PATHWAYS TOWARDS SUSTAINABILITY:
Farmer Organisations in the driver's seat.

Development actors have often been the promoters of more sustainable practice in agriculture and chain development. However, practice of sustainable agricultural chain development shows that a variety of chain actors and chain supporters own the initiative of converting chains towards sustainability.

In some cases farmers and their organizations decide to convert their production methods to address problems that face in their production systems; erosion, plagues, soil fertility decline… In other cases they start to produce more sustainably because of a growing awareness that their resources should be managed more carefully in order to conserve them for future production. Still in other cases they want to secure their income through crop or market diversification.

The case below describes how coffee farmers in Ecuador develop markets for the plantain that grows as shade trees for coffee plants.

Case: coffee & plantain chips chain in Ecuador

1. The coffee and plantain sub-sectors in Ecuador

According to the International Coffee Organization (ICO), Ecuador was the world's 10th biggest ***coffee*** exporter in 1990. In that period, coffee was also one of the most important export products of Ecuador. Ten years later, however, export figures plummeted to less than half of their 1990 peak. Whereas other coffee producing countries like Brazil, Colombia and Costa Rica have been investing large amounts of money to upgrade and improve the cultivation and quality of coffee, Ecuador simply continued to produce coffee with the old technologies. This reduced considerably their competitive strength on the international market, as coffee plantations in Ecuador have now one of the lowest yields in the world (less than 250 kilograms peeled coffee per hectare). This collapse of the national production did not only influence the economic situation of the country, it also impoverished tens of thousands of small farmer families, which have consequently migrated to the cities in search of better fortune. (COFENAC, 2011)

The coffee sector has been selected by the Ecuadorian Government as a "strategic commodity". The Agricultural Ministry is starting a 10 year program and willing to invest 38 million US$ for reactivating the coffee sector. This program aims to increase production to 2.5 million bags anchored on the 5 leading (second grade) farmer organizations that operate on the sector (Including FAPECAFES and FECAFEM, both VECO partners).

Despite the absence of structural investments in the production of coffee, Ecuador has invested a lot in the coffee processing industry, which now boosts the most modern installations to process coffee into instant coffee. As a result, Ecuador started importing a lot of coffee for the processing industry to have sufficient supply. In response to this problematic situation, a coffee law

was approved in 1995 to give a new stimulus to the coffee production. This impetus contributed to the rise of the National Coffee Counsel COFENAC. A special tax of 2% is levied on the total export of coffee beans to finance the Counsel's work and representatives of the different sectors (export, processing industry, producers and government) sit on its board. COFENAC is responsible for managing the reactivation fund. The 1995 law stipulates that 80% of this fund should go towards credit programs for the renovation of the old plantations, however omitting the education, technological improvements and the organization of the farmers out of the fund's scope. During the first 5 years since COFENAC's establishment, results were not that good. The crisis in the coffee sector was worse than ever. In 2000, Ecuador saw its coffee imports soar to over 12 million kilograms, mainly originating from Africa and Asia. (COFENAC, 2011)

In 1998, Amazonian coffee farmers created CORECAF, which became the most representative syndicate of the coffee sector. The organization's activity portfolio consisted of: technical assistance, education, research, support to commercialization associations, rural microcredit services and the defence of the interests of the coffee farmers.
CORECAF is actually not functioning as it should after a couple of years of institutional crisis: the organisation lacks legitimacy and a political base to represent the interest of coffee growers. At the moment, there are many political discussions about whether or not to reactivate the CORECAF or to create a smaller, "brand new" political organisation to represent coffee farmers.

Plantains, or cooking bananas, are the economically smaller sibling of Ecuador's main export product: sweet bananas. Both fruits have been traditional staples in the country, and for over a century Ecuador has already been exporting them abroad, up to the point that Ecuador is now the world's biggest exporter of bananas and the third biggest of plantain.
Plantains constitute an essential element of Ecuador's diet: 85% of all Ecuadorians eat plantain or its derivatives. It is a staple food with high nutritional value, rich in vitamin C, phosphor and potassium. The FAO even considers it the fourth most important crop in the world because of its high calory intake (after rice, wheat and corn). (FAOSTAT, 2011)
Plantain makes for an interesting crop to grow, not only because of the green fruit itself, but also to process it further into a whole plethora of other products. The best internationally known derivative of plantain are chips (*chifles*); but there are also *bolones* (fried plantain balls), *patacones* (similar but larger than the chips, are local names; can also be deep-frozen), flour (for both human and animal use) and *hojuelas* (pancakes, can also be fried). In addition to these products derived directly from the plantain fruit, one can also use the stem, the leaves, the flowers and the roots of the plantain tree to make flour, vinegar, paper, pies, processed wood and forage for animals.

Currently, the plantain sector employs approximately 142,500 people on a yearly basis, supplying both the domestic and international markets with 550,000 tons of plantain in 2009, as is shown in tables 1 and 2. Although the demand for plantain and its derivatives comes mainly from the internal market, international markets have started appreciating this tropical crop and demand is expected to grow over the coming years. The majority of plantations (50,000 approximately) are focused on the cultivation of plantain alone, whereas some 30,000 plantations grow other crops alongside the plantain. (FAOSTAT, 2011)

Ecuador	Production 1990 (tons)	World share (%)	Production 2000 (tons)	World share (%)	Production 2009 (tons)	World share (%)
Plantain	1,065,220	4.02	475,724	1.56	549,388	1.53
Banana	3,054,570	6.53	6,477,040	9.95	7,637,320	7.84
	Export 1990 (tons)	**World share (%)**	**Export 2000 (tons)**	**World share (%)**	**Export 2008 (tons)**	**World share (%)**
Plantain	53,014	34.23	101,223	19.88	86,395	17.98
Banana	2,156,620	23.88	3,993,970	27.86	5,270,690	29.31

Table 1: Ecuador's banana and plantain production and exports (FAOSTAT)

Country	Production 1990 (tons)	World share (%)	Production 2000 (tons)	World share (%)	Production 2009 (tons)	World share (%)
Uganda	7,842,000	29.63	9,428,000	30.83	9,512,000	26.41
Colombia	2,515,900	9.50	2,825,080	9.24	3,011,780	8.36
Ghana	799,000	3.02	1,932,500	6.32	3,562,500	9.89
Nigeria	1,215,000	4.59	1,969,000	6.44	2,910,680	8.08
Rwanda	2,776,770	10.49	2,212,250	7.23	2,981,800	8.28
Ecuador (#14)	***1,065,220***	***4.02***	***475,724***	***1.56***	***549,388***	***1.53***
World	26,470,614		30,582,158		36,012,047	

Table 2: Top producers of plantain (FAOSTAT)

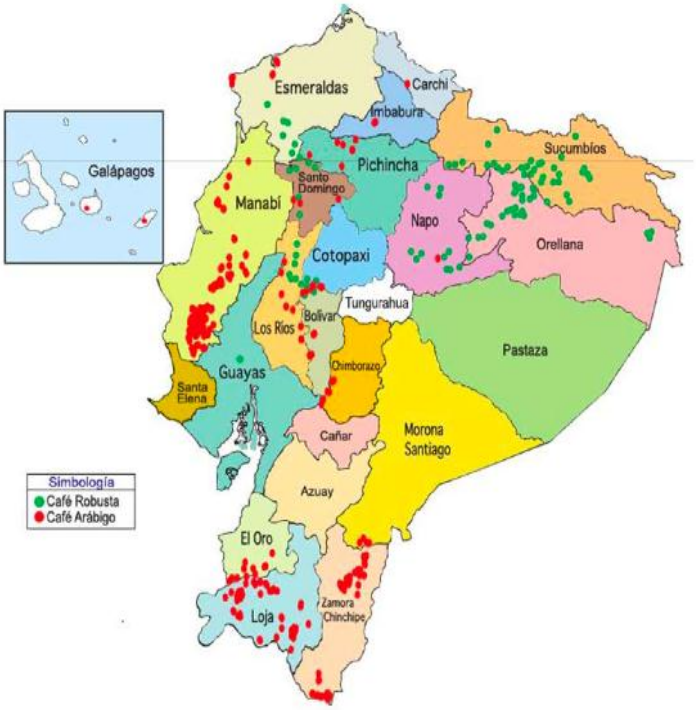
Country	Export 1990	World share (%)	Export 2000	World share (%)	Export 2008	World share (%)
Guatemala	6,558	4.23	55,650	10.93	115,870	24.11
Colombia	-	-	146,548	28.78	101,775	21.18
Ecuador	***53,014***	***34.23***	***101,223***	***19.88***	***86,395***	***17.98***
Peru	228	0.15	856	0.17	78,166	16.26
Netherlands	-	-	11,379	2.23	29,689	6.18
World	154,881		509,145		480,595	

Table 3: Top exporters of plantain (FAOSTAT)

The main cultivation areas of plantain are El Carmen (Manabí), Esmeraldas, Los Ríos, Pichincha and the Ecuadorian Amazon region, all tropical and sub-tropical climate zones. As cultivation areas are expanding, both labour and environmental concerns have been raised.
A particular concern is the increasing use of chemical products during the production process and after the harvest, as well as the vast quantity of waste that comes along with it. Small scale organic alternatives constitute a valuable alternative to the chemicals, although they are still in an incipient stage of development. The cultivation of plantain is a very inclusive agricultural activity, with women participating in all activities ranging from the planting and harvesting to the processing and even marketing of plantains. Women do not, however, receive a fair remuneration for their work, especially when compared to men's salaries. (López and Choez, 2009)

Within the plantains sector, both national and regional organisations exist that represent plantain producers. Examples of these are, respectively, FENAPROPE and FAPECAFES, which seek to influence policies to improve the development of plantain chains for small scale farmers. However, limited organisational capacities and issues with representation impede major changes in

the field. In response to this situation, more local initiatives have surged, as can be observed in Ecuador's Amazon region, to promote the plantain. But, they remain somewhat isolated initiatives (so far only in the provinces of Zamora Chinchipe, Santo Domingo and Los Ríos), a first step towards bringing all plantain organisations in Ecuador together. (López and Choez, 2009)



2. Coffee/Plantain intercropping and cultivation

Intercropping coffee in the shadow of banana or plantain plants is a common agricultural technique, mainly used by small scale farmers, to make optimal use of limited land. Moreover, it gives farmers the benefit of spreading their risks, both in terms of price shocks on the international market and failed harvests of one crop. It is technique that farmers have used all over the world, especially in Central and South America and Central and East Africa. The coffee harvest is usually in June and July, when the cool mornings assist the maturing process on the plants, and bananas are harvested throughout the year. (van Asten, 2011)

2.1. Coffee cultivation

The predominant species of coffee grown in Ecuador are the *Coffea arabica* and the *Coffea robusta*. The spreading of these species are shown in the map on the right. Most coffee plantations cultivate the *C.arabica*, as this coffee species adapts more easily to the different types of ecosystems that can be found in the country. It can be grown at an altitude of up to 2,000 meters, in the coastal, mountain and Amazonian areas and the Galápagos Islands. The *C.robusta* species, on the other hand, only thrives in tropical and humid areas to be found in Ecuador's coastal and Amazonian regions, up to an altitude of 600 meters. Coffee can be cultivated on plantations that uniquely grow coffee (mono-cropping) or together with other crops (intercropping). Although the latter option reduces the yield per ha, it has several benefits, such as preserving greater biodiversity and, in case of higher crops such as banana plants, offering the coffee trees shade. Shade-grown coffee is considered to be a more sustainable form of growing coffee, as it reduces the need for chemical fertilisers, insecticides, herbicides, fungicides and other pesticides, otherwise used to stimulate the growth of sun-grown coffee trees.(CoffeeResearch, 2011)

Coffee seedlings are grown in nursery beds that contain soil consisting of well-rotted cattle manure and phosphate fertiliser. They are shaded 50% for the first couple of months, before being planted in the coffee fields. It takes about three to four years for coffee trees to start producing coffee beans; trees then usually produce coffee beans for several decades The *C.arabica* species ripens in 6 to 8 months, whereas the *C.robusta* takes about 9 to 11 months to be ripe for harvesting. This gives coffee farmers in some areas up to 2 harvests per year. In Ecuador, however,

there is only one harvest (spread over 1 or 2 months, depending on the ripening process) on average (especially for *C.arabica*).
The harvesting itself is usually done manually, a labour-intensive and difficult process. The ripe fruits are red, oval coffee cherries and usually contain 2 flat seeds, the coffee beans. After harvest, they are combined and transported to the processing plant. The different stages of the process after harvest are: wet processing for washed coffee, drying, dry processing and distribution. (CoffeeResearch, 2011)

2.2. Plantain cultivation

There are two species of bananas, only based on their method of consumption: the (sweet) banana (*Musa sapientum)* and the plantain (or cooking banana; *Musa paradisiaca).* As previously noted, the sweet banana is the economical heavy weight in Ecuador, whereas the plantain only constitutes a small part of this cultivation business. Three plantain varieties can be found in Ecuador: Barraganete Enano (mainly for export), Barraganete Común and Dominico Hartón (mainly for domestic consumption). (López and Choez, 2009) The difference between bananas and plantains is in the final destination of the fruit and some morphological characteristics. The term banana is usually applied for the cultivars whose fruit is eaten fresh, and plantains for those being cooked. Bananas come from the genome of *acuminata* and the plantains from the *balbisiana* genre.

No distinction is made between the banana and the plantain plants in terms of cultivation. Plantains are not grown from seed, they must be propagated from large rootstocks or rhizomes that are carefully transplanted in a suitable climate. The plants grow new shoots, often called suckers, from the shallow rootstocks or rhizomes, and continue to produce new plants for several decades. The plants take about 4 months to reach their mature height (15 to 30 feet). After that, the fruit ripens in about 3 months from the time of flowering and should be harvested before its colour turns yellow. The fruit is harvested manually with a machete by a 2-men team and harvesting can take place all year round. Also, the plants can be cultivated either via a system of mono-cropping or intercropping. (Nelson *et.al.*, 2006)

Bananas begin the ripening process as soon as they are harvested. After the bananas have been harvested, the giant stems are cut down to provide rich humus for the next crop that has already begun to sprout new shoots.

2.3. Intercropping coffee and banana/plantain

Despite widespread practice by farmers across Latin America and Central and East Africa, very little research has been conducted towards the effect of intercropping coffee with banana/plantain (hereafter solely referred to as banana, given their similar cultivation process). The main work in this respect comes from the International Institute of Tropical Agriculture in Uganda. As the researchers themselves acknowledge, a lot more research still needs to be done to corroborate their findings and to allow for cross-regional comparisons. Their first findings, however, are very encouraging towards intercropping coffee with banana and pose at the very least a valid counter-balance for official policies that prescribe mono-cropping coffee to farmers. (van Asten, 2011)

In the Ugandan research study, yields for both *C. arabica* and *C. robusta* coffee (intercropping) did not differ significantly from the mono-cropped samples. Banana yields, on the other hand, were significantly higher in *C. arabica* growing regions, whereas they were lower in the *C. robusta* growing regions. The Land Equivalent Ratio[1] (LER) for intercropping coffee and banana was 2.3 and 1.5 in Arabica and Robusta growing regions, respectively. (van Asten, 2011)

Intercropping seemed to increase and decrease banana yields in *C.arabica* and *C. robusta* growing regions, respectively. Still, intercropping was beneficial as the effect on coffee yield was minimal and the LER was greater than one in both regions. Intercropping seemed to have little effect on coffee yield, possibly because competition between coffee and banana for light, soil nutrients and water between coffee and banana in the current intercrop practices may have been low. In addition, coffee may have benefited from the shade provided by banana in the intercrop. It is unlikely that pest and disease pressure created significant yield differences between mono-crops and intercrops, for both coffee and banana, as they did not differ significantly between cropping systems and in general appeared to have a minimal effect on yield. (van Asten, 2011)

The high marginal rates of return (MRR) of intercropping bananas in coffee plots (MRR = 911% for *C. arabica*, and MRR = 200% for *C. robusta*) suggest that intercropping is more profitable than mono-cropping. Sensitivity analysis performed to evaluate changes in coffee prices and wage rates affected benefits of adding banana to mono-cropped coffee suggested that fluctuations in coffee prices had little effect on benefits of intercropping in both regions but that increase in wage rates by 100% can make intercropping unacceptable (i.e. MRR < 1) in *C. robusta* growing regions due to the higher labor demand of intercropped coffee compared to mono-cropped coffee. (van Asten, 2011)

The Ugandan research study shows that intercropping coffee and banana appears to be more profitable than coffee mono-cropping. There is no particular evidence to suggest that coffee–banana intercropping is unprofitable or would lead to significant yield declines of either crop in the short term. Intercropping improves the productivity and returns of the farming system.
The benefits of intercropping can probably be further increased by improved soil management practices (e.g. use of mulch, manure and fertilizer), optimal plant densities and planting arrangements, and appropriate agronomic management practices (e.g. pruning, de-trashing).

Since smallholders in sub-Saharan Africa are often resource-constrained (i.e. land, labour, nutrient inputs) the intercropping systems like coffee–banana may provide an opportunity to optimise resource-use efficiency, allow farmers to spread risks, and strike a balance between food and cash generation.
Similar findings have been found in studies conducted in Nigeria[2], Ghana[3], Nicaragua[4] and East Africa[5]: intercropping coffee and banana presents farmers with several advantages, including

[1] The Land Equivalent Ratio (LER) is a measure to express the amount of land required to generate the same yield of both crops when mono-cropped, as the yield of both crops on one ha of intercropped land. LER > 1 signifies higher total yields from intercropping while LER < 1 signifies higher yields from mono-cropping.
[2] A.O. Famaye (2003) 'Evaluation of physiological changes in coffee seedlings intercropped with maize, cassava and plantain in Nigeria', in *Moor Journal of Agricultural research* 42 (2), pp. 218-224.
[3] K. Opoku-Ameyaw, F.K. Oppong, K. Ofori-Frimpong, F.M. Amoah, K. Osei-Bonsu (2003) 'Intercropping robusta coffee with some edible crops in Ghana: Agronomic performance and economic return', in *Ghana Journal of Agricultural Science* 36, pp. 13-21.
[4] C.M. Bacon, V.E. Méndez, S.R. Gliessman (2008) *Confronting the coffee crisis: fair trade, sustainable livelihoods and ecosystems in Mexico and Central America*, MIT Press.

risk minimisation, effective use of available resources, efficient use of labour, increased crop productivity, erosion control, food security and pest control. Also, one should not forget to include the economic value of the domestic use small scale farmers make of banana plants (e.g. alimentation, fodder), which sometimes can be greater than the external economic benefits.

3. The plantain chain in Zamora Chinchipe

3.1. Location

Ecuador has a population of 15,007,343 and consists of 4 regions (the coast, the highlands, the Amazon and the Galápagos islands) that are divided into 24 provinces, of which Zamora Chinchipe is one. Each province is furthermore divided into cantons. The plantain chain of coffee farmers supported by VECO is situated in the province of Zamora Chinchipe, located in the Amazon region. It has a population of 91,219 and a surface of 10,556 km^2. (Censo, 2010)

Furthermore, the province has a very favourable climate for the cultivation of plantain. However, excessive humidity may stimulate some of the plant diseases that affect the cultivation of plantain and, thus, reduce productivity. Together with deforestation, the many steep gradients (up to over 60%) in the province induce soil degradation, leading to acidity and increased loss in fertility. Not only is the area rich in biodiversity, there are a lot of minerals in its soil, too. Although the national government includes promoting mining investment and extraction as part of its stimulus plan for the province's economy, the provincial government has vowed to prevent any mining activities from taking place. It remains to be seen, thus, to which extent this could affect the farmers' soils and production. (López and Choez, 2009)

3.2. Chain related Data

Plantain production: 2,962 to 3,360 tons of plantains per year, of which 1,163 tons by APEOSAE, APECAP and ACRIM. To produce 1 ton of chips, 4 tons of plantains are required.
Plantain demand: 2,240 tons of plantains per year, of which Ethiquable demands 5%, local markets some 23%, regional markets 38%, domestic consumption 4% and animal consumption 6%. There is no demand for the remaining 24% at this moment in time.
Production cost: USD 0.13 per kilogram (national average USD 0.10 per kilogram). (López and Choez, 2009)
Average farm size: 28% of banana producers have up to 1 ha of crops, 18% of producers have between 1 to 3 hectares of banana crops (Flores, 2011).

3.3. Chain actors

3.3.1. Producers

- **Description of the producers**

The members of FAPECAFES are identified as small organised farmers of Zamora Chinchipe, which produce mostly coffee and plantain. A study of VECO Andino showed that 52% of the

[5] G. Ouma (2009) 'Intercropping and its application to banana production in East Africa: A review', in *Journal of Plan Breeding and Crop Science* 1 (2), pp. 13-15.

farmers' income comes from coffee sales and 22% from the selling of plantains (by farmers themselves) and chips (through FAPECAFES). These producers have several crops. Most farmers have coffee and banana plantations, but also cocoa, corn, cassava, peanuts, sugar cane and pasture. The cultivation of bananas is associated with coffee, and in some cases with cocoa.

The livelihood analysis of VECO furthermore showed that the access to food is not that difficult in this region. Most of the farmers have a guaranteed access to basic products. Also, 36% of the farmers have their own farm. Access to credit, on the contrary, is limited to only 26% of the farmers of FAPECAFES. This is an important problem because this credit is needed in emergency situations concerning health and food. When it comes to social security, as much as 56% of the farmers are enlisted in some social agricultural security. On the level of medical aid, 66% of the investigated farmers affirms to have received treatments for medical problems. 4.2% of all the infant deaths in the Zamora Chinchipe province are caused by nutritional deficiencies and nutritional anaemia, but none of the investigated farmers reported any case of malnutrition. (VECO, 2011)

Concerning the educational level, respectively 70 and 60% of the male and female farmers went to primary school, whereas none of the female respondents finished secondary school. Problems concerning racism or religious intolerance are not significant within FAPECAFES.
Zamora has been mainly colonized by inhabitants of the highlands (provinces Loja and Azuaya) thus carrying their customs (including coffee production) to the new region. They are the first generation of the colonizers' families, and are a relatively young population,
The level of migration out of the Zamora Chinchipe region is not high, although 12% of the investigated farmers indicated that they would migrate if they had the opportunity. (VECO, 2011)

Throughout the production process, both men and women participate in the cultivation of plantains. Whereas decisions are generally made on an equal basis, a somewhat greater participation of men in the actual crop management has been observed, as opposed to the greater involvement of women in the administrative tasks. Another important problem is the low level of participation of the youth in production activities. Only 53% of the eldest sons of the farmer families participated. (VECO, 2011)

- **Organisations of the producers**

The organised family farmers of Zamora Chinchipe that produce coffee are all member of 1 of the 3 farmers' organisations of that province: APECAP, APEOSAE and ACRIM. Of the 721 farmers that were member of these three organisations in 2010, 140 are directly involved in the program with VECO.

APECAP was the first farmers' association to be legally consolidated in 2002, gathering 167 coffee farmers in 2009. It seeks to improve the productivity and the quality of its farmers' crops, stimulate the commercialization of their products as organic and fair trade and is engaged in natural resource management. In 2006, **APEOSAE** was established as an association of small scale organic export farmers, to improve farmer families' living standards through stimulating farmers' productivity, improving nutrition and guarding environmental sustainability. It gathers 421 coffee farmers (anno 2009). In 2009, **ACRIM** was founded as a result of a decentralization of administrative processes within APECAP, sharing the former's aspirations. It gathers 124 coffee farmers who operate in the basin of the Mayo river. (López and Choez, 2009)

FAPECAFES (Federación regional de Asociaciones de Pequeños Cafetaleros Ecológicos del Sur), a federation of coffee farmers in the south of Ecuador, was established in 2001 out of four grassroots organisations, to capitalise on the commercialisation of associative production processes. This federation quickly gathered some 1,500 farmers from 3 provinces, with the aim of producing on a yearly basis some 500 tons of coffee and exporting it to Europe and the United States. Currently, 7 grass roots organisations (such as APECAP, APEOSAE and ACRIM) are member of FAPECAFES, with a membership at present of over 2000 coffee farmers, of which 600 also cultivate plantain. Recent studies indicates that 98% of the producers (= about 700 farmers) associated with APEOSAE, APECAP and ACRIM grow bananas on their farms, of which 52% are new plantations, the other 48% are producing already. On average, they sell between 150 to 525kg per month. Their plantain production area currently covers 200 ha, with another 165 ha ready for immediate cultivation and an additional 500 ha could be converted to intercrop plantain in the long run. (Vredeseilanden, 2011)

3.3.2. Collectors

The bananas are collected in storage facilities (owned by the farmer's associations) before being transported to processing plants. In the cantons of Palanda and Chinchipe there is currently only one such facility (Zumba), and another one is being built recently in Palanda is currently functioning. In the area where APEOSAE has its bases, there are another 3 such centres (El Pincho, Panguintza and Chimbutza). The collection and storage facilities are, however, inadequate to meet the supply of the farmers, causing delays that affect the quality of the plantains (often going to waste). (López and Choez, 2009). The bananas have a first processing in the storage facilities as they are washed, peeled and packed in (plastic) bags.

3.3.3. Processors

The main processing actors in Ecuador involved in the export of plantains or its derivatives are in order of relevance: Banchis, Exotic blends, ECOFRUT S.A., Frito Lays and Inalproces. There is also NutriCorp SA and San Lucas International Ltd. The latter produces chips in its processing plant in El Carmen (province of Manabi). Their chips are sold and distributed in the United States and Europe.

ECOFRUT S.A, an Ecuadorian snack company that produces plantain chips, is the only processor involved in the chain. It has a modern processing plant, located in Duran, near Ecuador's main port city of Guayaquil. The plant is equipped with the latest technology, with a processing capacity of 120kg/hr of finished quality chips. It follows guidelines outlined in the HACCP (Hazard Analysis of Critical Control Points) international food processing system. FAPECAFES has a trade agreement with the company for processing the plantain fruit. Once the process is finished, FAPECAFES is responsible for transporting the chips to the seaport, from where it send to the final market: France .

3.3.4. Wholesalers and Retail

National and International markets

Ethiquable is the biggest importer of fair trade products in France, including bananas, coffee and chips. It is a cooperative from Gers (France) that supports small scale farming in coopera-

tive organisations, since 2003. Its products are sold in over 4000 retailers (including major supermarkets) in France and Belgium (Benelux), as well as through their online shop.
So far, its demand accounts for only 5% of total plantain production in the area. The fair trade chips are sold to Carrefour. FAPECAFES manages and negotiates access for coffee and plantain products in the organic and fair trade markets. (López and Choez, 2009)

Local markets
Under the APECAP umbrella there are 15 small distributors of plantain for local market, whereas APEOSAE has 27 small and 5 big distributors among its bases. FAPECAFES establishes the commercial agreements between companies (like ECOFRUT) and the harbour of Guayaquil. (López and Choez, 2009)

3.3.5. Consumers

While domestic consumers do not attach any further rationale behind their consumption, international consumers seek to buy quality products to support fair trade farmers. The end-markets where they buy their food products are increasingly developing traceability standards to make sure that the food they sell complies with food safety standards.
As such, FAPECAFES does not have any market-related research to the profile of consumers of plantain chips or the international demand for it.

3.4. Chain supporters

There are several bodies involved in the support of the chain, be it with technical assistance and research (e.g. COFENAC, GTZ), financing and credit mechanisms (e.g. VECO Andino, BNF (National Bank of Procurement) or environmental protection (Ministry of Environment). The main ones are:

- **VECO Andino**, a Belgian NGO that seeks to improve farmers living conditions through the improvement of production chains, provides financial support for chain studies, among others.
- **FACES**, an Ecuadorian Foundation for Social and Community Support, has provided since 2008 credits and capacity building workshops to small scale farmers.
- **MAGAP**, the Ministry of Agriculture, Livestock, Aquaculture and Fishing, has been providing technical support, vaccinations and subsidies for farmers. Intercropping coffee and plantain has showed to be so adequate that right now, the Ecuadorian Government through the Agricultural Ministry is starting a 10 year program for renovating 50.000 Ha of coffee (both Arabica and Robusta) intercropped with plantain.
- **MAE**, the Ministry of Environment, has been responsible for environmental monitoring and management of the area, e.g. by granting forest exploitation rights and sanctioning infractions.
- **BNF**, the National Bank of Public Works, has been offering credits to farmers, as well as insurance and savings services. (López and Choez, 2009)
- **GIZ (the current GTZ)**, who has (co-)financed the local collection and processing centres for plantain bananas.
- **Regional Government (GPZCH),** Zamora Chinchipe provincial government intended to strengthen issues of the banana production chain, coffee, cocoa and other agricultural chains

- **ACSUR:** Spanish NGO who supports the chains of cacao, coffee and plantain via the Regional Government

3.5. Chain influencers

MAGAP and a whole gamut of subsidiary bodies (including COFENAC), have issued general decrees and laws regulating the agricultural sector. Producers of plantain obviously operate within this legal framework, but so far no specific legislation has been devoted to them. The same goes for all other ministries involved and their subsidiaries. Worth mentioning in this regard are the trade agreements with the USA and the EU, which lift tariffs on bananas. Most farmers in the province of Zamora Chinchipe are not aware of the legal framework to which they are bound. Also, there is little to no representation of the plantain farmers in the legislative bodies, further widening the gap between the two actors and causing farmers to lose out on opportunities in the legal framework. (López and Choez, 2009)

In Ecuador the intercropping system is traditional and never has been changed. In other regions (like Costa Rica for example) there has been a promotion of mono-cropping of coffee, in Ecuador this never took place, more because of lack of clear policies, but it is an important fact in the history of coffee and plantain.

3.6. Main problems/bottlenecks faced by coffee farmers in the plantain chain

A problem arose when family farmers discovered that their production capacity (coffee) was insufficient to support their families, particularly in times of crises, be it because of bad climatologic conditions or low market prices. Hence, FAPECAFES looked for chain improvements with the help of Ethiquable, a French importer of fair trade products. Together they looked into the coffee cultivation process and they explored the option of commercialising plantains, which were growing in between the coffee plants.

A general problem that FAPECAFES faces at the moment is the uncertainty in demand for plantains and chips. Currently, Ethiquable only buys a quantity of chips that requires an input of merely 5% of current plantain production in the province. Moreover, currently there is no demand for 25% of their monthly production, a share that would rise up to 33% if traditional cultivation methods would be improved. If production and storage capacity would increase as planned, the supply for which there is no demand would rise even further. FAPECAFES does not count with the institutional capacity to analyse properly the international market demand for chips or other plantain derivatives, nor to improve the commercialisation of its plantain products on the domestic and international markets. FAPECAFES is working on these capacities, and learning by doing (they are selling 12 containers each year so their knowledge and skills need upgrading). FAPECAFES has made projections for the coming years on the selling possibilities, and is executing a feasibility study for building a chip processing plant of their own.
Another impediment to the sector's growth is **the high cost of processing** plantains into chips and the complete **absence of organically produced** chips. Although the chips produced from Zamora Chinchipe's plantains already bear the fair trade label, the origin of the chips is insufficiently traceable to give it any organic label. (López and Choez, 2009) The problem at the processing level is the difficulty in obtaining the appropriate oil (which is organically certified). (VECO, 2011)

A third element to afflict the plantain's sector is the **absence** of a **government sanctioned framework** to streamline production processes and market chains. Efforts have stalled to implement an initiative that would stimulate and control production and marketing processes of the plantain and feed policies to increase the plantain's competitiveness on the market.

A fourth impediment for the plantain farmers (and others) is the bad **condition** of regional and local **roads** in the region, complicating the movement of goods, especially under bad weather conditions. **Collection and storage facilities** in the region are insufficient, causing delays in the primary processing, under-optimal use of labour and loss of produce.

A last important hindrance concerning infrastructure is the **absence of a factory** that could process plantain into organic chips, charging lower processing costs. APECAP, APEOSAE and ACRIM outsource the production of chips to ECOFRUT, a factory located in Duran, Guayas, nearby Ecuador's main port of Guayaquil. They charge a very high processing cost of the plantain. The 16 to 18 hour journey does not only make transportation costs soar (longer cooled transport), a lot of fruit goes to waste (up to 200 kilograms per transport unit) as it no longer passes the factory's quality control. Another limitation is the fact that they are not able to deliver organic chips (López and Choez, 2009)

4. Farmer organisation and its pathway towards sustainability

4.1. Underlying motives of FAPECAFES for investing in plantain chips

The coffee farmers of Zamora Chinchipe have traditionally, since colonial times, been growing plantains, but for the sole purpose of providing shadow to the coffee plants and for auto-consumption. In AEOSAE, they were also important as cash crop. The plantains from the coffee plantations were sold at dump prices on the local markets. This situation changed when **the coffee production did not result in sufficient income** for the farmers and their families, in part due to plummeting international coffee prices. Hence, FAPECAFES looked for chain improvements with the help of Ethiquable. Together they looked into the coffee cultivation process and they explored the option of commercialising plantain, which grows in between the coffee plants. ETHIQUABLE identified the plantain chips first, because of market demand. Afterwards, they studied the production's conditions.
This commercialisation started both on the domestic and international markets. Especially for the international markets, the organisations aim to meet the growing demand for fair trade and ecological products, such as chips. (Vredeseilanden, 2011)

4.2. Approach and actions of FAPECAFES

To answer the many challenges for plantain producing coffee farmers, FAPECAFES has sought support of outside actors to improve its institutional capacity in developing the plantain chain. These are, among others, Ethiquable (which has focused on the wholesale and retail of plantain chips from the processing plant to consumers) and VECO Andino (which collaborates with FAPECAFES on the value chain from cultivation to processing).

For the period of 2010-2013, FAPECAFES has planned actions to improve the plantain production chain's sustainability (economic, environmental, socio-cultural and institutional). (VECO Andino, 2011)

4.2.1. Actions of FAPECAFES contributing to Economic Sustainability

Increase farmers' income

The main objective of the interventions is to consolidate the plantain value chain and improve the income of the farmer families associated with FAPECAFES. This includes developing technical and commercial strategies to increase storage and processing capacity, improve the product's quality and boost sales on the domestic and international markets. There is a big focus on capacity development of the grassroots organizations and FAPECAFES, be it via workshops, consultancies or technical assistance to improve the plantain chain, from cultivation to commercialisation.

The production of chips provides coffee farmers with an extra income, although a considerable part of their production goes to low price channels. Finding new markets for their products will be key in sustaining an increase in the farmers' income. Before the cooperation between FAPECAFES and Ethiquable and their project on diversification, plantains where also grown as a shadow plant for coffee, but the management of the trees, and by this also the product, was of such a low quality that the prices were really low for the bananas. So now, not only do the chips give an extra income to the farmers, also the plantains do because they are now being sold as a quality product at higher prices. (Vredeseilanden, 2011) (VECO, 2011)

Develop long term relationships in organic and fair trade markets

Furthermore, technical, administrative and commercial capacities of the grassroots organisations and of FAPECAFES need to be strengthened, to ensure long term organisational and financial sustainability. Special attention will be devoted to develop long term commercial relationships in the markets of organic and fair trade products. Therefore, with the facilitation of VECO Andino, the organisation works on the creation and functioning of a Plantain Management Committee for the southern part of the Ecuadorian Amazon region, to create inter- and intra-regional partnerships and strengthen the bargaining position of plantain producers on a commercial and political level. (VECO, 2011)

4.2.2. Actions of FAPECAFES contributing to Environmental Sustainability

Promotion of organic farming

FAPECAFES seeks to promote a sustainable agriculture chain for plantain through diversification in production and cultivation of crops according to the standards of organic farming. In this respect, a proposal will be developed for technical assistance and technology transfers for sustainable plantain farming. As pointed out previously, the diversification of crops has also environmental benefits that contribute to more sustainable farming. FAPECAFES is exploring options for a technical service (consultancies of private companies) supporting farmers in the production of plantain using a sustainable agriculture approach. (VECO, 2011)

Reduce negative environmental impact of plantain chain

Special attention will be devoted to best practices in processing plantain and the treatment of waste generated during the storage and peeling stages of the production chain, to reduce the negative impact of these processes on the environment. FAPECAFES will be supported to develop environmental mitigation strategies. (VECO, 2011)

4.2.3. Actions of FAPECAPES contributing to Social/cultural Sustainability

Possible improved education and health care through higher income
Although no direct external support will be given to education and health care, families will spend part of their increased budgets on these areas. (VECO, 2011)

Promote gender equality
Although women are generally well represented throughout the production chain, the gender equality will be promoted in all aspects of the chain development.
Bananas are a typical crop where women are more involved with, instead of coffee, which is a crop managed primarily by men. So the increased attention towards bananas and the production of high qualitative bananas and the processing into chips all lead to a greater income for women in the region. Furthermore, women who did not have a job yet, get now more possibilities to work because more workers are needed to peel and wash the bananas. Besides the extra income, the voice and the value of women also improved because they are now involved in an important crop and cash inflow source. (Vredeseilanden, 2011)

Increased resilience to effects of climate change, economic shocks
Augmenting the group of coffee farmers involved in the plantain cultivation will make them more resilient for adverse effects of climate change, as a diversification of their crop portfolio spreads their risks, improves soil fertility and reduces exposure for the failure of a particular crop.

4.2.4. Actions of FAPECAPES contributing to Institutional sustainability

1. ***Representing farmers towards government/ sub-sector institutions etc.***
   - **Strengthening the plantain production chain**
     It seeks to strengthen the capacities of the Plantain Management Committee, a body within FAPECAFES, as to create better access to and influence decision making processes and strengthen the plantain production chain in collaboration with local authorities and other entities involved in it. Ideally, the committee will also be able to engage in independent fundraising for projects to strengthen and consolidate the plantain production chain in the southern Ecuadorian Amazon region. (VECO, 2011)
   - The whole intervention is geared towards boosting the capacity of the local farmers organisations, member organisations of FAPECAFES, in terms of market reconnaissance, cultivation techniques and commercialisation of their products, as well as **improving their representation at higher levels** (regional and national) FAPECAFES is one of the most recognised economical farmer organisations in Ecuador. This gives a lot of opportunity to demand services from local and national government. On the other side FAPECAFES has built up a good name as coffee producer within the international part of the coffee chain, looking at quality and continuity. Within the development of the plantain-chain the federation is working on this too, looking not only at the international market, but also to the local demand.

2. ***Contributing to an enabling environment for inclusiveness of small scale farmers***
   - **Improving storage and processing**

FAPECAFES envisages to improve storage facilities and primary processing (washing and peeling) within the ACRIM and APEOSAE constituencies, through the acquisition of equipment and tools as well as improvements in security on the work floor. Within the APECAP constituency, it will co-finance a better functioning of a new storage centre . (VECO, 2011)

- **Improved information access**
  FAPECAFES also envisages investments in information technology, so that the partner organisations have good access to the internet, efficient accountancy systems and information about markets, but also so they can diffuse information more effectively towards their bases. (VECO, 2011)
- **Governmental support**
  A more unified representational among the plantain farmers, will result in more effective lobbying at governmental level and stimulate the creation of government sanctioned frameworks to promote the plantain production chain. The experiences of FAPECAFES with intercropping have attracted the attention of the government and resulted in the support of a 10 year program (see also Chain supporters – MAGAP). In the program, intercropping coffee and plantain is one of the strategies for generating adequate income and it creates possibilities for producers to finance the establishment or renovation of coffee plots. The 38 million dollar program benefits 12,500 families of coffee growers, generating 315,110 jobs.

3. Improving the position of farmers in the chain

- By **boosting the organisational capacity** of the farmers organisations, they will be able to offer better support services, as credit, technical assistance and commercial management for their members and improve their own sustainability**.**
- **Improved business capacities and marketing abilities of the farmers.**
  FAPECAFES has planned to make a business plan for local market and export including profile of the national and international consumers
- **FAPECAFES** aims to bring the processing part of the production chain closer to the farmers as to **increase their control** over this part of the process and reduce transportation costs. The intervention seeks to incorporate all relevant production actors into this move. FAPECAFES is exploring an alternative for the actual processing plant (the alternative can be: a private plant which can produce organic chips on a good price, or an own plant of FAPECAFES), to reduces transportation costs and boost the processing of plantain chips. This would certainly enable farmer participation in the plantain production chain.
  A first feasibility study has given following results;
  - ✓ It will reduce the unitary processing cost (depending on the technology batch or in line)
  - ✓ It is financially feasible with positive indicators
  - ✓ It will allow to process organic chips and take advantage of market opportunities.
  - ✓ It will permit to manage quality control in processing process.
  - ✓ The cost efficiency can be positive, depending on the projected sales through time

Documents that can be requested

- López, F. M. and Choez, F. G. (2009). Análisis de la cadena platano. APECAP, ACRIM, APEOSAE, FAPECAFES, VECO Andino; Zamora Chinchipe. p. 93.

- VECO (2011). Impact Assessment: Report Data Collection; Programme 2008-2013. Vredeseilanden Country Offices, Leuven. p. 20.

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