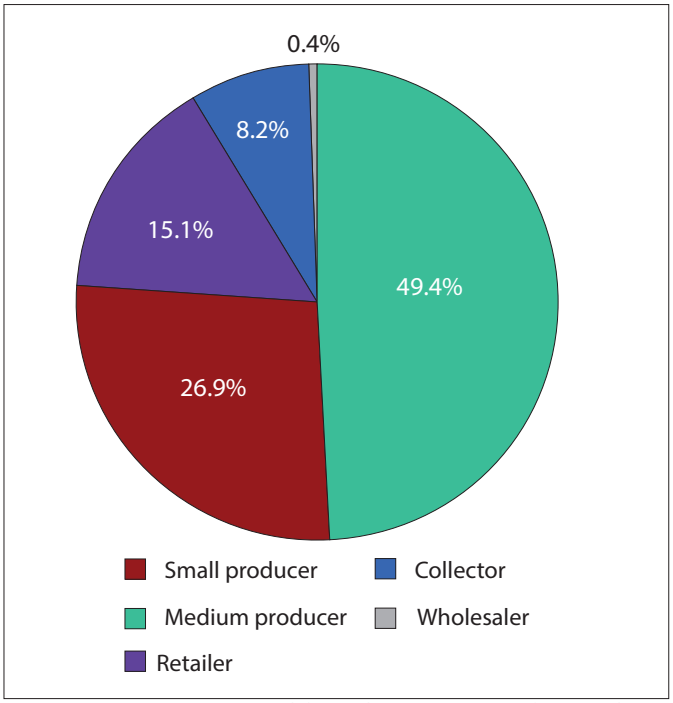

Figure 3 : Breakdown of operating income by type of actor

NB: semi-industrial processing is excluded from this graph

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

With a contribution of 14% to the GDP and of 38% to the agricultural GDP, banana is a pivotal activity in the Burundian economy. Nevertheless, its value added is distributed among a large number of actors and the annual average income per producer is generally below the national poverty line. However, banana plantations, especially when done via the 'garden system', allow for mixed/inter cropping, thus contributing to food security and income creation. The value chain contributes minimally to the national budget, but it remains essential for municipalities' taxation. Finally, the VC provides very little foreign currency.

Social analysis

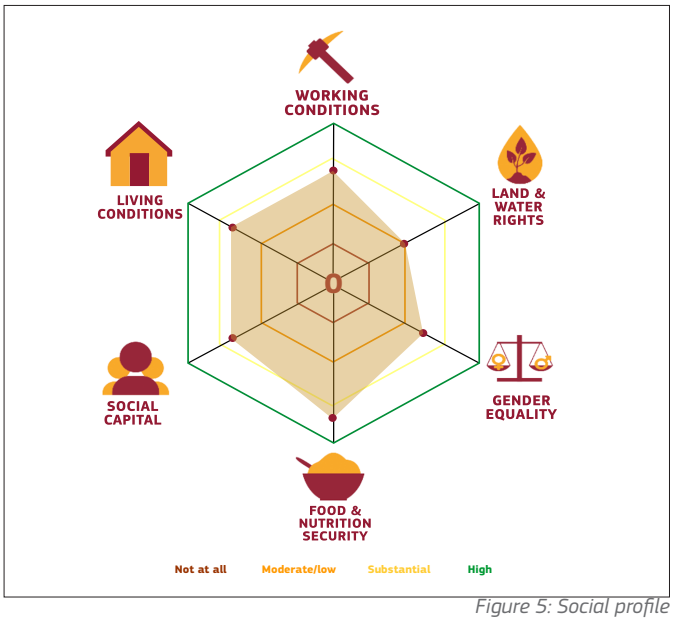

Figure 5: Social profile

Working Conditions	• Compliance with international laws is not effective particularly as regards to some aspects (child labour, women representation, etc.) • A significant advance in terms of working conditions is noticeable in semi-industrial factories of banana beer and wine: workers with a regular contract account with some social benefits.
Land and Water rights	• Municipalities suffer from the lack of financial means to set-up communal land services. Arbitration procedures are often time consuming to establish. • Women are not automatically entitled to family land as men are. Their rights to access, use and own land depend on their fathers or brothers.
Gender equality	• In the sector of semi-industrial processing of banana beer and wine, approximately 60% of fixed contract holders are women. • Agricultural activities are increasingly undertaken by women, as banana is no longer considered as an exclusive domain of the head of the household, both in terms of maintenance and marketing.
Food and Nutrition Security	• Bananas can be found all year round and across the entire country, guarantying regular income for rural households. In periods of food scarcity, banana for beer can also be used as banana for cooking. • Banana cultivation has a positive effect on food and nutrition security, although the overall situation of the country has yet to significantly improve in this domain. • The artisanal preparation of banana beer/wine (from peeling to filtering) and its distribution and commercialisation present critical hygiene and sanitary risks. These risks, but also the high quantity of beer consumed, provoke serious health issues to consumers.
Social capital	• The banana VC is at the heart of social relations in rural areas. • Producers' associations are gradually being structured. They range from informal associations in the production hills, to associations and cooperatives. All these organisations are in the set-up stage and are supported by various international institutions and NGOs.
Living conditions	• In banana production areas, funding to cover school fees comes almost entirely from the income earned from banana. • All activities in the VC contribute substantially to improve the main infrastructures and social services.

IS THIS ECONOMIC GROWTH INCLUSIVE?

The VC distributes income across a large number of producers. Approximately 76% of the operating profit is at the level of producers (Figure 3). However, the individual income of producers is much lower compared to the one of the actors at downstream level. For example, within the banana for beer sub-chain, a retailer-collector, a wholesale-trader and a retailer have an annual net income respectively 36 times, 122 times and 22 times higher than the income of a small producer in the North-East.

The VC contribution to wages is quite insignificant. It amounts to around €9 million, representing less than 3% of the VC direct value added. Of this amount, 53% is distributed by producers (45% by medium producers and 8% by small producers), 39% by retailers and the rest by other actors in the VC. Wages distributed across the banana VC amount to around 23,000 full-time equivalent employments at the guaranteed minimum wage (SMIG). However, in rural areas, the SMIG is rarely applied and annual wages concretely distributed to workers are much lower.

IS THE VALUE CHAIN SOCIALLY SUSTAINABLE?

Economic growth generated by the banana value chain appears to be overall inclusive and sustainable from a social point of view. However, actors are confronted with land tenure problems and food insecurity.

Because of land tenure insecurity in Burundi, the government put in place a policy to promote the formalisation of land rights via the establishment of communal land services. Municipalities however need financial and institutional support to make these services efficient.

In addition, banana represents an important factor of monetarisation in the rural society, considering the quantity exchanged and its contribution to income. It is also a direct source of food. Banana cultivation thus plays a significant role in food security. However, most actors in banana production areas constantly face difficulties to access food and/or to have enough money for buying food before each harvest.

Environmental analysis

The analysis takes into account differences among regions as well as distribution circuits (small or medium producer; artisanal or semi-industrial processor; local, urban or national market).

Resource depletion

Agricultural production has little impact on resources because it does not make use of chemical inputs, nor agricultural equipment or irrigation. **The other stages of the VC are indeed responsible for bigger impacts.** Semi-industrial processing (fossil resources for the production and transport of bottles, energy and chemical products for the processing) and the long circuits (fuel for the distribution within the country) have more impact than the artisanal processing and the short-distance circuits (local level, nearby urban centres). As opposed to the processing being done in the urban centres, less impact was shown by the artisanal beer processing happening directly in loco before the bottling and transport to town (Figure 6).

Ecosystem quality

Given that production is conducted with little use of mineral inputs, **its impact on ecosystems is mostly influenced by the agricultural yields**. In the North East, medium producers use high-yielding varieties, therefore their impacts are lower than those of producers in the West, who have delayed adoption of these varieties. Small-scale producers of banana for beer have lower yields, therefore their impact per unit of banana produced is higher (soil use) (Figure 7). In the peri-urban areas (bananas for cooking), the performance is similar to the one of the medium producers (organic waste and care in the Urugo system). **Mixed and inter-cropping results in lower impacts than banana monoculture. Semi-industrial processing via enzymatic extraction has less impact than the artisanal method** (fewer bananas needed).

Human Health

Impact on human health is higher for medium producers because their high yields are not enough to compensate the impact of the organic fertilizers used. **Short marketing circuits reduce impacts** (reduced transport distances). **Artisanal processing of beer**, made without the use of fossil resources and of chemical substances, **has a much lower impact than the semi-industrial processing**. The consumption of electricity, production and transport of bottles and distribution across a larger network are all factors that increase the impact of semi-industrial beer despite its high juice extraction efficiency (Figure 8).

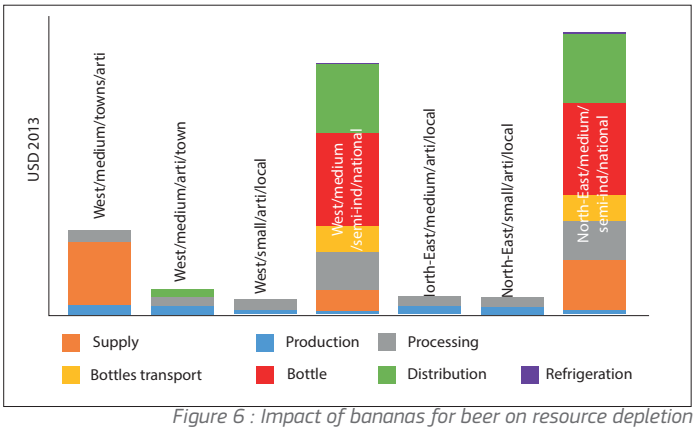

Figure 6 : Impact of bananas for beer on resource depletion

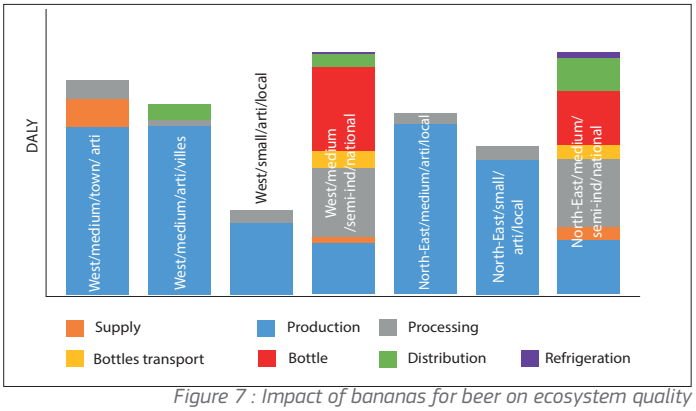

Figure 7 : Impact of bananas for beer on ecosystem quality

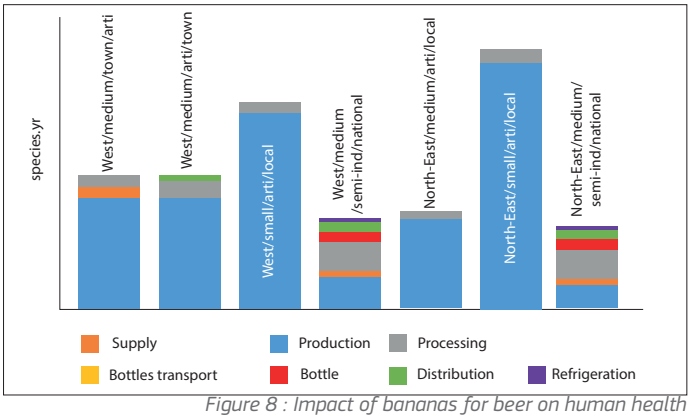

Figure 8 : Impact of bananas for beer on human health

IS THE VALUE CHAIN ENVIRONMENTALLY SUSTAINABLE?

Agricultural production has a very low impact on resources. On ecosystems, crops combination results more beneficial than monoculture of banana. Yields and agricultural practices have more impact on ecosystems than the size of the farm itself. Small-scale producers have less of an impact on human health. Semi-industrial processing of banana beer from medium producers has the highest impact on resource depletion and human health due to the use of fossil resources for the production and transport of bottles and the use of some chemical products. On the contrary, its impact on ecosystems is lower compared to the impact of artisanal processing. Short-distance marketing circuits reduce the impact of the VC on resources and human health. Overall, the impacts measured do not allow to conclude that the VC is unsustainable from the environmental point of view.

Main findings

Although the extensive production model has a negative impact on ecosystems, **banana cultivation plays a major role in maintaining the soil fertility**, especially in the garden model (Urugo), which exists in all traditional farms. In order to promote actions that can contribute to restore and preserve the soil, a better comprehension of the way the garden model functions is fundamental. An ad hoc study focused on the analysis of the garden model (activities, specificity, evolution, etc.) is suggested.

Even if revenues are overall low and below the national poverty line, the **income from banana concerns a large number of producers and must be preserved**. Banana production is important also because it allows for combining crops, especially in garden model and thus it contributes to guarantee food security and to create additional revenues. The non-preservation of these incomes would imply the risk of increasing inequalities, jeopardizing food security and increasing the costs of basic foodstuff.

Better water management is important to increase the productivity of banana plantations. This is necessary to counter erratic rainfall patterns and it allows for a better cultivation planning that integrates the market demand. Except for some rare irrigated plots, banana plantations have disappeared in arid areas under the pressure of diseases. Water management must therefore be improved.

The adoption of an overly technical model for intensifying production has its limitations. If the size of the FHIA banana bunches justifies an enthusiasm, this variety requires 9 or more months for maturation and is suitable for large-scale producers in the North who can sell their bananas to a banana chips factory in Tanzania. However, it is not appropriate for small producers who rely on regular bananas harvests to guarantee their food security. Moreover, the competitiveness of this variety is also penalised by the mediocre quality of the juice and by the poor number of bunches per stem.

Despite semi-industrial processing being limited, a range of processed artisanal products is progressively developing: sparkling juice, beer and wine. There is also a potential for bananas for cooking and FHIA bananas to be used for chips, flour, children foodstuff, etc. **This diversification needs to be well oriented and supported** via the creation of suitable circuits for distribution and this should be done in complementarity with the traditional processing of bananas. The development of semi-industrial processing should also affect the structuring of production at upstream level via the development of contract farming agriculture.

It is important also to **find alternatives to the import of PET (PolyEthylène) bottles** from Uganda in order to reduce the impact on human health as well as to improve the access to packaging material for small processors. Using reusable glass bottles could be a good option but attention shall be paid to limit water and soap use for cleaning.

The governance of the banana VC must be approached with caution to avoid the creation of structures that would result in decreasing producers' incomes rather than increasing value adding.

Trade of bananas with neighbouring countries is very limited. Nowadays, exports of FHIA bananas to processing units in Tanzania do not exceed 2000 t per year and they do not have yet a significant impact on the balance of trade of the country. The cross-border trade between Rwanda and Burundi is underdeveloped, whilst demand for bananas for cooking from Kigali is estimated at around 8,000 t, which could be partially satisfied from the close Burundian province of Kirundo. **Greater banana production in Burundi would easily find outlets on the regional markets.** More production would increase the purchasing power of several Burundian producers which cultivate in favourable areas from an agronomic point of view but are not yet very competitive (due to isolation of production areas, hassles at the frontier stations, etc.).

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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 'Banana value chain analyis in Burundi' in 2019 by Philippe Lebailly, Fayçal Boureima, Vincent Lare and Patrice Ndimanya. Only the original report binds the experts.

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