



Belgium

Draft national report



Pictures : "Sugar Beets Field", Gilles San Martin (Namur, Belgium) and "Apple and Pear Diversity", Alexandre Dulaunoy (Belgium)

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GLOSSARY

EU	<i>"European Commission"</i>	
AFSCA	<i>"Agence Fédéral pour la Sécurité de la Chaine Alimentaire"</i>	National agency for the safety of the food chain
AMS		
Boerenbond		Farmer's Flemish Labour Union
CAP	<i>"Common Agricultural Policy"</i>	
CMO	<i>"Common Market Organization"</i>	
DS		
EHEC		
FADN	<i>"Farm Accountancy Data Network"</i>	
FAFSC	<i>"Federal Agency for the Safety of the Food Chain"</i>	
FAO	<i>"Food and Agriculture Organisation of the United Nations"</i>	
FAVV	<i>"Federaal Agentschap voor de veiligheid van de voedselketen"</i>	
GMO	<i>"Genetically Modified Organism"</i>	
LAVA		
MRL	<i>"Maximum Residue Limit"</i>	
NGO	<i>"Non-Governmental Organisation"</i>	
PDPO	<i>"Program document for rural development"</i>	
PO	<i>"Producer Organisation"</i>	
TTIP	<i>"Transatlantic Trade and Investment Partnership"</i>	
VBT	<i>"Verbond van Belgische Tuinbouwveilingen"</i>	association of Belgian Horticultural Auctions
VILT	<i>"Vlaams Informatiecentrum voor Land- en Tuinbouw"</i>	
VLAM	<i>"Vlaams Centrum voor Agro- en VisserijMarketing"</i>	Flemish Center for Agricultural and Fisheries Marketing
VLIF	<i>"Vlaams Landbouwinvesteringsfonds"</i>	Flemish Investment Fund for Agriculture
WTO	<i>"World Trade Organisation"</i>	

1 Introduction

1.1 Farming in Flanders

Flanders is the Northern region of Belgium, accounting for 57.68% of the Belgian population (SPF Economie, 2016). The population density in Flanders is 462 inhabitants' square kilometres, one of the highest in Europe and is rather homogeneous due to the diffuse spread of economic activity on the territory. This does not leave out much space for agricultural land but enables a rather good proximity between the agricultural sphere and the peri-urban population.

At the European level, the Belgian food sector is shaped primarily by its excellent location in the centre of highly populated North-western Europe and having the second biggest¹ sea harbour, that is, Antwerp, after Rotterdam (Eurostat). From an historical point of view, the current food sector has been shaped to a great extent by two developments that have their origin in the 19th century. First, Belgian horticulturalists and institutions were part of the newest developments in horticulture, as the development of horticulture flourished in the urbanized North-western Europe. Second, following the imports of cheap cereals, Flemish farmers followed the example of Dutch and Danish farmers taking opportunity of cheap imported feed to specialize in intensive livestock production. These historical stylized facts still shape the specialization of the country as in 2015, 88% of farmers were specialized in one of three subsectors: livestock farming, arable farming or horticulture (FOD Economy, 2016).

In 2013 total agro-food imports in Belgium was estimated at 19.508 million euro, while Belgian agro-food exports was valued at 22.131 million euro² (FEVIA, 2013). These figures point to the very open nature of the Belgian agro-food sector. Belgium is the EU's fourth food exporter (following Germany, the Netherlands and France) and Flanders represents 82% of its trade. Respectively 62% and 68% of imports and exports relate to neighbouring countries, although products such as beer, chocolate and potato products are traded worldwide (Samborski, 2016). According to *FAO* statistics, Belgium ranked eighth in the list of top food importing countries in the world, and ninth as far as food exports are concerned.

Nevertheless, the share of agriculture in the Belgian GDP decreases continuously and is anno 2015 below 1%. Moreover, the main trend characterizing the Belgian agricultural sector is the structural decline in the number of farms and the overconcentration of land (FOD Economy, 2016). This is similar to the overall European trend. 68% of farms has disappeared since 1980 while the land area of each farm has tripled up (FOD Economy, 2016). More concretely, in 2004, the average farm size was 17.9 ha whereas anno 2013 the average size is 25.0 ha (Beleidsdomein Landbouw en Visserij, 2014). The labour share associated to agricultural activities is characterized by a similar contraction. However, since 2013, the overall situation seems to have stabilized. Indeed, the share of agriculture in the GDP

¹ On the basis of gross weight of commodities handled.

² These numbers vary between the different sources, according to statistical artefacts that are not always very transparent. The Belgian Institute for Statistics values Belgian agro-food exports at 27.239 millions euro in 2013, while no information is given for imports. Then, according to the Belgian Agency for Foreign Trade, in 2015, imports of foodstuffs was worth 13.7 millions euros and imports of vegetables products was evaluated at 9.9 millions euros. For exports, Belgium exported 17.6 millions euros of foodstuffs and 8.1 millions euros of vegetables products (Belgian Foreign Trade Agency, 2016).

was 0.70% in 2015 (Statbel, 2016), which is very similar to the situation the two previous years. The same applies to the area of land used for agricultural activities and the number of farms.

Regarding organic conversion, even though the number of organic farms has increased sharply during the last years, going up by 9.3%, every year, since 2010, while total cultivated land has increased by 41.2% since this same year. Yet, it is still very limited and far below the EU average. In 2015, 5.12% of total land respected the organic principles in Belgium while it was the case for 5.9%³ European land already in 2014 (EUROSTAT, 2015).

Furthermore, statistics indicate that Flemish farmers are very innovative (Beleidsdomein Landbouw en Visserij, 2014). A recent survey performed by Flemish Department of Agriculture and Fisheries among 689 farmers in Flanders showed that over 40% of farmers introduced innovations in the period 2012-2013. In most agricultural sectors, these innovations are mainly focusing on the production process (Vervloet et al, 2015). In horticulture, innovations in the domain of marketing and product innovations are more common. This trend is in line with the historical rather business orientation of Flanders and its people.

Yet Belgian farmers, as the majority of their European peers, perceive their future as rather gloomy. In 2016, the Flemish Barometer is at his lowest point since it started to be collected in 2007 (Flemish Department of Agriculture and Fisheries, 2016). Farmers are unhappy with the agricultural situation of the last six months and are not optimistic regarding the six months to come⁴.

Finally, two stylized facts on the food supply chains are worth being mentioned for the understanding of a Belgian farmer sales opportunities. First, most of the value added is created by the food industry: while both agriculture and the food industry employ roughly the same share of the labour force, food industry generates almost five times more value added (Platteau et al. 2014). Second, most food is sold through the retail sector, which is highly concentrated: the 'Big Three' (Delhaize, Colruyt, both Belgian companies and Carrefour, a French multinational) represent more than 70% of the market share. The other main players are German retailers Aldi and Lidl. Small shops have virtually disappeared and local markets are insignificant. Figures for the relative importance of short supply chains are limited to on-farm sales and farmers markets. In 2012, on farm sales in Belgium represented 76.2 million euro of turnover or only 0.49% of all food sales. However, 21% of the Flemish population reports to have purchased on farm. Belgian farmers markets represent a total turnover of 15.3 million euro. Products purchased on farm are fruit (23.4% of all products bought on farm), potatoes (19.4%), vegetables (18.4%), meat (16.7%), dairy (8.8%), poultry (5.5%) and eggs (3%) (VLAM, 2013). Third, food safety is at a very high standard in Belgium, with a very low rate of pesticide residue and biological contaminants. This is due to focus on premium produce and on export, but is also the outcome of the 1999 dioxin crisis during which a large amount of meat had to be retracted from the supermarket shelves and which led to the fall of the Belgian government. In 2002 Belgium was one of the first EU countries to establish an exemplary food safety agency (AFSCA-FAVV). Auto-regulation and industry efforts in addition to legal and retail standards are widespread.

³ Area fully converted or under conversion

⁴ More specifically, the average barometer score for 2016 is 62 out of 100.

1.2 Selection of the case study

As sectors to be studied, it has been chosen to dig into the production of apple that is usually associated to pears, and the sugar beet crop. The choice of those commodities is explained by the following characteristics of them.

The first motivation lies in their importance not only at the Belgian level but also on the European market. Belgium is among the top three sugar beet-producing countries at the European level, regarding yield per hectare. The total sugar beet production in Belgium reached 4.45 Million tons in 2014. This equals 54.2% of all industrial crops, and 22.3% of all crops produced in Belgium during 2015. Then, open-air fruit production in Belgium consist mainly of apples and pears planted together on a single farm. Regarding pear production volume, Belgium ranked 3rd in 2012 at the European level, after Italy and Spain (FAOSTAT, 2016). However, Belgian growers are losing gradually more competitiveness on the European market of apples, incentivizing them to focus on pear production for which they are relatively more optimistic.

However, both sectors are facing a critical period, indicating the need for structural changes in both sectors. Moreover farmers on both sectors perceive their future as rather gloomy for reasons that are not necessarily obvious at a first glance. This constitutes the second motivation for choosing them. Indeed, the upcoming changes in the sugar beet sector due to the termination of the quota system make a detailed analysis of the entire sector necessary. Farmers of arable crops are rather pessimistic about the future of sugar beets production. Since 2012, they are each year less happy, mainly because they perceive the price received for their crops is too low (Flemish Department of Agriculture and Fisheries, 2016). Additionally, sugar beet represents an interesting case due to firm concentration on the manufacturing level, which might prove relevant for other sectors as well. Regarding apples and pears production, farmers have been facing tremendous market problems during the last 3 years. They have to cope with the negative effects of a structural oversupply reinforced by the Russian Boycott implemented in 2014 and are not more optimistic about what the future will bring to them. In 2013, they were among the most optimistic farmers, while after the Russian Boycott, the barometer index jumped downward at the lowest value within the horticultural producers (Flemish Department of Agriculture and Fisheries, 2016). In 2015, they were rather optimistic because the prices of apple and pear was at a good level. However, at the beginning of 2016, their optimism completely disappeared, given that the prices of apple and pear jumped downward by an additional 68% and 22% of them think that is going to last. Fridges are still much fuller than what they should be at this period.

Both sectors call for a reorganisation but seem not to find a clear common and relevant strategy. However, even though farmers used to adopt common and joined strategies in the past within both sectors, some stands up with different alternative strategies that are proving efficient. This reinforces the added-value of a micro-analysis of those sectors, as the heterogeneity of behaviours and situation cannot be efficiently deduced from macro-analysis. Moreover, farmers are facing situations that are either similar to, or result from, situations prevailing in other European countries under study, which enables the possibility of meaningful cross-analysis.

2 Media Content Analysis

The aim of the media analysis is to detect the different positions and approaches in the respective national media with regard to the overall objective of SUFISA: to identify practices and policies that support the sustainability of primary producers in a context of complex policy requirements, market imperfections and globalization.

2.1 Methodology of media analysis

This media analysis is based on 3 different types of sources: (1) popular press, (2) newsletter of the Flemish information centre for agriculture (VILT - Vlaams Informatiecentrum voor Land- en Tuinbouw) and (3) specialised policy documents. For each of these sources, we used a specific method to select the articles.

2.2 Conditions influencing the farmers' strategies and performances

Farmers' strategies and performance are heavily influenced by diverse conditions. In this report, we distinguish between 9 conditions: (1) regulatory and policy conditions, (2) factors conditions, (3) demand conditions, (4) finance and risk management conditions, (5) technological conditions, (6) socio-demographic conditions, (7) socio-institutional conditions, (8) ecological conditions and (9) territorial conditions. The aim of this analysis is to identify how media report on these conditions.

The selected sources of this media analysis are summarized in Annex 1 of this report. It concerns articles in public press (most popular Flemish newspapers), articles in professional press and policy documents. Details on the used methodology to describe the conditions that influence the farmers' strategies and performances are provided in Annex 3. This chapter is a reflection of media reports, and hence, it might not reflect the core issues that actually determine farmers' conditions, strategies and performances.

Overall, we observe that regulatory and policy conditions are by far the most reported conditions in the newspapers. Socio-demographic issues, on the contrary, are seldom issues in our Flemish newspapers. Furthermore, the conditions are heavily interwoven. We take the example of low prices to illustrate this. Low prices can be considered foremost a factor condition. However, low price is also directly related to consumers' willingness to pay for food. Furthermore, low prices might reflect the power of the different actors in the food chain that put pressure on the price of food. An overall view on the relations between the conditions is provided in the conclusion section of this report.

Table 2.1 gives an overview of a number of events that took place in Belgium between January 2006 and June 2016, and that had an impact on press reports.

Table 2.1: Events reported in the media in Flanders

Event	Timing	Explanation
Kiss action ngo's	Febr 2007	Action of a number of NGO to raise awareness on the power of supermarkets
Start Piet Vanthemsche Boerenbond	May 2007	Coming from the FAVV, Piet Vanthemsche became director of the famers' union
Potato incident	May 2011	Activists damaged a GMO potato field in Wetteren (Flanders) of the VIB (Flemish Institute for Biotechnology)
EHEC crisis	May 2011	In Europe, 53 people of which 51 in Germany died after infection. Also in Belgium, vegetable farmers suffered from very low prices caused by this crisis.
"Pukkelpop" storm	August 2011	On the 18 th of August, a very heavy weather storm hit the province of Limburg. Apart for victims at the music festival Pukkelpop, hail and heavy storm was a disaster for the fruit growers in the region
Launch Rundskop	2011	Belgian crime film written and directed by Michaël R. Roskam and starring Matthias Schoenaerts. It tells the story of the young Limburgish cattle farmer Jacky Vanmarsenille, approached by an unscrupulous veterinarian to make a shady deal with a notorious West-Flemish beef trader. But the murder of a federal policeman, and an unexpected confrontation with a mysterious secret from Jacky's past, set in motion a chain of events with far-reaching consequences. The film is based on the murder of Karel van Noppen.
Boycott Russia	Aug 2014	On 6 August 2014, Moscow announced an embargo on imports of a range of agricultural products from the EU. Pear sector suffered most from this embargo, as one third of the Belgian pear export has Russia as its destination.
TV program 'price of food'	Sept 2014	http://deredactie.be/cm/vrtnieuws/videozone/programmas/panorama/2.35547
DS series on food	Summer '15	Number of articles on food in De Standaard, with interviews of experts
Start Sonja De Becker	Sept 2015	Piet Vanthemsche leaves Boerenbond, Sonja De Becker takes over his position as director of the largest farmers union in Belgium.

It is remarkable that in the public media, only very few experts are mentioned. Piet Vanthemsche is by far the most present as actor in the debate. The public first got to know him as the director of the AFSCA-FAVV after the dioxin crisis. In 2007, when Piet Vanthemsche started as director of Boerenbond, he received a lot of media attendance. He is very well-expressing spokesman. Farmers, on the contrary, are seldom directly heard. The only farmers that really get a voice in the press are small-scaled farmers, some start-ups, though rarely conventional middle-size and large-scaled farmers producing for the export market.

At the sector level, meat and milk the most mentioned for various reasons: from the abolishment of milk quota, over the manure surplus, the financial situation of pig farmers, illegal practices related to the use of hormones to ritual slaughtering of lamb. From 2014 on, the apple and pear sector gained attention, as the Russian embargo had major impact on the Belgian fruit sector.

2.2.1 Regulatory and policy conditions

Regulatory and policy conditions are among the most cited conditions in the media. Within this category, we found 4 key topics discussed: (1) the Common Agricultural Policy, (2) Trade policy, (3) Support for research, and (4) Safety regulation. While the former are situated at the European level, the last issue – safety regulation – is mostly mentioned within a national context.

2.2.1.1 Common Agricultural Policy

- *Income support*

From the farmers' side, the need for farmers to get income support (DM08.03.08). Against the background of the crisis, such as the bluetongue epidemic, the farmers' union expresses the necessity to have a European disaster fund to manage risks in farming.

Against this request, we also see an increased number of farmers that claim for an abolishment of subsidies. It mainly concerns entrepreneurs starting as newcomers in farming, like a former sportsman who started a bison ranch in Wallonia (HN10.08.05).

In 2015, after farmers' protest in Brussels, the issue of income support is again in the news. While farmers request for market regulation, the European Commission only allows crisis support. This support should allow Belgium for example to invest in conservation of pig meat which should avoid selling below the cost price and investment in technology that should make pig farmers more competitive (DT15.09.16).

- *Quota*

Milk quota is a topic that has evolved strongly over time. In 2006, milk price was very low. DS06.01.14 explained why farmers did not use their quota optimally. Milk price is that low, that many dairy farmers had to close down. According to Leloup (Boerenbond), 9% of the dairy farmers stopped that year. The Belgian Dairy *Board* explained it as follows:

you can buy quota, but still you need to buy cows. If you have financial debts, there might not be enough budget left to buy cows (DS06.01.14).

In 2008, the quota are mentioned as an unhealthy instrument which motivated farmers to continue to produce despite bad market conditions (GvA08.03.08). Coming closer to the abolishment of the quota, we notice that the focus moves towards getting farmers ready for a market without production limitations. As the former director of the farmers union, Piet Vanthemsche, states it:

we have to prepare our famers for a world without quota (DS09.10.10).

- *Greening payment and rural development*

Regularly, the farmers' union emphasises the role that farmers play in rural development and nature management. In this debate, we found that numbers are often named. With Brussels as capital, the Belgian population is – at least on a yearly basis – confronted with farmers striking in Brussels. Journalist thereby mention how much of the European budget is spent on agriculture. Farmers' union seem to feel the need to make clear arguments to justify subsidies and other support measures for farmers. This is illustrated in an interview of a popular journal with Piet Vanthemsche:

40% of the European budget goes to agriculture. You say that farmers need to show that this is well spent. Is this the case? On a yearly basis, each Flemish citizen gives 119 € to the agricultural sector. This budget is spent on both agriculture and on rural development. The food is safe, of high quality and cheap. Farmers take care of nature and biodiversity. That work has a price.

We notice that farmers themselves see this greening payment from another perspective. They claim that the greening payment is presented more as a gift from the politics, who want them to work for all the subsidies obtained. For farmers however, subsidies are crucial because of the low food prices (DS15.02.11).

- *Vulnerability of Flanders – manure surplus*

Given the population density in Flanders and the intensive livestock sector, manure surplus is a hot topic (DS06.01.17). Flanders is recognized as a Nitrate Vulnerable Zone by the EU. The total Flemish agricultural area – 750.000 ha – is too small as compared to the amount of manure produced by the region's livestock. There is an imbalance between production and land (DT11.02.11).

2.2.1.2. Trade policy

- *Trade agreements – relation with US*

Regulatory and policy conditions for European farmers are regularly framed in the debate on food aid and agricultural programs in the South. A general tendency in these reports are the incoherence between the various levels of European policy. DT06.11.14 makes a very clear statement. The West should stop its protectionist policy, whereby it spends weekly more money on agricultural subsidies than on the yearly aid for undernourished children. A European cow gets 2€ per day subsidies, which is double an average African citizen. A similar criticism is articulated by Paul Wolfowitz - leading architect of the Iraq War under President George Bush's administration – who also questions the budget of the EU, the US and Japan spent on agriculture ignoring the negative impact on farmers in the South (DS07.03.15).

- *Export, barriers and embargo*

Flemish agriculture is foremost export oriented. Flanders exports for example the majority of its meat. That holds foremost true for the pig sector.

The green party want food to be 'local, organic, ecological and small'. This would also be a solution for the manure surplus in Flanders. Hence, export subsidies, supporting in fact large scale industrial agriculture should be abolished (DT14.05.17).

2.2.1.3 Support for research

Two items on research and support for research are mentioned in the media. On the one hand, patents of multinationals and the research on genetically modified organisms is reported (DM14.10.09). On the other hand, there has been some discussion in public media on the support for organic agriculture. The University of Louvain-La-Neuve investigated, on the request of the green fraction of the European Parliament, the budget spent on organic agriculture, which is – according to their research – only 10% of total expenditures on agricultural research. In this article, some current practices in organic agriculture were also outlined. (DS15.10.22).

2.2.1.4 Safety measures

As mentioned in section 1.3, Belgium was one of the first EU countries to establish an exemplary food safety agency (AFSCA-FAVV). Auto-regulation and industry efforts in addition to legal and retail standards are widespread. It is regularly emphasised in media that Belgian food is among the safest in the world (HLN15.05.15).

Nevertheless, whereas initially (period 1999-2003) the impact of farmers and small food manufacturers was a key issue in the debate, we see over the last decade other – more politically inspired topics – remaining. The ritual slaughtering of lambs is the most important one.

Ritual slaughtering is only allowed in professional slaughtering houses. Currently, still many slaughtering takes place without anaesthesia and outside of professional slaughtering houses (DS06.01.14). Although this debate was originally entirely related to animal welfare, food safety and hygiene regulation, it becomes more of a political issue where political parties try to gain votes from the increased Islamite citizens.

2.2.2 Factors conditions

2.2.2.1 Price of commodities

The price of commodities is specifically dealt with in the context of meat producers. In 2008, prices of feed raise with 50%, which is an enormous additional cost for farmers with livestock, pigs and chicken (DM08.03.08). Closely related is the power, or lack of power, of farmers within the food chain.

Farmers are between burning fires. On the one hand, you have large suppliers, like Cargill. On the other hand, there are multinationals like Unilever or Carrefour. Farmers just can't count in their actual cost (DM08.03.08).

Press considers in this context mainly the position of the supermarkets, with catching titles such as 'the profit of the supermarket'. Food industry as well as supermarkets react very fast on raising commodity prices. However, when prices go down afterwards, they do not follow this tendency. Hence, they grow their profits (DM11.03.05).

2.2.2.2 Energy cost

During strong winters or when energy prices raise, the cost of energy enters the media. Especially for farmers with heated greenhouses, the energy price is a key issue (HN06.03.14). Also in this context, media report that energy prices don't have an impact on the price that the farmer gets.

High energy prices made some farmers as well as truckers protest in Brussels. This kind of action, which block traffic and hence economic activity within the entire country, is not always well perceived by citizens. As articulated in the press, it is not clear what these activists actually want to reach (HN08.06.18).

2.2.2.3 Personal cost

The cost of labour is a very important condition for Belgian farmers. The main comparison made is the difference between Belgium and Germany. Cost of labour in German slaughterhouses, for example, is much lower than the cost of a worker in Belgian slaughterhouses. As a result, pig carcasses are transported to Germany where the meat can be cheaply cut. Furthermore, this explains why three large German slaughterhouses determine the European price of pig meat (DS11.01.13). The same argument is repeated in De Tijd (DT14.09.12)

2.2.3 Demand conditions

2.2.3.1 Power of supermarkets, food industry and suppliers

In previous sections on demand conditions and factor conditions, we mentioned the public perception on key actors in the food chain. Supermarkets are most heavily criticized, which might be due to the fact that consumer-citizens-readers have more affinity to the supermarket than to food manufacturing farms or suppliers of inputs for the agricultural sector. The broadest perspective can be summarized as in De Standaard:

There are less farmers than supermarkets. That is why supermarkets have much more power. After all, they just follow the clients' request for low food prices (DS07.02.15).

The spokesman of the food industry (FEVIA) claims in a public journal for example that we should not focus only on supermarkets as the bugbear in the food chain. Food is a chain, so talking about (too) low prices, should be a broad debate (DT14.09.12).

2.2.3.2 Consumers' willingness to pay

The central topic related to demand conditions is the demand for low prices. It was outside the scope of this analysis to include advertising, but low food prices are clearly one of the main triggers used by supermarkets. The longer the more however, public media reports on the ethics of low food prices.

In 2011, IKEA launched its action with extremely low prices in their catering sections. Boerenbond reacted on the spot that this price policy harms the agricultural sector. Such actions make consumers even more used to food prices that do not reflect the real cost of production. While consumers want

farms to be small and beautiful, the only way to produce food at bottom prices, it through large-scaled semi-industrial farms (HLN11.03.18).

A campaign by various NGO's in Flanders received a lot of press interest. The campaign aimed at raising consumers' awareness about the power of the distribution chain. The involved organizations requested actors in the distribution chain to agree on long term contracts with farmers. Furthermore, it was call-up for consumers to buy more products of sustainable agriculture (GvA07.02.13).

2.2.3.3 Food demand patterns

Belgian consumers are considered to be very critical. They want high quality food and a broad variation all year through. As for most European regions, there is an increasing awareness on health and sustainability of food consumption.

However, awareness on healthy diets and sustainable foods won't change the fundamentals of our diets. As pronounced by Vanthemsche "consumers will not choose for a diet based on potatoes with onion sauce just because that's would be the best choice for the environment" (DM08.03.08). Alternatively, there is a growing number of journalist that take up advocacy in favour of drastic meat reduction (DT10.10.15).

Each year, in November, the public government organizes the Week of Taste. During this week, one can observe many reflections on the consumers' buying behaviour. Although the Belgian consumer is considered to be Bourgondic, price and convenience determine consumers' behaviour. Small-scaled initiatives gain popularity, especially around larger cities, such as Brussels and Ghent. De Tijd summarized it as follows: consumers go to the farmers' market in Gaasbeek (near Brussels) to buy some fruit, vegetables and fresh cheese, but afterwards they stop at the supermarket and buy two full shopping carts of food for the rest of the week (DT07.04.14). In this sense, the Italian food culture is taken as the better example (BvL07.11.15).

2.2.3.4 Population growth

Despite the fact that population growth is a key condition for farming at the global level, it is not heavily discussed as such in the media. For sure, one journalist mentions, population growth does not explain the volatility of the food price (DT11.02.11).

From the perspective of Boerenbond, population growth is mentioned as one of the reasons why Flanders, should keep investing in agriculture (DM08.03.08). More people, 10 billion in 2030, will mean that the demand for meat will continue raise. We also note that figures on population growth are very diverse: from 10 billion in 2030 to 9 billion in 2050 (DT10.10.15).

In VILT, population growth was mentioned in the context of innovation in niches such as insects. Despite research investments, also in Flemish research institutes, insects are not yet widely accepted by consumers. However, according to the authors, they can be part of the solution for the global food challenge (VILT15.11.09).

2.2.4 Finance and risk management conditions

2.2.4.1 Speculation

Speculation seldom appears as topic in the media, which also holds true for speculation on food prices. Only 4 of the selected article in public media mention speculation. In 2008, Piet Vanthemsche referred to speculation of pension funds as a reason for the increase in the grain price (DM08.03.08). De Tijd reports in 2011 on the evolution of speculation on the food market. They state that in 10 years' time, the virtual trade in food has increased from 25% to over 50%. For speculation and futures market, only limited amounts are needed to get prices peak (DT11.02.11).

2.2.4.2 Liquidity

One of the crucial problems of farmers in liquidity. While farmers have capital 'stored' in their land and infrastructure, fluctuation in the commodity prices and low prices for their products, leads to a situation where the farmers are unable to pay their suppliers.

2.2.4.3 Access to credits

The famers' union underlines the importance of banks and insurance companies. In times of financial crises, each country pleats back on its own market. Especially with a capital intensive business like Flemish agriculture, characterised by risks, access to credits and insurance is important (DT11.06.02).

2.2.5 Technological conditions

2.2.5.1 Agricultural extension services

Innovation and know-how are often mentioned as conditions to explain the competitiveness of Belgian farmers. It is regarded for example as a key explanation for our tomato farmers being competitive with growers in the South of Europe (DS07.05.05).

2.2.5.2 Energy technology

Investment in glasshouses is also mentioned in reports on cheaper and environmentally friendly technology. Growers invest in the so-called combined heat and power installations are considered 'smart' farmers (DM11.04.23).

2.2.5.3 Research on genetically modified organisms

While in the past the debate on genetically modified organisms was mainly situated in the context of human health, we notice that the debate shifts towards the potential benefits of its production methods, the impact on farming and farmers' strategies (including freedom and dependency in choosing inputs). In 2010, De Standaard published a critical article titled 'dangerous science' on research and innovation in agriculture. The article was a reaction after a television program which

showed agricultural research and biotechnology in a very bad light. The television makers ‘forgot’ to mention successes like Bt corn and cotton. The article also pinpointed the need of innovation in the development of new varieties (DS10.08.20).

Another article, inspired by the same television program, articulates the voice of Greenpeace. Greenpeace warns thereby that genetically modified organisms can contaminate other crops and hence disturb the ecosystem (DM10.04.14).

2.2.6 Socio-demographic conditions

2.2.6.1 Farm succession, farmers’ ageing and new entrants in farming

Piet Vanthemsche very regularly refers to the decrease in farmer which evolved from 100.000 in 1980 to 24.000 in 2015. However, farmers nowadays, are professionals and entrepreneurs, producing way more food than ever before (DT15.07.11).

Another topic is the retirement of farmers. Often, retired farmers retain their land and production rights. The question could be raised whether these farmers still should get access to subsidies? For young farmers, this is a burden. Older farmers should be motivated to sell production rights to younger farmers (GvA08.03.08).

2.2.6.2 Rural development

Flanders is one of the most densely populated regions of Europe. However, rural development and rural policy should not be underestimated. Poverty in rural areas is often hidden. Living in rural more isolated areas is often less expensive than housing in urban areas. In this sense, rural areas attract poor people, young families as well as older people. The farmers’ union has a subdivision which focuses on rural movement – landelijke beweging – claiming that rural areas and agriculture go hand in hand (DS07.05.05). Embedding agriculture in rural society provides opportunities for diversification of the farm.

2.2.7 Socio-institutional conditions

2.2.7.1 Role of Boerenbond

Boerenbond was established in Leuven in 1890, as catholic, Flemish organization for agrarian entrepreneurs and rural citizens. From a political perspective, there are historically many links with the Christian democrats. They also stimulated the organization of farmers into cooperatives. In the Southern part of Belgium, Wallonia, the perception of Boerenbond is rather negative (DS09.10.10).

An interesting argument on the power of Boerenbond is made by former minister Dua, in an attempt to explain the conflict between Boerenbond and nature organizations. She argues that the power of Boerenbond in public policy depends on its economic value. In this regard, Boerenbond tries to keep as much land as possible, and avoids the shift from agricultural land to nature. Indeed, the more land, the larger the production and the higher the economic value of agriculture (DS15.07.10).

2.2.7.2 Monopolies in the food chain

The market of GMO is regularly reported on as “unfair”. Six multinationals dominate the market of GMO’s (DS11.05.28). Activists warn in media for the loss of biodiversity as well as the risks related to farmers depending on these multinationals.

A similar story holds true for supermarkets. Again, there are just a couple of ‘big’ players that dominate the market. Supermarkets abuse their power and terminology such as illegal monopoly is used to describe the current situation (DS13.02.23, DT14.09.12).

2.2.8 Ecological conditions

2.2.8.1 Global warming

The impact of global warming on agriculture production is most often reported on in the context of Nord-South relations and long term evolutions. We see this argument made for example in “Fair trade helps better against hunger (DT10.10.15)”. Food shortage might become a real problem in 2050, with a population of 9 billion people and dramatic impact of global warming. Russia is thereby considered as a vulnerable area, with decreasing grain yields which led to the prohibition of exports. Also in Australia, yields have decreased with 20%. One can expect the linkage between rain fall and yield to become stronger in the future. As a consequence, the price of grain will go up.

2.2.8.2 Diseases: bluetongue and blight of potato

In 2007, the bluetongue epidemic struck the Belgian livestock sector. In total 5000 companies were affected which led to an export ban of Belgian livestock. While public press focused on health issues and on the impact of the epidemics on our economy, specialized press focused on the key reason of the initially ‘exotic’ diseases in Western Europe (Unesco Vlaanderen 10/17).

Blight of potato, a disease that European farmers yearly costs a billion euro in terms of damage, is hardly discussed in the media. The only reference we found was related to the “potato war in Wetteren”, whereby a field of genetically modified potatoes was damaged by green activists. The article articulates both the concerns of the activists and the arguments of scientists (DS11.05.28). The research on genetically modified potatoes should lead to the introduction of a variety that is resistant to phytophthora and hence reduce financial damages to the farmers as well as avoid the use of thousands of tons fungicides.

2.2.8.3 Natural resources

In times of high energy prices and a growing awareness on the limits to fossil fuels, the opportunity of investment in renewable energy sources comes to the foreground. We already mentioned in section 2.2.1 the investment in combined heat power, especially by farmers with greenhouses. Apart from this tendency, there are a number of farmers that are ready to invest in production of energy crops. However, these farmers claim that government fails to support their activities (HN06.01.18).

2.3 Frames analysis

Frames on farming are narratives on how the structure of the sector is perceived. It can be described as mental structures through which people perceive the external world (Brunori et al. 2013). Frames articulate how people perceive reality and how they communicate about the reality. A frame articulates what people consider as solutions to construct a more sustainable food chain.

For this research, we distinguish between four frames on market power in the agro-food chain: the market frame, the power frame, the intervention frame and the relational frame. Table x shows for each of these frames its essence, the key concepts and the key advocates.

The main frame dealt with in the media is by far the market frame. This, however, does not imply that media report positively about the frame. The frame is however taken as point of departure for the majority of the articles. Furthermore, it needs to be emphasised that actors seldom explicitly rely on one frame to outline their ideas. On the contrary, most in-depth reports encompass elements from the various frames.

	Essence of the frame	Key concepts	Key advocates
Market frame	Antitrust regulation to ensure perfect competition	Competitiveness, private labels, brands	Policy makers, large food firms
Power frame	Building countervailing power through cooperatives	Cooperation	Farmers' union, cooperatives
Intervention frame	Public intervention into markets	Policy, intervention, regulation, subsidies	Policy makers, farmers' union
Relational frame	Collaboration between actors in the food chain, from producer to consumer	Quality products, social goals	Non-governmental organisations, farmers, cooperatives

2.3.1 Frame 1: Market frame

The market frame takes free trade and perfect competition as its point of departure, which implies perfect information and market transparency. Private labels and brands are thereby considered as a tool to reach transparency. Translation of the market frame in a context of food trade leads to a global picture where food is produced in optimal conditions, and hence at a very low cost. The market frame, as we elaborate in this analysis, accords with the free trade frame as discussed in Candel et al. (2014).

In the market frame, food is considered as any other commodity traded at the global market, without barriers or protectionist measures. Rational behaviour is hence the choice for best price for best quality. The market frame implies efficiency and the corresponding farm structure is characterised by large-scale enterprises, making optimal use of evolution in biotechnology. Genetic modification and monocultures hence fit the market frame.

Starting from the global picture, it is not surprising that the market frame is the most debated frame in the media. Flanders has an export-oriented agriculture, a strong biotechnology industry, a key food importer, and, with Antwerp located in Flanders also a hub for the rest of Europe's food market.

This is the frame that the Flemish agricultural sector puts forward when motivation for example intensification of pig farms where high quality and upscaling has gone hand in hand. The pig sector has traditionally been a sector that is not developed based on European subsidies, and hence it proves that Flemish agriculture is able to compete on the global market being competitive, export-oriented and hyper-productive. Yet, the green political party in Flanders – Groen - recall that the meat sector still profits from export subsidies. It fits their political agenda to defend an agricultural sector that is foremost local, organic, ecological and small-scaled. According to Groen, export subsidies should be abolished (DT14.05.17).

The market frame is also the main frame when debating the technological innovation and the value added of the Flemish vegetable sector. We refer for example to the Flemish tomato sector, who has to compete with Spanish tomato production. While 3 decades ago, one would expect that this was almost impossible, the sector has proven that – driven by know-how and right investment – they can compete with Southern Europe (DS07.05.05). As Europe expands and Eastern European competitors enter the European market; innovation, flexibility and diversification will remain crucial for Flemish farms to survive. In this sense, the farmers' union state that Flemish agriculture should continue to invest in niches, value added and quality rather than on bulk production of fresh food (DS09.01.28, DS15.02.13).

Despite the competitiveness of the Flemish agricultural sector, one can't neglect that the structure of our farm sector is small-scaled. Hence, the farmers' union emphasise that we should foremost focus on market close-by, such as Germany, the Netherlands, France and the UK (DS07.05.05).

The market frame hence implies competitive farms, that make use of technological and social innovation anno 2016. As articulated by Vanthemsche (DT07.04.14), this kind of farms are different from the farms as described in novels a century ago. The romantic small-scaled family farm is not part of the market frame.

The free market is also considered to provide opportunities for farmers in the South, who in the current situation face unfair competition against European farmers profiting from the protectionist European market (DT09.11.14). Rules of the free market also hold true for fair trade products. Fair trade organisations thereby claim that there are not a charity organisation. Also for their farmers, the games of competition apply. Fair trade producers have to be competitive as well. Only the food producer with the best price-quality balance, will get access to the market (DT11.10.13).

However, the market frame has many bottlenecks. We summarize some of the statements against the market frame. Food is not a commodity. Environmental costs are not internalised in the global market. It's a race to the bottom. And, finally, there are limit to growth.

Environmental friendly production.

A key argument against the market frame is the fact that externalities are not internalised on the global market. In other words, the food price on the global market does not reflect the real cost of production. The most frequent topics discussed in this context are environmental friendly production and animal welfare. While Europe sets out minimum standards for the European farmers, these standards are not applied at the global level. As formulated by the farmers union, there is need for common rules, a common playground. This is anno 2016 certainly not the case for all commodities (DS15.03.28). Furthermore, member states may have stricter standards than the European regulation.

This shortcoming is articulated by both the farmers union and non-governmental organisations – like Vredeseilanden, Oxfam-Wereldwinkels and Max Havelaar (DT07.02.15).

Free trade price is not a fair price

The farmers union is against the full liberalization of agriculture, which implies also dumping practices – not seldom hidden as food aid (DS09.10.10). They thereby claim that such a free market is neither good for the European farmer nor for farmers in the South (DM08.03.08). Free trade is not fair trade if it forces farmers to sell below cost price. From this perspective, we observe that non-governmental organisations active in the South and farmer unions in Europe defend a common purpose (DT10.10.15). Selling food below cost price is illegal and unethical, claims the farmers union. The case of IKEA's practice, with steak-frites sold for 2.5€, enforced this debate (HLN11.03.18).

One of the reasons why the price on the free trade market is not the fair price relates to the power of big players on both the supply side and the demand side of the food chain. Farmers and land owners have very little bargaining power as compared to suppliers of inputs, the food industry and the big retailers (DT08.06.03). Large retailers, for example, are considered to abuse their power by imposing specific rules to their suppliers and creating an illegal monopoly (DS13.02.23). The *race to the bottom* is the slogan most mentioned against the market frame.

The power issue becomes even more relevant in the case of biotechnology, and more specifically the use of GMO technology in farming. Especially non-governmental organisations warn for the unequal balance of power in the food chain is the focus of the power frame (see section 3.2).

Differences in loan costs are another element in the debate against the market frame. As outlined in section 2.2.1 on factor conditions, loans in the food sector across European member states differs significantly. For Flemish farmers, where minimum loans are much higher as compared to Germany or Poland, it becomes hence very tough to remain competitive.

Moreover, the farmers union mentions the need for 'safety nets' for farmers. This is where the market frame and the intervention frame come together (DS09.10.10).

2.3.2 Frame 2: Power frame

The power frame is characterized by cooperation within the food chain. Actors cooperate in order to build up countervailing power. The advocate of the power frame is the farmers union. Representing 69.000 families, they are considered as the most important farmers' lobby organisation in Flanders. Boerenbond is also part of the "Groep van 10", which bundles the 10 most important negotiators of the federal Belgian social partners (DT14.03.22). Apart from Boerenbond, the agricultural sector counts many other organisational structures that aim to enforce the voice of farmers. The Flemish fruit and vegetable sectors were pioneers in the development of auctions, a cooperative for farmers.

As reflected in this media analysis, Boerenbond has a prominent role in the Flemish food sector. Boerenbond strives for a better bargaining power of farmers, which is way too weak as compared to the multinationals operating in the food chain (DS09.10.10). Simultaneously, Boerenbond stresses that they are not making decisions for the farmers. Indeed, despite their efforts on advocacy of farmers, they are also heavily criticized as having too much power themselves. Boerenbond is, as an organisation, strongly interwoven with many and diverse actors in the food chain including for example the KBC holding (bank and insurance sector). In the article titled "My farmers are free", Vanthemsche

clarifies that Boerenbond is not making any decision at the farm levels. Farmers are free to decide who they cooperate with, where to buy inputs and whether or not to be involved in cooperatives.

Devisch – former director of Boerenbond – stated in 2008 that a new cooperative movement is taken place, with farmers buying machinery together. And indeed, we observe that there is a wide variety of cooperatives arising. Nevertheless, the power of these cooperatives is questioned. De Tijd made a critical reflection on cooperatives in agriculture (DT11.02.11). One of the statements in the article is that agricultural cooperatives in the West overshoot their target. They are mature players on the food market, aiming to increasingly grow market share. They employ personal and need a robust financial structure able to provide a safety net for the farmers in times of crises.

Discussing the power frame, we also draw attention on the efforts of retailers to further build up power. Supermarkets also organize themselves in purchasing groups, linking up with food chain actors in other member states. Chris Claes, director of the non-governmental organisation Vredeseilanden, warns that such a conglomerates have the profile of cartels. Cartels are illegal, and hence, intervention is needed (DM11.03.05).

Finally, the power frame is also relevant in the debate on fair trade of food products. Farmers in the South that want to enrol in Max Havelaar, for example, first need to organize themselves as a cooperative. Such a cooperative can apply to become supplier for Max Havelaar, and as such, can also receive bonuses to invest in better infrastructure (DT11.10.13).

2.3.3 Frame 3: Intervention frame

The intervention frame starts from the idea that policy intervention is needed in the food system. The intervention frame implies that you can't consider food as any other commodity and leave food provision over to the free market (GvA08.03.08, DT08.06.03). The statement: "food is a right, not just a merchandise" expresses this opinion (DS09.10.10). The intervention frame can be positioned as the counterpart of the market frame. In the media, they often appear together with arguments pro and contra.

Policy intervention is a broad concept, and diverse instruments are applied and debated. Within a context of European agriculture, the Common Agricultural Policy is for sure the most relevant. However, the food system is a global system, and interventions have their impact outside Europe as well. In this context, the intervention frame also implies topics as trade policy and development policy.

Within the global context, several Flemish stakeholders plead for an international referee (DS15.02.13). One may expect the World Trade Organisation to take this role. However, as articulated by Gert Engelen (NGO Vredeseilanden), the WTO enhances the tendency towards low prices and upscaling (DS07.02.15). Vanthemsche confirms this idea, and articulates the hope that the high food prices lead to increased awareness among policy makers on the fact that free trade – as formulated by the WTO – is not the good solution (DM08.03.08). Additionally, it is argued that free trade is harmful for the average farmer (worldwide) and supports the growth of powerful multinationals (DS09.10.10). In this discourse, farmers union and non-governmental organisations seem to unite, which leads to an increased solidarity between farmers in the West and their colleagues in the South (DT10.10.15).

Vanthemische recognizes that almost half of the European budget goes to agriculture. Nevertheless, he also reminds that this budget is financed by Europe, with only limited national support. In this sense, agriculture differs from other sectors. Moreover, not all farmers get subsidies, it mainly concerns arable agriculture and beef farming (DT07.04.14).

The intervention frame is also linked to the position of Europe against the rest of the world. Thereby, a key topic is how European agricultural policy disrupts the agricultural development in the South. Prof Miet Maertens (KU Leuven) confirms this point of view: “Companies do not structurally exploit farmers in the South. It is policy, such as the European agricultural subsidies, that causes the problems for farmers in the South (DT11.10.13). An article on the situation in Congo pronounces this idea even stronger, when reporting on an interview with Paul Wolfowitz, former US minister of defence.

The budget that the US spends on the cultivation of cotton, should better be used for development aid. It is a blame that in the EU, the US and Japan, 260 billion dollar is spent on subsidies of their own agricultural sector, often at the expense of farmers in poor countries. I might bring myself into problems saying this. People are free to debate on defence policy. The point is that we are not talking about enormous amounts of money, if we discuss on 0.7% of our available budget. There is still 99.3% left (DT07.03.15).

The Common Agricultural Policy has been reformed and further reforms are being debated. The shift from a market and price policy towards income policy is generally considered as the natural way forward (DS07.05.05). The farmers union considers income support as a necessity and warns for upcoming diseases like bluetongue. Such diseases will raise the need for a European disaster fund for farmers (DM08.03.08).

The intervention frame also brings up the notion of dependency and self-sufficiency. Although self-sufficiency at the national level is considered irrelevant, food dependency within Europe is debated. Two arguments are thereby put forward. On the one hand, Belgian consumers want Belgian food products (even if they are more expensive). On the other hand, we would be very vulnerable depending entirely on the rest of the world for our food provision. Vanthemische (DS09.10.10) expressed it as follows: “We don’t want to dependent on Russia for our energy supply, why would we depend on Brazil for our food?”.

Finally, subsidies are considered necessary as long as external costs are not internalized and added values of farming are not (economically) recognized (DT10.10.15). One can think of environmental costs related to farming. Europe has a very strong regulation when it comes to for example food safety and environment. Such efforts of farming need to be considered in the debate on policy intervention and liberalization. European farmers hence need protection against free trade agreements, like Transatlantic Trade and Investment Partnership (TTIP) (DS15.03.28). In addition, we mention the role of farming in the development of rural areas. The farmers union expects the agricultural policy to shift more towards a rural policy, which is the second pillar of the CAP. Overall, animal diseases, animal welfare and spatial planning are expected to be topics for the future CAP (GvA08.03.08).

2.3.4 Frame 4: Relational frame

The relational frame is the fourth and last frame we examined in this media analysis. In this frame, the concept of collaboration between supply chain actors dominates. Through collaboration, often formalized, mutual interests are combined which should lead to a more fair food system. The relational frame can be found complementary to the intervention frame, where producers unite themselves in supplying groups of consumers. The relational frame can also be linked to the intervention frame, e.g. when food chain actors request policy support to enrol fair food systems.

From a territorial perspective, we distinguish three approaches in the media. First, we found advocates of the relational frame with a focus on Nord-South relations. This story line is especially developed by non-governmental organisations. Second, the relational frame applies to the agreements at national level between key actors in the chain. Third, the relational frame covers the idea of reconnecting local food producers and consumers. We will elaborate both approaches successively.

Relation frame in Nord South perspective. Several non-governmental organisations bundle forces to plead for more long term contract and price agreements with farmers in the South. An event organised to enforce their statement reached the popular press (GvA07.02.13, HLN07.02.15).

Relational frame in national context. Again, the farmers union takes up some of the arguments in the relational frame. Their viewpoint is that it is an illusion to think you can regulate the market mechanisms. The only thing you can do is trying to get good agreements with the actors in the food chain (DT07.04.14). Indeed, we see an evolution towards contract prices. However, the farmers union states that – at least for milk – these prices are too low to cover the production costs (DT11.02.11). Since 2009, there is a chain consultation, a platform that unites a number of key actors in the food chain which aims at a sustainable development of the Belgian agro-food chain. In 2010, this resulted in a code of conduct on fair relations between food suppliers and buyers in the food chain. As the farmers union’s director states: “Top quality products for the price of rubbish is an unethical practice (DS15.07.11)”.

Another tendency that needs to be mentioned here is the fusion and cooperation between important players on the Belgian food market. One such deal was made between Greenyard and the auction in Haspengouw (DS15.07.11). Hein Deprez, director of Greenyard, states that his aim is not the lowest price. His goal is the position of Belgian agriculture as a whole, with sustainable contracts.

Relational frame and local niches. Focusing on the local initiatives, we observe that the relational frame is pronounced in a diversity of food niches, often small scaled initiatives. The best known example is Voedselteams, where producers are brought together at the local level, providing weekly food baskets to a group of consumers. The initiatives counts about 160 teams in Flanders (HLN15.02.07). Fair price and collaboration, rather than cheap food, is key to Voedselteams. Furthermore, Community Supported Agriculture (DS15.12.08) gains attention in media.

3 Belgian Case Study A: Apples and Pears

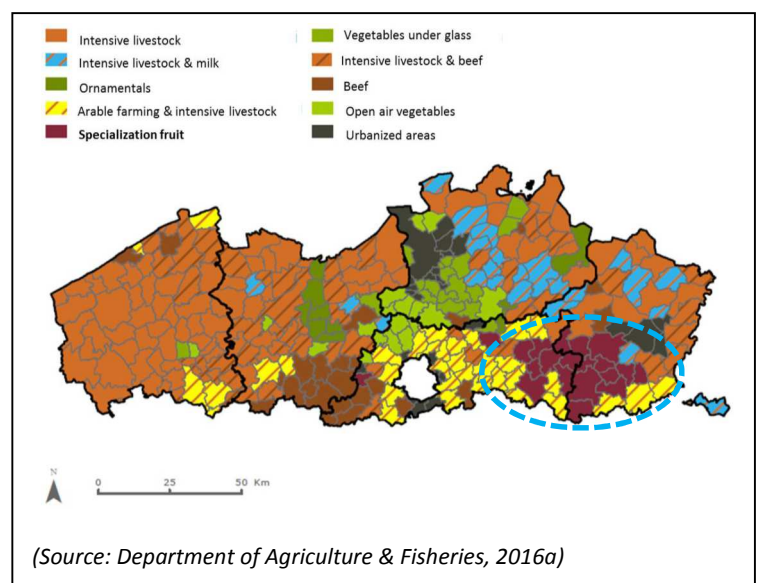
3.1 Case study introduction

3.1.1 Apples and Pears: a strategic alliance

Population and concentration

In Flanders, approximately 16000 hectares are allocated to fruit production. It corresponds to one percent of the total Flemish area and 2.5 percent of its total agricultural area (ADSEI, 2011). Interestingly, the extent of this area has remained constant since the end of the nineties (Annaert et al, 2014).

In 2013, the fruit sector in Flanders counted 2,007 farms, of which 81.9% grew fruit in open air (Department of Agriculture & Fisheries, 2016b). These farms accounted for almost 90% of the total Belgian production of open-air fruit with the entire production being located around Sint-Truiden, that is in Limburg and Vlaams Brabant (Delombaerde & Lambrechts, 2014). This open air production consists mainly of apples and pears, often planted together on one farm. It reflects both the high specialization rate of the Flemish fruit sector and a high concentration of its production capacities.



Those are mainly family farms as usually the farm manager is the only full-time employee, in some cases accompanied by family members. However, the fruit sector employs about half of total seasonal labor, which is mostly supplied by foreign workers. An important characteristic of orchard fruit production is the long rotation period of the trees, which is approximately 10-14 years for apple trees, while for pears it can run up to 25 years or even longer (Van Bogaert *et al.*, 2012; Demeyer *et al.*, 2013).

Over the period 2001-2012, the number of Flemish open-air fruit production firms decreased by 43%, from 2,973 to 1,700, while the total acreage of apples and pears combined has remained relatively stable. This indicates an increase in concentration and scale. However, the horticulture sector having already reached a specialization rate of up to 90% in 2005, it does not have any additional margin on this side (Platteau *et al.*, 2014). Then, some vertical coordination is happening as some farms have integrated the tree-growing and marketing steps. These trends result in the coexistence of large-scale and small-scale farms (Delombaerde & Lambrechts, 2014; Department of Agriculture and Fisheries, 2016a; X100 report, 2016).

Revenue and production size

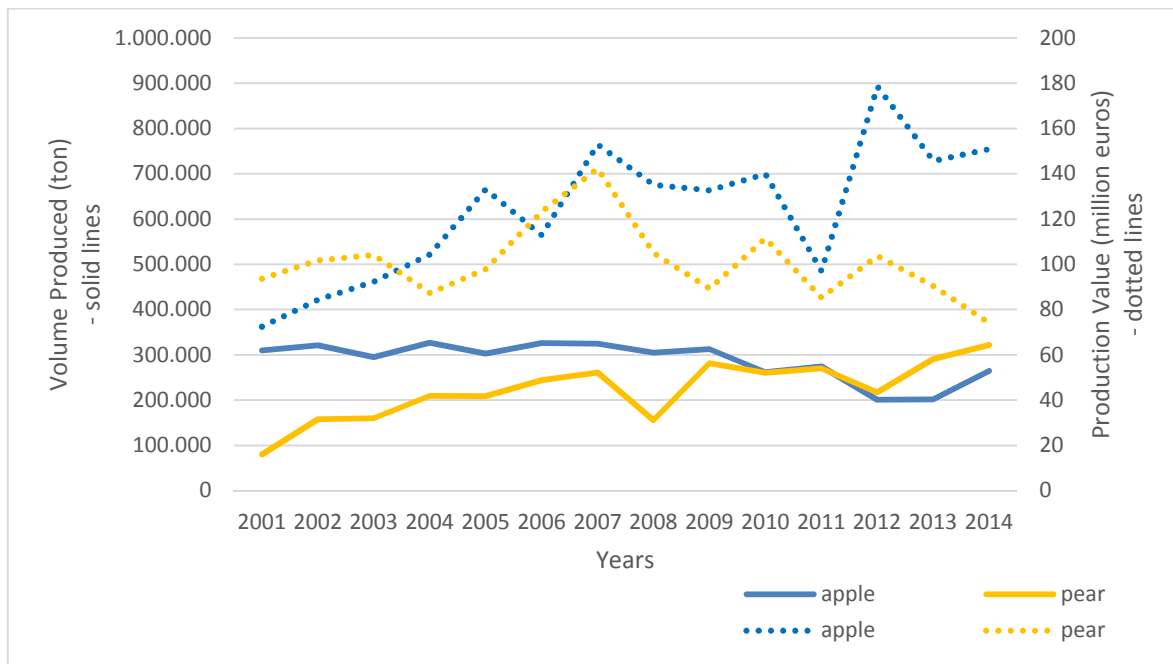
Overall, revenues of apple and pear producers are quite high compared to their horticultural peers. 75% of them earns more than 150 000 EUR a year while slightly more than 20% earn more than 500 000 EUR (Vervloet et al, 2015). In term of productivity per hectare, apple and pear producers are not doing so bad relatively to the rest of the sector in Belgium. Within their group of open-air producers, they rank 3rd, after strawberries and red/blue berries producers, with 17 954 EUR/ha in 2014 (Vervloet et al, 2015).

The production values display stylized facts that are coherent with the previous description of the sector (Figure 3.1a). In 2014, the total fruit sector was worth 370 million euros, of which apples represented 74 million euros and pears 151 million euros, that is 60.8% of the total sector for the sum of both commodities (Department of Agriculture & Fisheries, 2016a).

Interestingly, the nominal production value of pears has an overall positive trend over 2001-2014, while for apples the trend seems to be negative over the last decade (Figure 3.1a, solid lines). In the same vein, the last decade has been marked by a substitution process of apple for pear production. More concretely, the apple acreage incurred a relative decrease of 24% while the pear acreage increased by 49% over the period 2001-2014 (Figure 3.1b). This trend started around 1995. Since 2007, the pear acreage is higher than the apple one, while the volume of pear production caught that of apples up from 2012 onward (Demeyer *et al.*, 2013; Department of Agriculture & Fisheries, 2016a, 2016b). According to stakeholders this transition is driven by the higher margin associated to pear production given their higher price and lower costs relatively to apple production. The bigger comparative advantage of Belgium on this market helps foreseeing better future perspectives for the production of pear than apple. Hence, the apples sector in Belgium is often mentioned as being “in crisis”.

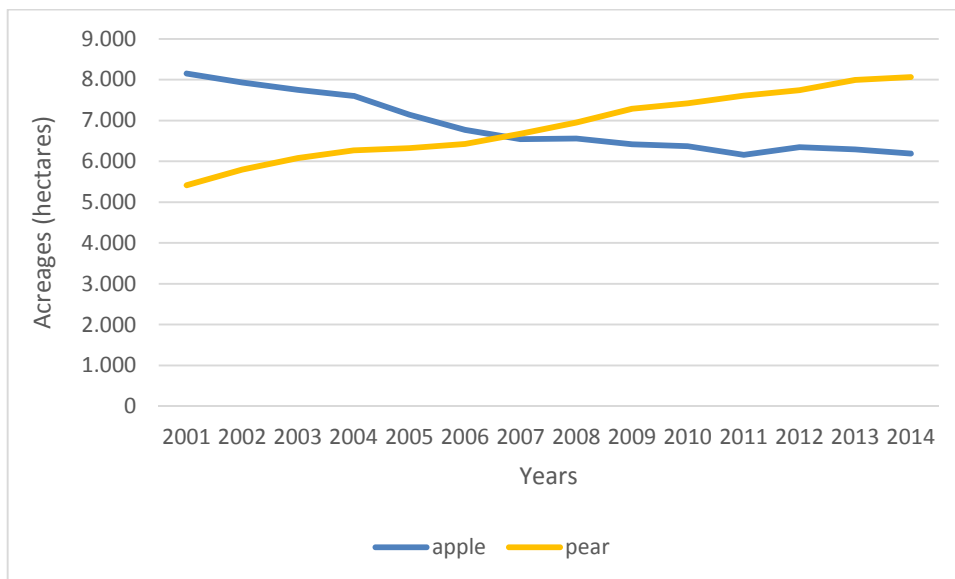
Finally, what is striking from the comparison of volumes and production values contained in figure 3.1 is that the former is characterized by a nearly linear trend, while the latter fluctuates sharply. This reflects that prices fluctuate a lot, as confirmed by figure 3.2, for reasons that are not necessarily driven by normal market effects. This phenomenon is rather not well-documented for this sector and would be worth being investigated further.

Figure 3.1a: Flemish Production Value (millions euros) and Volume of Apple and Pear produced in 2001-2014 (tons)



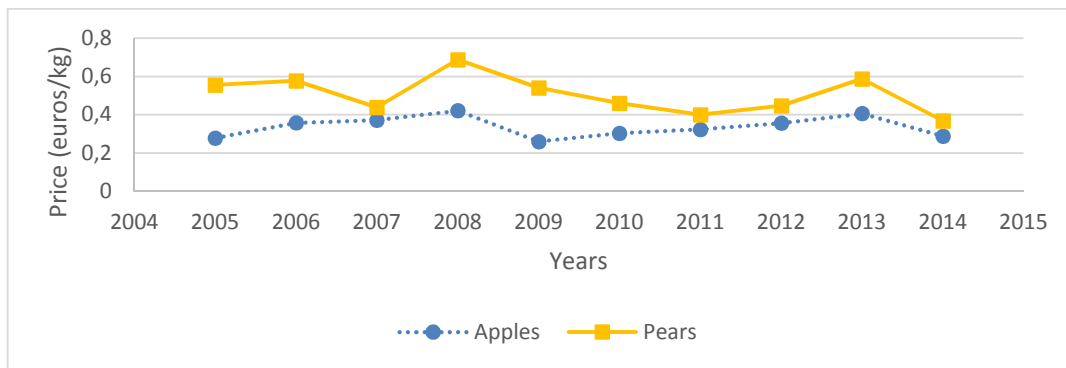
(Source data: Eurostat (Comext) 2016, Department of Agriculture & Fisheries, 2016a; Graph: own construction)

Figure 3.1b: Flemish Acreage of Apple and Pear produced in 2001-2014 (hectares)

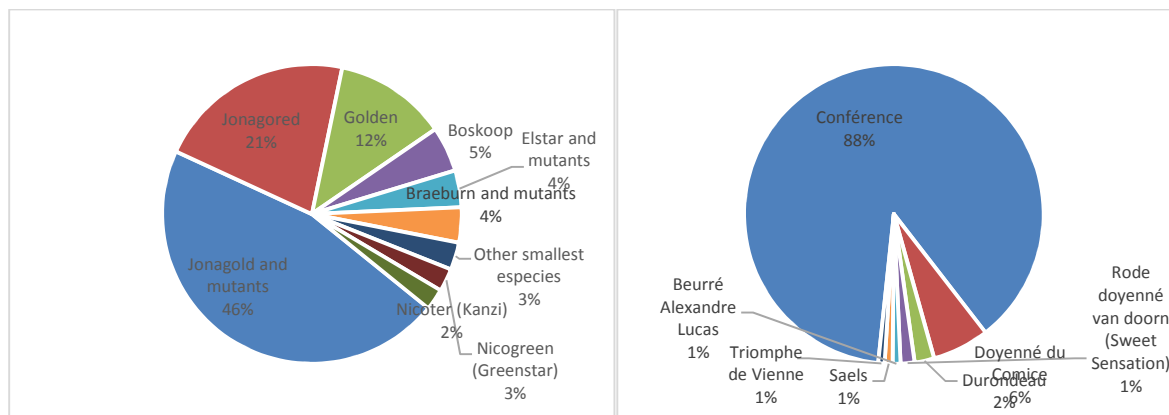


(Source data: Eurostat (Comext) 2016, Department of Agriculture & Fisheries, 2016a; Graph: own construction)

Figure 3.2: Flemish Producer Price Evolution in 2004-2014 (index based on 2005)



(Source data: VBT 2015, Graph: own construction)

Figure 3.3: Share of Trees per main Cultivars of Apple (a) and Pear (b) produced in Belgium in 2012⁵

(Source data: Statbel, 2012; Graph: own construction)

Cultivars and diversity

Regarding apple cultivars, the three most planted ones are *Jonagold*, *Jonagored* and *Golden* (Figure 3.3), covering 79% of the population of trees in Belgium. Many other cultivars are planted on a smaller scale, among them the *Kanzi* and *Greenstar* which are highly restricted club varieties and account for respectively on 2.09% and 2.27% of the Belgian apple trees. Note that less frequent cultivars are usually planted on smaller farms while the three most planted cultivars are confined in large scale and intensive production entities⁶. Regarding pears, the level of specialization of the Belgian sector is even more accentuated. Indeed, the *Conférence* cultivar made up 87% of the acreage and the trees in 2015 with 7,202 ha on a total of 8,317 ha (Statbel, 2016). Overall, this makes farmers and the entire sector very vulnerable toward negative export shocks. Moreover, risk sharing opportunities within producers organisation is then rather limited.

There is no data about the exact age of trees, neither about how replanting happens and is planned. However, and interestingly, from the data of the national institute for statistics, it is possible to deduce that almost 20% of the acreage is hosting rather young plantations, that is being at maximum 5 years old. Yet, among those young plantations, on 73% of them, the three most important cultivars where

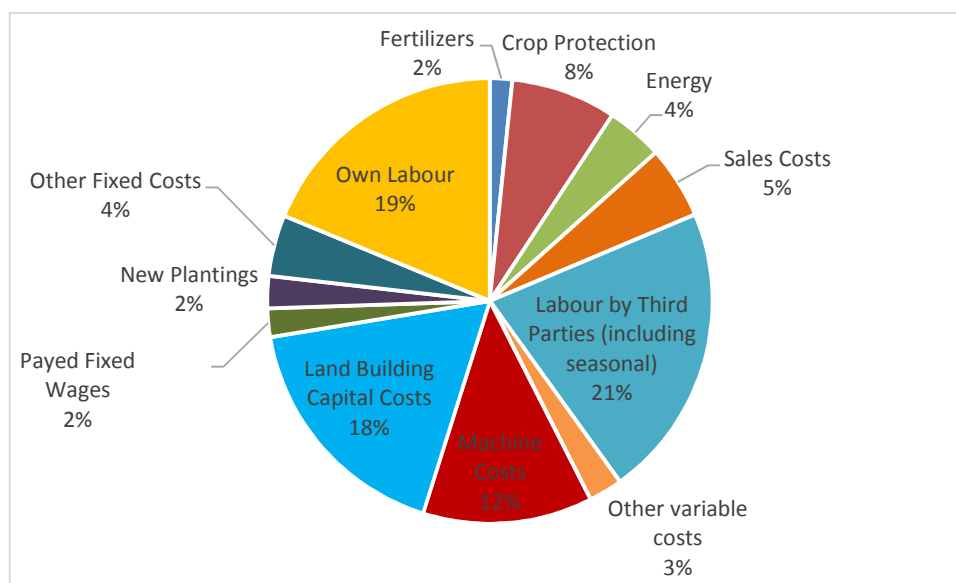
⁵ threshold fixed at 2% of total apple/pear trees

⁶ 62% of the fruit acreage are dedicated to relatively intensive production, that is 1600-3199 trees per ha, of one of the three biggest cultivars.

planted. Regarding club varieties, 93% of the *Greenstar* are on plantation being 5-14 years while it is the case for 87.3% of the *Kanzi*. This reflects not only that both are rather recent on the market in Belgium but also that new seeds are distributed in a rather parsimonious way.

During interviews, we were told by growers that apples are mainly meant for the national market while pears, and thus conference, are for the international one. In fact, Belgian apples, and in particular *Jonagold*, are of rather similar quality to the Polish production but they suffer from higher production costs. Hence, Belgian farmers are not competitive on this market. However, in Belgium they still survive because of direct connection to the market, and maybe, consumer preferences for local products. To the contrary, pears are rather rare and high value products for which Belgian farmers are more competitive.

Figure 3.4: Cost Profile on Open-air Fruit Production Firms in 2013



(Source: Department of Agriculture & Fisheries, 2016b; own translation)

Production costs

Finally, in order to anticipate the major factors that might affect a grower's vulnerability and competitiveness, it is informative to dig into the cost structure of apple and pear production⁷. To do so, figure 3.4 represents the distribution of costs on a typical open-air fruit production firm. The highest cost is labour by third parties, constituting about one fifth of the total cost. Other major costs are capital cost associated to land and buildings (18%), machines (12%) and crop protection (8%). Another 5% of the costs is for the sales process (Department of Agriculture & Fisheries, 2016b).

⁷ Note however that we are not yet in a position to compare costs associated to both types of production. Such an analysis is planned for future research given that one of the main argument explaining the switch from apple to pear is the lower costs associated to the latter.

3.1.2 Horizontal Cooperation: the importance of Belgian fruits cooperatives

Belgium has a long tradition of producer organisations and was a pioneer in this regard. The majority of cooperatives are recognized as producer organisations and hold a very specific legal status. Apart from vegetables and fruits, the main sectors that count such organisation is the dairy sector. In the fruit and vegetables sector, 83% of the producers are members of a producer organisation. That is, for fruit and vegetables, cooperatives hold about 85% of the market share and, most notably, about 70% is for export (Gijssels and Bussels, 2012). Hence, within the top 50 of the biggest cooperatives in Belgium, a big share goes to the fruits and vegetables and most remarkably for us, to the apple and pear production in particular⁸. The biggest cooperative in the fruit sector is the “*Belgium Fruit Auction*”. All auctions, whatever the sector they belong to, are organized into an umbrella institution called the association of *Belgian Horticultural Auctions*, commonly known as “*VBT*”⁹. Note that many auctions have disappeared during the last decade because they have been merged into bigger ones.

The main role of these auctions is the reduction in a single-farm marketing costs by sharing the costs for sorting, cooling, storing and selling (Annaert et al, 2014). However, the central pillar of the cooperatives is the auction system. The auction consists in a clock system that fixes prices for the entire aggregate supply of the producers that are members of the cooperative. On a day to day operational aspect, it takes the following form. First, producers bring their products to the cooperative, quality is controlled and fruits are sorted and assign a quality classes. Then, bundles of products are sold using the principle of the Dutch auction, that is, prices start high and are then decreased. Auction prices become reference prices for the entire market, on a day-to-day basis. According to farmers, the share of production value that the farmer must give away for marketing costs is 3-4%. Prices of future sales are also sometimes negotiated (Van Bogaert et al, 2012; VBT, 2015).

Beside the auction, the role of cooperatives is very widespread and evolved during the last decade. Traditionally, it dealt mainly with auction sale, administration, product control and logistics such as collection, storage and transport (Gijssels and Bussels, 2012). Today, this role has expanded to quality control for processes, intermediary for sales, help in planning production, marketing, innovation support, wholesale, import, export and general advices to their members.

However, in reality, from the traditionally lively auction it remains nowadays only the relic, that is, auctions are much less crowded than they used to be. This historical evolution is mainly explained by the possibility of online transactions and the reduction in the number of retailers. Hence, the main role is nowadays the facilitation of market access and the collectivization of marketing costs as a way to benefit from economies of scale and to increase the bargaining power with powerful retailers. This evolution is accompanied by a decrease in the commitment of members to the traditional form of auctions and the emergence of new organizational forms closer to the current need of farmers and the market. More integration is also observed, both horizontally and vertically. Horizontally, organizations tend to cooperate (through simultaneous sales) and even associate beyond borders, in order to answer to bigger aggregated demands and expand the range of its supply. Vertically, auctions coordinate with actors downstream the supply chain, such as wholesalers and retailers. Concretely, this means that those actors buy a non-negligible share of a given producer organisation, conferring them decision power, which might question producer’s sovereignty and profits redistribution.

⁸ See Gijssels and Bussels, 2012 who performed a survey on a sample of farmers.

⁹ VBT stands for “*Verbond van Belgische Tuinbouwveilingen*”, in Dutch

3.1.3 The impact of the Russian Boycott

The Russian ban on European fruits and vegetables was imposed to start on August 7, 2014, as a reaction to political tensions between the EU and the Russian's leaders. In terms of market contraction it is the pears that were the most affected in Belgium: the year before the boycott, pears accounted for 30.1% of the agro-food exports to Russia. Apples accounted for 5.6%. This resulted in a contraction of the Belgian market by 39.329%¹⁰ for pears and 11.055% for apples¹¹ (Table 1.1). This means the market contraction was almost four times bigger for pears than for apples. Moreover, given that the total value of pears exports was roughly 1.5 that of apple, this also means a bigger burden in searching for substitute markets for this former commodity.

Table 1.1: Exports of Apples and Pears inside and outside EU 28, in 2012-2013

	Total Belgian exports between January 2012 and December 2013 (in value, EUR)	Intra EU 28 (%)	Extra EU 28 (%)	Share of Trade with Russia in "extra EU 28" (%)
Pears	437 630 290	52,9	47,1	83,5
Apples	284 194 467	86,6	13,4	82,5

(Source: FOD Economie, 2016 - adapted)

To counteract the effects of this sanction, VBT started working on getting increased access to new markets, by putting pressure on the Flemish and EU governments to increase the speed of bilateral trade negotiations. VBT also lobbied to get financial support for growers that were deeply affected by the boycott. Temporary crisis prevention measures were introduced. In particular, it was allowed to withdraw from the market 85,650 tonnes of apples and pears from the Flemish production¹², in exchange of compensations. More explicitly, for each 100 kilogram of apple given for free, farmers received €16.98 from the EU. For other types of withdrawal, the compensation was €13.22 for members of a Producer Organisation¹³ and €6.61 otherwise. Of the 85,650 tonnes allowed, only 5.6% were actually withdrawn¹⁴ (Flemish government, 2016). According to the stakeholders, the crisis prevention measures were not sufficient to fully compensate losses. The producers who suffered the most from the crisis were those producing high quality apples because prices were reduced to nearly the same level whatever the category. Those producers that usually received higher prices for their production, incurred the highest price shrinkage that often did not cover their costs.

According to auctions data collected by VBT, between December 2013 and December 2014, the price of pears *Conférence* fell by 18.4% at the auction (from 0.49 EUR/kg to 0.40 EUR/kg) while the price of *Doyenné du Comice* diminished from 0.64 to 0.38 EUR/kg, a reduction of 39.9% (FOD Economie, 2015).

¹⁰ Which is calculated as 83.5% of 47.1%

¹¹ Which is calculated as 82.5% of 13.4%

¹² This was decided in the last round of support which started August 8th, 2015

¹³ Only 75% of the compensation was financed by the EU in this case (Department of Agriculture & Fisheries, 2015b)

¹⁴ in April 2016

In comparison with the year before, the price of the *Conferences* was in average 46.4% lower in 2014 and 29.3% for the *Doyenné du Comice*.

For apples, this reduction was even more pronounced. Between Decembers 2013 and 2014, the price of *Jonagold*, *Golden* and *Boskoop* fell sharply, by 42.9% (0.64 to 0.36 EUR/kg), 44% (0.54 to 0.30 EUR/kg) and 39.1% (0.50 to 0.30 EUR/kg) respectively. Note that the average costs to produce 1kg of *Jonagold* is estimated to 0.36 EUR. Compared to the average price received in 2013, *Jonagold* lost 20.6%, *Golden* were auctioned at a price 19.7% lower, while *Boskoop* prices were reduced by 46.6%.

Based on these data, it is difficult to conclude on the exact role played by the Russian Boycott in the level of the prices of apples and pears in 2014. However, one interesting remark is that, even though losing the Russian market was more detrimental to pears, both commodities seem to have incurred not so different price reductions.

In view of this, it is important note that the stakeholders do not perceive the current crisis in the apple sector as a direct result of the Russian boycott. According to them the boycott has only intensified the impact of the apple oversupply on the EU market, which already existed before the boycott. Moreover, they think that the actual apple trade with Russia had already decreased significantly before¹⁵. Yet, the crisis for apples was caused by the influx of Polish apples that were supposed to be exported towards Russia, but were instead sold on the EU market at low prices. Hence, the dramatic economic situation of growers in 2014 was caused by two combined effects of the Russian Boycott: a direct negative effect on the price of pears and an indirect effect on apples through the increase in the competition of domestic growers with Polish apple exporters. Indeed, while Polish producers were able to market their apples at the low resulting prices, Flemish growers incurred losses due to their higher production costs. Finally, the shift from apple to pear might have been caused by the pessimism of farmers regarding their ability to compete on the international apple market in the future, which was reinforced by their vulnerability towards Polish production following the Russian Boycott.

¹⁵ This is something we are not yet in a position to validate or invalidate.

3.2 Policy and regulatory conditions

We will begin with discussing the financial support in the apple and pear sector, which is in fact in its large share going through cooperatives. Secondly, we will describe the regulations that applies to inputs used in the production of apples pears that are pesticides, land and labour. Finally, the trade regulations will be shortly discussed.

3.2.1 Financial Supports

3.2.1.1 Support to the cooperatives

An important level of the *CAP* for the fruit and vegetable sector is the support to cooperatives. The main motivation to target those organisations is not only to incentivize growers to join a *Producer Organisation (PO)* but also to support common innovation processes and collective marketing. In other words, the *EU* subsidies collective action and pooled risk management. One of the expected impact of the reinforcement of such organisations is the increase in farmers' bargaining power in order to create a level playing field in the supply chain (Gijssels & Bussels, 2012). To do so, the main tools are supply concentration and market-based production through common auctions and sales. The existence and recognition of *PO*'s is crucial in these market measures because recognized *PO*'s can make up an operational program which outlines actions for the *PO* to work on in order to reach the goals set by the *EU*. The goals outlined in the operational program have to be in line with the *National Strategy*, which is published by the government and is a member state's interpretation of *EU* legislation. The fulfilment of the goals in the operational program can be subsidized by *EU* funds up to 50%, the rest being co-financed by the *PO*. The maximum amount of support is 4.1% of the total value of marketed produce, and up to 4.6% if an extra 0.5% is spent on crisis prevention or management. At least 10% of these funds have to be allocated to a minimum of two environmental actions (VBT, 2015). Then, one example of an action that is subsidized by a number of cooperatives, at the farm level, is hail insurance. In the 2013 *CAP* reform new market measures were introduced, including new crisis management tools, which can temporarily be used in the case of urgent problems (Platteau et al., 2014; Massot & Ragonnaud, 2016). An example of such an urgent crisis was the Russian boycott.

The majority of the growers we interviewed mentioned spontaneously that they benefit from hail insurance through the cooperative.

3.2.1.2 Support to farmers

All in all, the fruit sector has never received high levels of protection under the *CAP*. Indeed, the *Common Market Organization (CMO)* for fruit and vegetables is a light market organization and as a result, the sector never received high levels of pillar I subsidies. In the period 2007-2012, income payments received by fruit farms averaged about €1,626 per farm, or about 2% of farm income (Platteau et al., 2014; Department of Agriculture & Fisheries, 2016a). With the introduction of internal convergence, member states have to strive for a fair distribution of direct support subsidies over all arable hectares by 2019. It is estimated that the fruits sector will gain from this process. In direct payment subsidies, each fruit farm will receive an additional €1,909 by 2019, that is, a small increase in income by about 1%.

The fruit sector also receives rural development payments (pillar II), sometimes co-financed by the “*Vlaams Landbouwinvesteringsfonds*” (VLIF), which is the ‘*Flemish Investment Fund for Agriculture*’¹⁶. The application of the rural development scheme in Flanders is laid out in a ‘*Program document for rural development*’, also called *PDPO*. Every *PDPO* includes a number of commitments towards rural development, including agro-environmental measures (Platteau et al., 2014). The current *PDPO III* runs from 2014 until 2020. In *PDPO III*, 30% of the budget has to be spent on measures regarding climate and environment. The latter include agro-environmental measures, support for organic production, investment support for climate and environmental actions and compensation payments in *Natura 2000* areas (Department of Agriculture & Fisheries, 2015a; European Commission, 2015).

In practice, the *EU* provides a list of possible measures among which each member state can choose the most appropriate ones for its national context. The two most important categories are agro-environmental measures and investment support subsidies¹⁷.

It is worth mentioning that in *PDPO II*, mechanical weeding and planting of high stem trees were subsidized as agro-environmental measures. However, the latter subsidy is no longer available while mechanical weeding is still included in

Stakeholder: “The investment support measures co-financed by the VLIF are a valuable tool to help finance investments on the farm.”

PDPO III but with a subsidy of €260/ha on a minimum of 0.5 ha. Another change is that until 2007, there was support for integrated pome fruit production while from 2010 onwards pheromone usage became subsidized, and remains subsidized in the *PDPO III* for €210/ha on a minimum of 1 ha. It is also worth precising that each commitment has to be maintained for five years. Finally, the *PDPO* also includes subsidies for organic production, which are in fact not considered as an agro-environmental measure. For orchards being converted to organic production, the subsidy is €860/ha during the time of the conversion (2-3 years) while for already established organic farms it is €210/ha (European Commission, 2015).

In a nutshell, from data of the *Department of Agriculture & Fisheries* (2016a), it can be inferred that in the period 2007-2013, the rural development support made up 8% of the income in the fruit sector. This indicates rural development payments are more important to the fruit sector than direct payments, which comprised only 2% of the income.

3.2.2 Regulations affecting inputs and assets

3.2.2.1 Pesticides

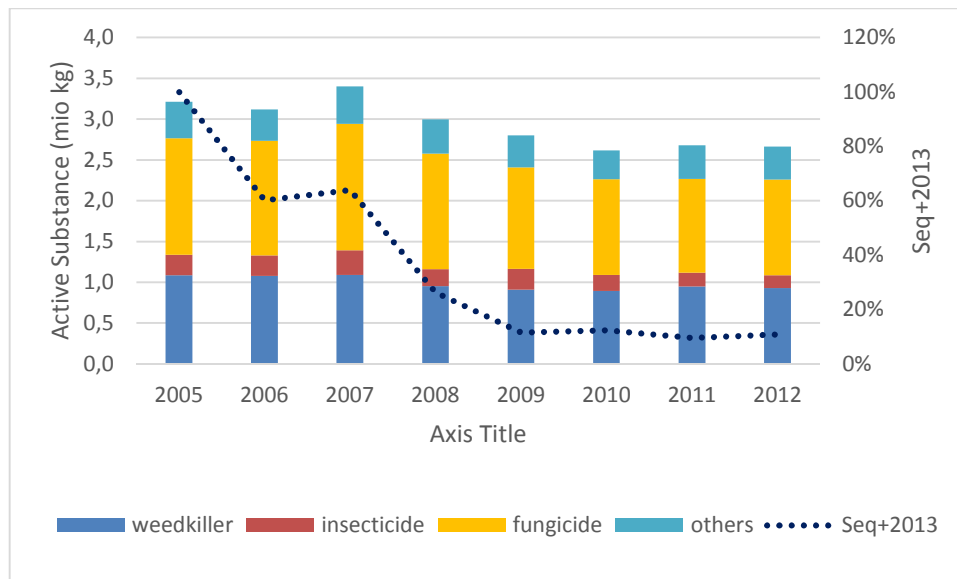
The fruit sector is one of the most pesticide-intensive sectors in Flanders. In 2012, the fruit sector accounted for 26% of the total active substance used in Flemish agriculture, which was the highest among all sectors, while it took up only 6% of the production value and 2.5% of the total agricultural land. This observation obviously questions the sustainability of current fruit productions. In addition, this sector had the highest seq-index, which is a measure for the pressure of the pesticide use on water life. The pesticide use on fruit farms over the period 2005-2012 has remained fairly stable, when measured in kilograms of active substance applied (Figure 3.5). However, the seq-index has dropped considerably which means the environmental pressure has gone down over the years. Because pesticides are such an important input for fruit production, regulations around pesticide use are likely

¹⁶ Throughout the rest of the document, this institution will be referred to as *VLIF*.

¹⁷ In Belgium, this last one is co-financed by the *VLIF*

to have an effect on farming performance, through changes in costs or availability (Demeyer et al., 2013; Department of Agriculture & Fisheries, 2016a, 2016b).

Figure 3.5: Pesticide use on fruit production farms



(Source: Department of Agriculture & Fisheries, 2016b)

3.2.2.2 Land Regulation

As mentioned *supra*, apple trees have a rotation period of about 14 years. This implies that land tenure security is a key component in the definition of apple producers' strategy. In Flanders, farmers' land tenure is protected by "leasing regulation", which covers about 75% of the agricultural land. The minimum term for leasing contracts is nine years, after which the landowner can cancel the contract unilaterally. After two periods of nine years, this cancellation can happen with intervals of three years. The former is the basic procedure, but there are variations in the actual applications. For example, there exists a "career contract" in which a farmer is guaranteed the land until he reaches the age of 65, and for a minimum of three periods of nine years (27 years) under the condition that the landowner can ask a price premium of 50% for land and 25% for buildings over the price for a traditional contract. The contracts can be overruled if the government decides to relocate the land to a different use (e.g. public housing), which could happen every three months, and for which the farmer will be fully compensated. The maximum rental price for the traditional contracts is calculated as the cadastral income of the land, multiplied by a coefficient determined by an official organisation that calculates these every three years for different areas in Flanders (KBC, 2005). These coefficients are available on the website of the Department of Agriculture & Fisheries. A negative side-effect of the regulation defining maximum rental prices is that it has led to the existence of a so-called grey market in which farmers pay a certain amount of the rent "off the books" (Ciaian et al., 2012).

3.2.2.3 Labour Legislation

The apple and pear sector has a high need for seasonal labour in the harvest season, starting around September-October. This third-party labour took up 21% of the total orchard production costs in 2013 (Figure 3.4), according to data from the *Department of Agriculture & Fisheries* (2016b). Consequently, the labour legislation is important for the competitiveness of farms in this sector. Flanders works with a minimum wage system for seasonal labour, depending on the sector. For seasonal work on fruit

farms, this wage was fixed at €8.55/h for an adult in 2015, which is much higher than their Polish competitors. Yet, seasonal labour is regulated by daily contracts, and the employer of seasonal workers has the advantage of a lower social insurance tax rate than the one prevailing in other sectors. Another benefit of the agricultural labour legislation is that the maximum number of hours that can be worked daily is 11h instead of 9h in other sectors (Boerenbond, 2014; FOD WASO, 2015).

3.2.3 Trade regulations

For fruits and vegetables imports into the *EU*, an *ad-valorem* customs tax is in place. It is expressed as a percentage of the customs value and varies over the year. For countries bound by a bilateral trade agreement, preferential tariffs can be used, sometimes for a fixed volume of product.

Many European fruits and vegetables, including apples and pears, are regulated by a so-called entry price system laid out in regulation (*EC*) No. 1234/2007 (EC, 2007). This regulation replaced the previous system based on import licenses to regulate the influx of apples into the *EU*. The entry price system is aimed at preventing low price imported fruits and vegetables from distorting *EU* prices. It consists of a daily fixed import tax based on the price prevailing on the member states' markets, for the competed product. At customs, the import value is compared to the minimum import value and if it is lower, an equivalent extra tariff is required. Determining these daily minimum import values is a complex process as they are calculated separately for different quality and size classes (Lambrechts, 2013). Note that tariffs not only affect product prices themselves, but also the cost of inputs, a.o. synthetic fertilizers.

3.3 Market conditions

3.3.1 Global market description

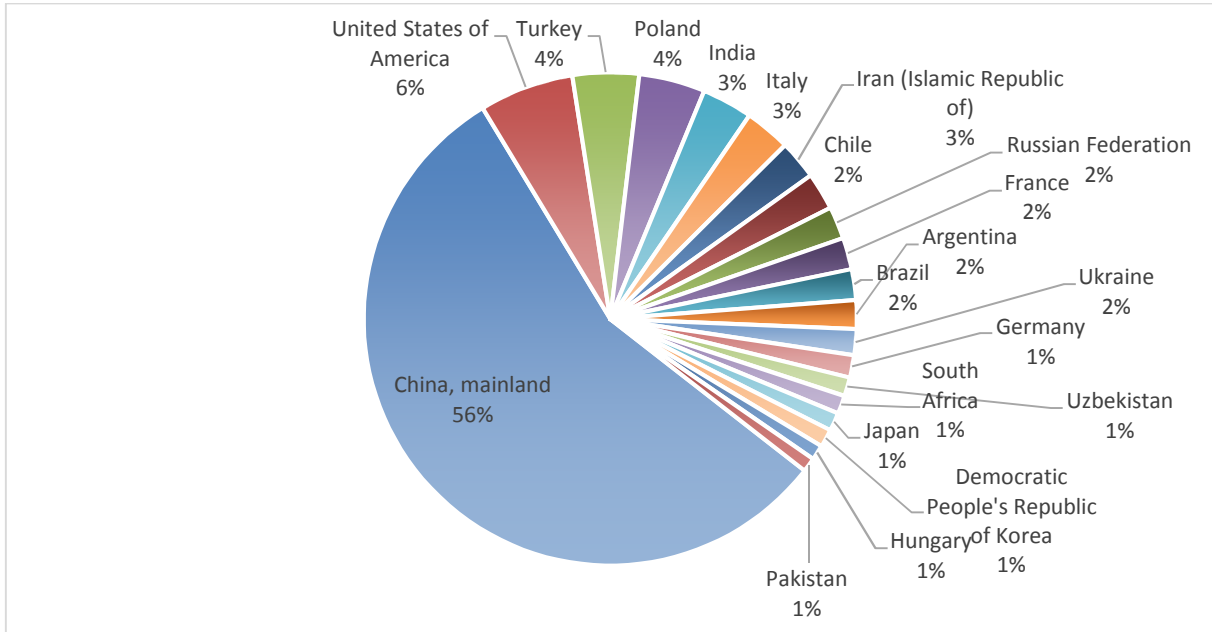
3.3.1.1 International Market

The main producers of both apples and pears in the world are China, the *US* and the *EU* (figures 1.6a and 1.6b), with the Chinese production having gone up steeply during the last two decades and conferring to this country a long lasting position of top leader. Within the *EU*, the largest producers are Poland, Italy and France for apples and Spain instead of the latter for pears. On the international market, Turkey, India, Argentina and Chile should not be underestimated neither given the importance of their production capacities for both commodities. Some emerging markets should also be considered out as they might become key players in the future. Moreover, it is worth adding that for apples, seasonality shapes partly the structure of the market and induces the creation of strategic alliances between suppliers in both hemispheres. For Belgium, and the *EU* in general, New Zealand plays the counter-seasonal role for this commodity. Finally, even though the Belgian production of apple and pears is rather similar in terms of value and production capacities, the rank of both products on the international market is very different. Indeed, while Belgium ranks 11th on the world production of pears in both value and quantity produced, it has never appeared among the most important apple producers in the world, which reflects a much stronger competition and a weaker Belgian position on

this market. In 2012, Belgium produced 10% of the European pear production while this share was only 1.9% regarding pears (Delombaerde and Lambrechts, 2014).

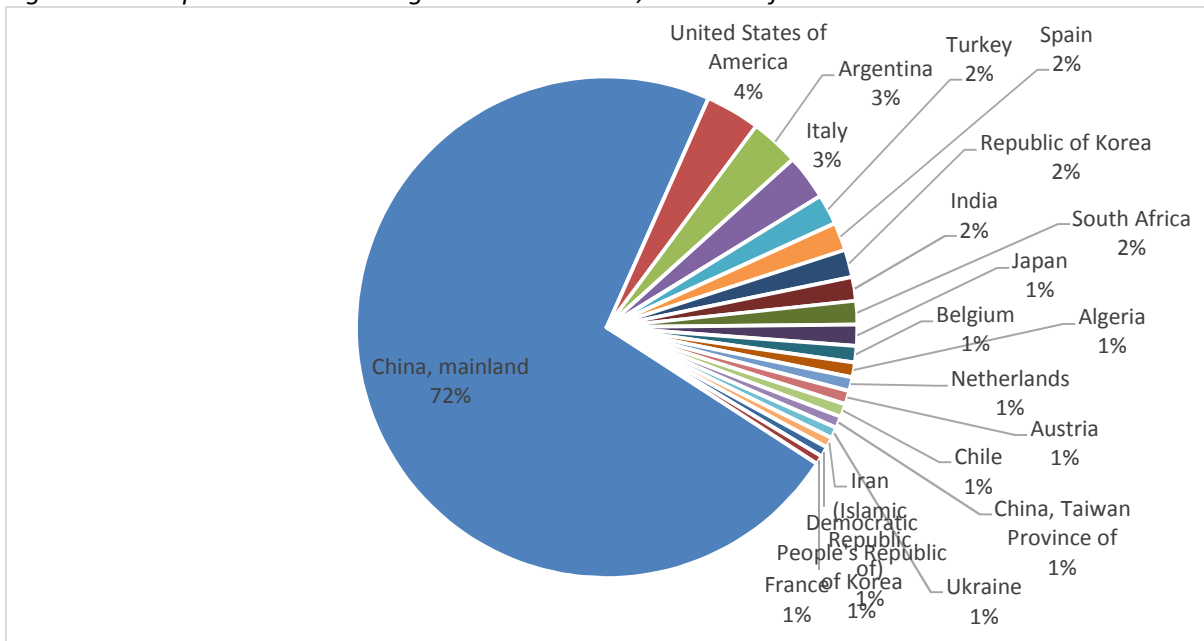
The most important trading partners for the fruit sector in Belgium are the neighbouring countries Germany, France and the Netherlands. For fruits, Russia used to be the most important non-EU export destination with 25% of the fruit exports in 2013, and even up to 40% for pears. This explains why the year 2014 was gloomy for Belgian apples and pears following the Russian import ban, which is still in place today (Vilt, 2014d; VBT, 2015). In combination with a high harvested volume compared to other years, this boycott led to a low price formation at the auctions in 2014.

Figure 3.6a: Top 20 Apple-Producing Countries in 2012, in terms of Volumes



(Source data: FAOSTAT; Graph: own construction)

Figure 3.6b: Top 20 Pear-Producing Countries in 2012, in terms of Volumes

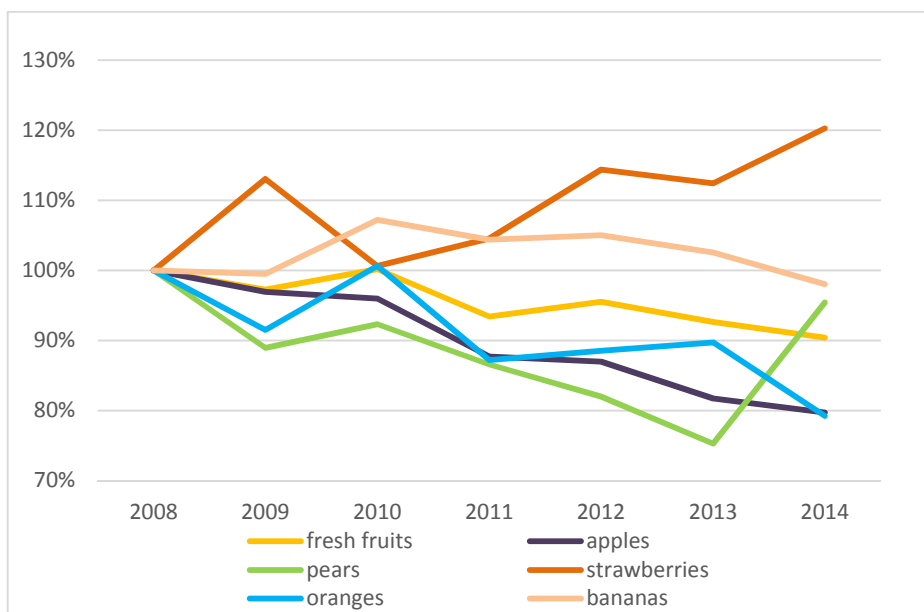


(Source data: FAOSTAT; Graph: own construction)

Interestingly, even though it benefits from huge production capacities and low costs, China is not the main direct competitor of apples for Belgium. Indeed, Chinese quality standards do not yet meet the international requirements (Lynch, 2010). On the contrary, Polish production is closer and very similar to the Belgian one in terms of quality while it does benefit from lower costs and higher quantity hence price influence in Northern EU. Moreover, the Russian boycott, by decreasing the opportunities of export markets, has reinforced the competition between both countries which tremendously harms the Belgian farms.

Yet, according to stakeholders, the explosion of Chinese production during the last decade and the lack of adaptation from other countries, created a structural oversupply of apples on the world market and a gradual decrease in prices. At the Belgian level, the change in consumer taste and the decrease in the demand was also responsible for the slow decrease in price. Figure 3.7 displays the trends associated to the consumption of fruits in Belgium: apples and pears seem to lose consumers' preference, even though the reduced price for pears in 2014 because of the Russian Boycott, had a positive effect on the Belgian consumption. All in all, those facts are summarized in the trends characterizing both imports and exports: a slow but gradually more accentuated decrease since the beginning of the 21st century (figure 3.8).

Figure 3.7: Trends associated to fruit consumption in 2008-2014 in Belgium (index: 2008)

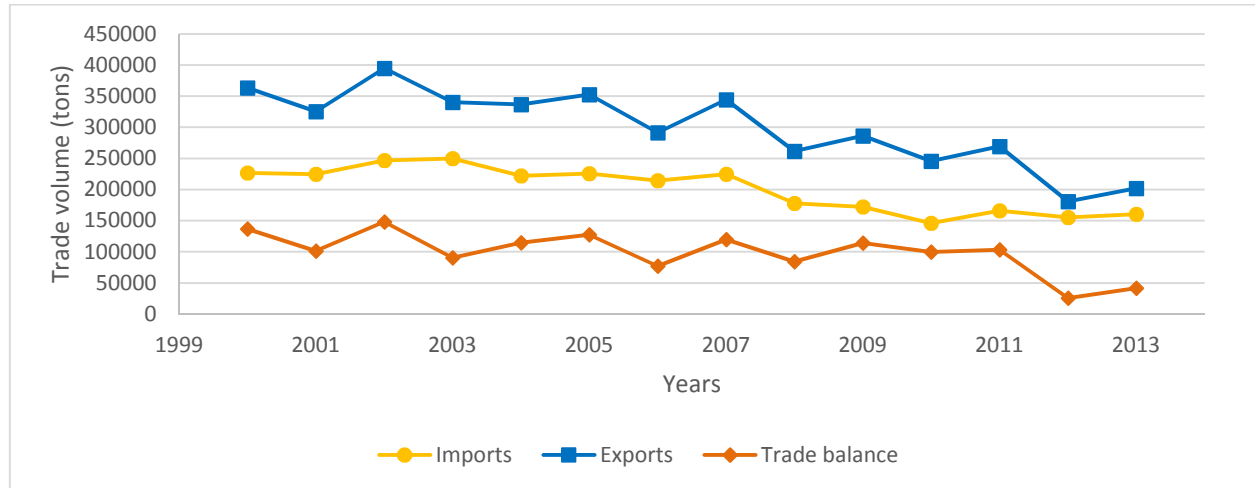


(Source: AMS, 2014 - adapted)

Overall, the interviewed stakeholders think the apple exports from Belgium will not be very important in the future. The reason is that most new apple varieties are less suitable for the Belgian climate in comparison to, for example, the Southern European climate. Moreover *Jonagold* is not very popular in most export destinations. Some stakeholders note that to have a successful export industry, we should produce apples according to the needs of the importing country, instead of 'forcing' the traditional varieties like *Jonagold* on other countries. However, the introduction of new varieties is expensive and risky. Yet one interesting successful example in this respect is the Indian case, to which the *Belgian Fruit Auction*, among others, started exporting in 2009, when the phytosanitary procedures were introduced. One of the varieties that is shipped there is called *Joly Red*, which is a sweet tasting, red club variety that the Indian people like (Vilt, 2016b). In general for exports, quality is pointed to be one

of the most important factor. In this regard, one of the advantages of exports towards Russia was the low quality requirement, which also meant in lower packing and sorting costs. Finally, transportation costs are also a key issue and are especially high for overseas exports, which means these apples need to be sold at high prices. Hence this is only possible for high quality apples.

Figure 3.8: Imports and Exports of Apples in Belgium



(Source data: FAOSTAT; Graph: own construction)

3.3.1.2 National Demand

Both apples and pears are characterised by an overall decreasing trend in national consumption (Figure 3.7). However, the consumption of both commodities has suffered differently from the Russian Boycott. Indeed, according to data of the *Department of Agriculture & Fisheries* (2016b), the annual consumption of apples per capita decreases in Belgium: it used to be 12.48 kg in 2008 and was reduced to 9.95 kg in 2014. In the same vein, the volume of apples sold in Belgium in 2014 was 3.7% lower than the level of 2013, while the value of the sold apples was 13.5% lower (VLAM¹⁸, 2015). This reduction in value is partly due to the low prices in 2014. However, pears have benefitted from a promotional campaign by the VLAM to increase their consumption following the Russian boycott. This has led to an increase of 29% in the volume of pears sold per capita between 2013 and 2014. This effect is also clearly reflected by the upward bounce at the end of the green line, associated to pear consumption, in Figure 3.7.

The most popular apple variety remains *Jonagold* that accounted for 43% of the volume sold in 2014 and 34% of its value. However, the consumption of traditional varieties is partly being replaced with new, small scale but more innovative varieties (VLAM, 2015). Among them, *Pink Lady* takes a non-negligible share of the market and benefit from the preference of a gradually increasing share of consumers. However, this variety cannot be grown in Belgium due to unsuitable climatic conditions and is thus imported from one of the three countries where it is produced: France, Spain and Italy. If this trend towards imported

According to the stakeholders we interviewed, the domestic market should become the main focus of apple producers, since competing on the EU market has become increasingly difficult. Quality is often noted as the key to remaining competitive in Belgium, in order to maximize the amount of top-quality apples that can be marketed at a reasonable price. This requires excellent orchard management and postharvest

¹⁸ VLAM stands for *Vlaams Centrum voor Agro- en Visserijmarketing* which is the “Flemish Center for Agricultural and Fisheries Marketing”.

varieties accentuates, it might harm the competitiveness of domestic farmers. To counteract this threat, local cultivars as *Kanzi*, *Braeburn*, and *Belgica* are being promoted. To do so, the *CMO fruit and vegetables* includes subsidies provided to the *VLAM* for the promotion of domestic fruit consumption. The program aimed to stimulate pear consumption after the Russian boycott was in fact based on those subsidies (Platteau et al., 2014; VBT, 2015).

3.3.2 Public and private standards applying to apples and pears marketing

We will first discuss the general EU marketing standards for apples and pears. Next, we will discuss the sector guide for auto-control, which is the guidelines farmers use to abide by most of the public standard requirements on the EU and national levels, and the integrated pest management scheme. Finally, we will also discuss the private quality standards required by the retail chain and the auctions.

3.3.2.1 Public standards

EU marketing standards for apples

In order to ease the free trade of agricultural goods within the EU common market, the European Commission has outlined marketing standards for fruits and vegetables. These are the minimum requirements a product has to meet in order to be tradable inside the EU. For fresh apples, so-called “specific marketing standards” apply. By way of examples, those requirements includes the fact that apples and pears are “practically free from pests” and are “not damaged”. There exists also requirements linked to firmness and taste and the marketing standards include the quality classification of apples. Apples must be categorised according to three major classes: the *Extra Class*, *Class I* and *Class II*, which are based on colour, shape and the absence of damage. The *Extra class* includes only top quality apples with excellent colour and shape attributes. Furthermore, there exists standards for packaging that mainly meet the needs for a number of traceability specifications. All the requirements and rules are outlined in *Regulation (EC) No 543/2011* (EC, 2011).

Information from interviews with farmers: One grower who sorted part of his fruits at the farm argued that the largest cost for sorting is not the machinery itself, but the personnel that is needed for the process, which again shows the importance of labor costs. Another respondent indicated that he used to sort fruit at the farm-level, but had decided to transfer this activity to the auction because of the increasing sorting and packaging requirements of retail chains.

These requirements bring about operational costs for the farmer if the apples are sorted and packed on the farm, since fast and correct sorting by colour and size requires sophisticated machinery. This partly explains why packing and sorting operations are transferred to the cooperatives.

The sector guide for auto-control for primary plant production

The sector guides for auto-control lay out management practices required to respect the public standards set out by the *FASFC*¹⁹ with respect to food safety and traceability. The guides came into existence after a Royal Decree in 2003, which was stimulated by the EU regulation *(EC) No 178/2002* regarding traceability, among others (EC, 2002; Demeyer *et al.*, 2013). Specifically for fruits, an important section of the sector guide is the one on storage requirements for pesticides, which indicates that crop protection products have to be stored in a separate and sealable room without

¹⁹ National agency for the safety of food supply chain

danger for explosion or direct contact between different chemicals. Also, the requirement of a phytolicense and a license for the appliance machinery which has to be granted every three years is laid out. The guide further indicates that only products allowed under the Belgian law can be used and must respect the specified MRLs (Vegaplan, 2015a). Concretely, the aim of this guide is to provide a practical summary of the regulatory framework the farmer has to respect. Important to note is that a certificate for this guide only indicates that a farmer is in compliance with the *FASFC*, and this does not mean that the requirements of e.g. the retail chain have been fulfilled. In other words, it does not mean that the farmer will have a market for the products.

Integrated pest management for apples and pears

The IPM standard is not mandatory, but has a legal basis for apple and pear production since 1996 and can thus be seen as a public standard. The standard outlines the requirements for integrated fruit production. Shortly, IPM aims at reducing the use of chemical crop protection agents by combining physical and biological protection mechanisms like the use of natural enemies of common pests. Moreover products to fight pest must be chosen within a list of products outlined by the government. The control of the standard is done by *Tüv Nord Integra*, among other certified agencies. There is also a new private standard regarding IPM, which was introduced by *Fruitnet* in 1991 and sets higher requirements than the former ones (Tüv Nord, 2014). Note that since January 1st 2014, a number of IPM measures have become mandatory in the EU. These are outlined in the EU directive 2009/128/EC (EC, 2009a), and have also been included in the sector guide for auto-control. Examples of such a measure are the monitoring of pest to reach a targeted protection level and the use of non-chemical crop protection measures to alleviate environmental pressure.

The stakeholders that were interviewed mainly view the IPM standard as a tool to remain up to date with the environmental regulations, especially with respect to MRLs. The IPM standard was also noted as a way to lower the number of pesticide applications on the farm, which could reduce the production cost.

3.3.2.2 Private labels in the Flemish fruit sector

GlobalG.A.P. is probably the most well-known international private standard. It is also the most recognized standard in the retail and distribution sector since it is done so in more than 100 countries, which obviously facilitates trade on this large market.

Another private label that is relevant to the Flemish fruit sector is *Vegaplan*. This standard originates from the former "*IKKB standard*". Its creation is said to be based on collaboration and consultation with all types of stakeholders along the supply chain, from farmers to retailers. The standard incorporates all legal requirements of integrated pest management and also fully integrates the sector guide for auto-control. However, the standard goes further than the ones previously discussed and additionally incorporates requirements imposed by the auction and the retail sector. This ensures market access of products that get certified by this standard. Moreover, it incorporates cross-compliance measures that are necessary to obtain direct payments under the *CAP*. Hence the aim of *Vegaplan* is to combine all these aspects into one standard for simplification. Finally, the *Vegaplan* certificate is exchangeable with the German '*Qualität und Sicherheit*' standard so that is also gives access to the German market (Vegaplan, 2015b).

The former standards are often merged with quality labels introduced by *POs*, like "*Truval*" and "*Haspengoud*" in the Belgian Fruit Auction and *Auction Haspengouw*, respectively. These labels are meant for the top quality fruits with respect to size and colouring. More recently, a label called *Responsibly Fresh* was developed by the Belgian union of horticultural producers (8 feb 2012).

This label guarantees that the production process follows sustainable practices. It reflects not only that this sector was a pioneer regarding sustainable productive chain but also that cooperatives are gradually more involved in the development of quality standards²⁰. In order to receive Responsibly Fresh certification, *POs* have to meet three conditions: the growers have to be certified in *GlobalG.A.P.* or *Vegaplan*, the cooperative has to sign an agreement on “sustainable conduct” defined in an action plan stimulating sustainable production, and finally the cooperative has to write a list of sustainability targets.

Finally, there are additional standards imposed by the food industry and retailers as “*Hazard Analysis Critical Control Points*” and “*British Retail*

The stakeholder interviews revealed one important way in which private demands of the supermarkets seem to be contrary to sustainability criteria. The stakeholders noted that supermarkets often lay out MRLs which are lower than those specified in the GLOBALG.A.P. standard, while there seems to be no scientific justification to do this. Further, supermarkets lay out a maximum number of MRLs that can be detected on the produce, which is opposed to the requirements of good agricultural practice that say a farmer needs to alternate active substances, which could result in a higher number of residues. The rule of a maximum number of residues laid out by supermarkets, in contrast, stimulates the use of only a few broadly active products which can result in resistance problems in the target species. This is also relevant for export markets like Germany, where every retailer has its own MRL requirements. The cooperatives provide guidance on how to respect the public and private standards, and on how to make up pesticide application schemes to stay below the MRL requirements of important export destinations.

Consortium”. According to Demeyer *et al.* (2013), the demands put on growers by these standards are often not scientifically justified and can even have negative effects on sustainability. The growers incur costs to apply the specified measures while the financial return is often limited. They are, however necessary to market the products. The reason why the requirements set by private standards might not be scientifically justified is that the *WTO* has no control over them, and can thus also not judge whether or not they are trade-distorting and should be removed (Hobbs, 2010).

3.3.2 Clubs and Marketing innovations: research, labels and certification

Flanders has two high level institutes that specialize in extension services for fruit production: *PCFruit*, co-funded by the fruit auctions, and the *Flanders’ Centre for Postharvest Technology*, which is a collaboration between *VBT* and *KU Leuven*. *PCfruit* assists growers in the application of IPM procedures and new technologies, the compliance with new public and private standards and the forecasting of weather conditions. The *Centre for Postharvest Technology* mainly do research about postharvest technologies to help producers in their harvest and storage decisions. The information and technologies provided by these institutes are also disseminated via the cooperative. In addition to those institutions, Flanders has two universities with agricultural departments: the university of Gent and *KU Leuven*. Finally there are also some interesting public-private relationships that stimulate innovation, like the company *Better3Fruit*, which is active in research for new varieties and works together with the *Center for Fruit Production* of *KU Leuven*. In conclusion, there is a lot of agricultural knowledge and research concentrated in Flanders which are rather easily disseminated to growers.

As already mentioned supra, the most common innovation in the fruit sector is the introduction of new varieties (Deuninck *et al.*, 2007b). Usually the strategy relies on a control of the supply of the seeds

²⁰ The Belgian Fruit Auction and Auction Borgloon are already members of Responsibly Fresh while Auction Haspengouw applied for membership in 2014 (VBT, 2015).

in order to maintain prices at a relatively high level. However, developing the demand for these new varieties is usually a slow process where advertisement plays a big role. The latter induces high costs that must be covered by a high enough price. Hence evaluating consumer's price elasticity to the introduction of these new varieties is key to the success of such strategies. In order to protect those new markets, the association of fruits and vegetables auctions, *Lava*, has introduced the *Flandria* label, used in the promotion of high quality, fresh fruits and vegetables that are grown in an environmentally conscious way (Gijssels and Bussels, 2012).

3.3.4. Relationship with retailers: a contested market power

Mainly, farmers sell their products through two different types of supply chain. In the first one, the apples are first cultivated in commercial apple farms in Flanders, based on integrated fruit production methods. Afterwards they are transported to a cooperative auction where they are sorted, stored, packed and sold. A big retailer buys the apples and transports them to its supermarkets in Flanders. In the second type of supply chain, the local chain, on the other hand, the apples are being cultivated on a small scale organic farm and sold directly to a group of consumers through seasonal fruit and vegetable baskets (Annaert et al, 2014).

The stakeholders we interviewed were of the opinion that the margins that supermarkets take when they sell fruits, or the price-wedge between the auction and retail prices, are very high compared to the risk the retail sector incurs. Moreover, they note that the producer price is often not sufficiently high to cover the production costs. Hence, according to them, the production risk is entirely at the grower side, while the margin is concentrated at the retail side. We suggested the possibility of more vertical integration in the supply chain as a solution to this problem, for example in the form of contracts with an insurance on the price level the growers receive. Most stakeholders, however, are not enthusiastic about this idea. They showed a lack of trust towards long-term vertical relationships with supermarkets, and fear that retailers will use producer's vulnerability and risk exposure to create strong competition between them. The long rotation period of apples and pears is also problematic in this respect, since contracts are usually made up on a yearly basis and will not cover the entire production period of the trees, which would still result in a significant risk for the growers.

« Since 2000, food prices went up by 28% for the consumer while they increased by 19% only for agricultural production prices. Between mid-2013 and mid-2014, the agricultural production price index plunged again below the consumer price index (2010 year reference). It has been the same trend for 30 years, but the agricultural price index experiences very high fluctuations from one year to another. » (Belgian Ministry of Statistics, 2016)

However, more and more farmers step aside from cooperatives and sign direct individual contracts with retailers. Farmers resorting to this type of contract are not yet numerous and are mainly producers of high quality fruits. The incentives for those farmers to do so lie mainly in some disfunctioning of the cooperative and the higher price received for such type of contracts. Indeed, while membership to cooperative is rather expensive and its role and efficiency gradually criticised, supermarkets offer the producer higher prices so that he can win up to 50% of the saved membership fee. Moreover, according to stakeholders, selling in this way to supermarkets is still more interesting than exporting apples, as prices are rather low and unpredictable on international markets. Some growers also have opportunistic strategies as they do not sign any contract with retailers but rather wait for high prices to sell their stored volume at once, usually through online platforms. According to the bank sector, this strategy is gradually more applied with the development of online opportunities.

However, this is a very risky strategy and not necessarily a profitable one due to the difficulty for many farmers to assess their actual unitary cost.

3.4 Key conditions identified in literature, media and interviews

3.4.1 Main conditions

1) Distorted competition: national regulation within a globalized market

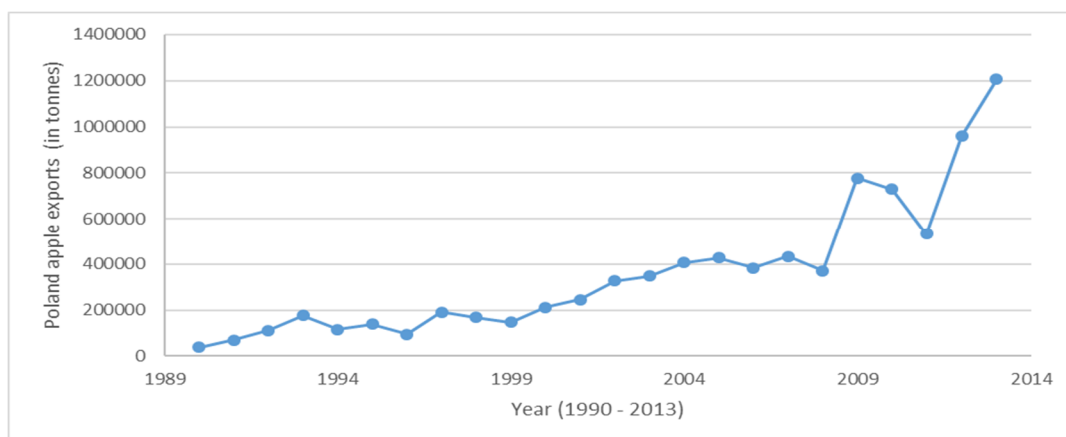
For many years, the apples and pears sectors have been characterized by an **oversupply**, resulting in stagnating or even decreasing prices because of the combined effects of an eventual **decreasing demand** and an **inelastic supply**. The difficulty for farmers to adapt their production to the new market conditions is due to the long rotation period of their orchard, and for some of them, to the well-known mental models which are proven to be particularly difficult to change.

As made clear in figure 3.9, Polish exports of apples went up sharply during the last three decades, and even more remarkably during the last five years. This trend is mainly explained by the investment in orchard and storage facilities boosted by the EU subsidies. Belgian farmers are particularly affected because they have relatively **higher labour and land costs** compared to Polish farmers, while they produce **similar varieties of apples**.

Farmers complain that this **competition is unfair** because prices are freely set on the EU market but subsidies and regulations are mainly fixed at the national level and differ between countries. Hence Belgian producers, because they are price-takers, are very vulnerable to weather conditions in other countries and exchange rate fluctuations. All in all, because they are the victims of unpredictable events they have no control on, it is difficult for them to foresee the optimal production choices.

That's why, some farmers suggested that in the future, they would rather not put all their eggs in the same basket. Specialisation and economies of scale seem not to be riding high anymore.

Figure 3.9: Evolution of Poland's apple exports over the period 1990-2013



(Source: FAOSTAT)

2) Market power of retailers and shacking producers cooperatives

Retailers have **market power**: this is gradually more the case and this assessment applies to many sectors. The main reason for this alarming observation lies in the reduction of the number of retailers.

Moreover, in the apple and pear sectors, producer are tied by **high adjustment costs** because of the long rotation period of trees which affect negatively their bargaining power.

Moreover, in recent years, the number of apple producers has decreased drastically. As in most agricultural sectors, farmers are encountering difficulties to stay profitable and competitive on the national and international markets (Annaert et al, 2014). They demand a stable and high enough price, in order to cover their marginal cost, and a **fair distribution of margins**. Flemish farmers in global chains have the perception that this is not always the case (Annaert et al., 2014).

The joined collaboration of farmers into cooperatives used to be a good tool to deal with retailers and to get the fair share of the pie. However, **more and more farmers are stepping aside from cooperative**.

This is mainly due to criticism toward cooperative management teams, which ask for big membership fees while their actions is not necessarily visible. Indeed, cooperative leaders have been heavily criticized for their unconsidered big investments in useless or oversized machinery. Moreover, some farmers are approached directly from retailers in order to sign **one-to-one**

Farmer:

"I signed a contract with [big retailer] because this was more lucrative for me. They give me a good price and on top of it, offered me half of the cooperative membership fee I would have to pay to the cooperative if I was still a member".

direct contracts. The incentive of retailers to do so is that they can require to get the best quality only. In exchange, they provide the farmer with a higher price than the one gotten through the cooperative. This is mainly made feasible because transaction costs are reduced by the membership fee of the cooperative. The conditions making this break occurring are the **oversupply on the Belgian market** and the high heterogeneity between farmers, within the apple and pear sector, in term of quality and size. **Big farmers can bear alone the investments** into storing capacities and sorting machines. In a nutshell, the gradually increasing heterogeneity of farmers seems to put at stake the survival of producers' cooperatives.

3) Level of debt of growers and liquidity constrain

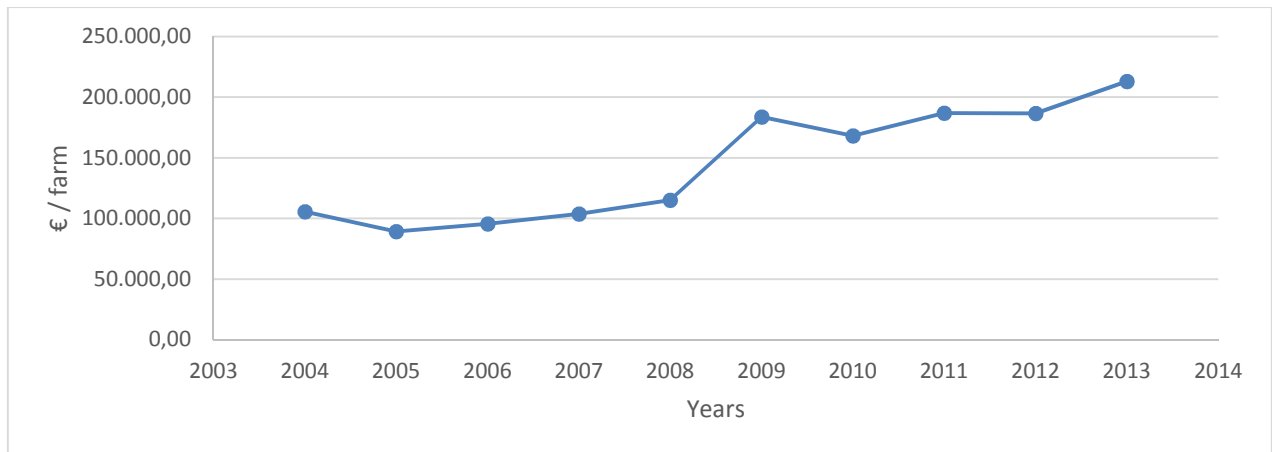
The growers we interviewed unanimously agreed that in the fruit sector, as in most agricultural sectors, the life cycle is shaped by years with low income that are compensated by other years with high income. However, the interviewed stakeholders noted that during the last years it has become **increasingly difficult to remain profitable** since the apple prices have been systematically low. Before 2014, this was partly compensated by the production of pears but since the Russian boycott, pear production is also in crisis. As a result, farms have to **eat gradually more on their accumulated capital** to bridge this period.

Furthermore, the growers observe a **credit contraction** since the financial crisis. Apparently, the banks place increasingly more importance in well-constructed business plans and the financial situation on the farm. Figure 3.10 shows the evolution of total liabilities on fruit orchards for Flanders (from FADN data). We see that the liabilities have increased since 2005, with a peak in the period of the financial crisis. This might be one of the reasons why banks are more critical when considering to give out loans. One grower noted that because of the difficulty to obtain loans, it might become harder in the future to do investments which are needed due to the increasing regulations, a.o. environmental regulations. It is likely that this difficulty to obtain loans will **impact the capacity to renew and to reshape orchard stock** as these require significant capital investment.

However, it might also be that farmers are in fact adopting too **risky strategies**. The representative of the bank sector that we interviewed suggested that farmers are richer than what they pretend to be,

especially because they usually evaluate their wealth status based on liquidity only. In particular, farmers have **huge assets** that they are often reluctant to sell. Their usual strategy is grounded in **land accumulation and economies of scale**. The main issue is that often the new land acquisition is not self-financed. Hence, this strategy translates in high requirement of liquidity in order to buy huge amount of inputs and pay high debt services. In a nutshell, because farmers have a **reduced financial buffer** and are not always afraid of debts accumulation, they might have to cope with risky situation in which their main issue will be the **liquidity constrain**.

Figure 3.10: Total liabilities on Flemish orchards (indexed based on 2005)



(Source data: FADN; Graph: own construction)

3.4.2 SWOT analysis

Table 1.2 : SWOT Analysis on the Apple/Pear sector in Belgium

<p>Strengths</p> <ul style="list-style-type: none"> • Institutional organisation • Localisation : centrality of Belgium and proximity of growers • Collaboration with high level national Research and Development Institutes 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Reduced importance of farmers' cooperatives and tensions (big investment in costly, and maybe not appropriate, sorting machines) • Gradually less diversified production • Long rotation period of trees • Lack of differentiation with country neighbours • Lack of diversification at the farm level • Farmers level of indebtedness
<p>Opportunities</p> <ul style="list-style-type: none"> • Innovation through club systems • Government support in having a sustainable national demand • Increasingly higher demand from South countries • Revival in civil society interest for local production, short-supply chains and diversified commodities • Russian Boycott • Vertical coordination with retailers • Pesticide regulation 	<p>Threats</p> <ul style="list-style-type: none"> • Lack of access to land • Climate change : unpredictable and very harmful negative events • Oversupply at national and international level • Improved quality of supply from Poland and other countries • High Labour costs • Russian Boycott • Vertical coordination with retailers • Pesticide regulation

Given that the SWOT analysis is deduced from the long narrative done in this document, each cell is rather intuitive and we will only described shortly what the table contains.

As strengths, three characteristics of the Belgian sector are considered. First, we recognize as a strength, the well-structured institutional organisation, mainly based on the existence of cooperatives. Second, the centrality of Belgium and the concentration of growers in a small region is an internal conditions helping farmers to sell their products. Finally, the long-lasting collaboration with high-level national Research and Development Institutes is a non-negligible advantage to the development of new varieties.

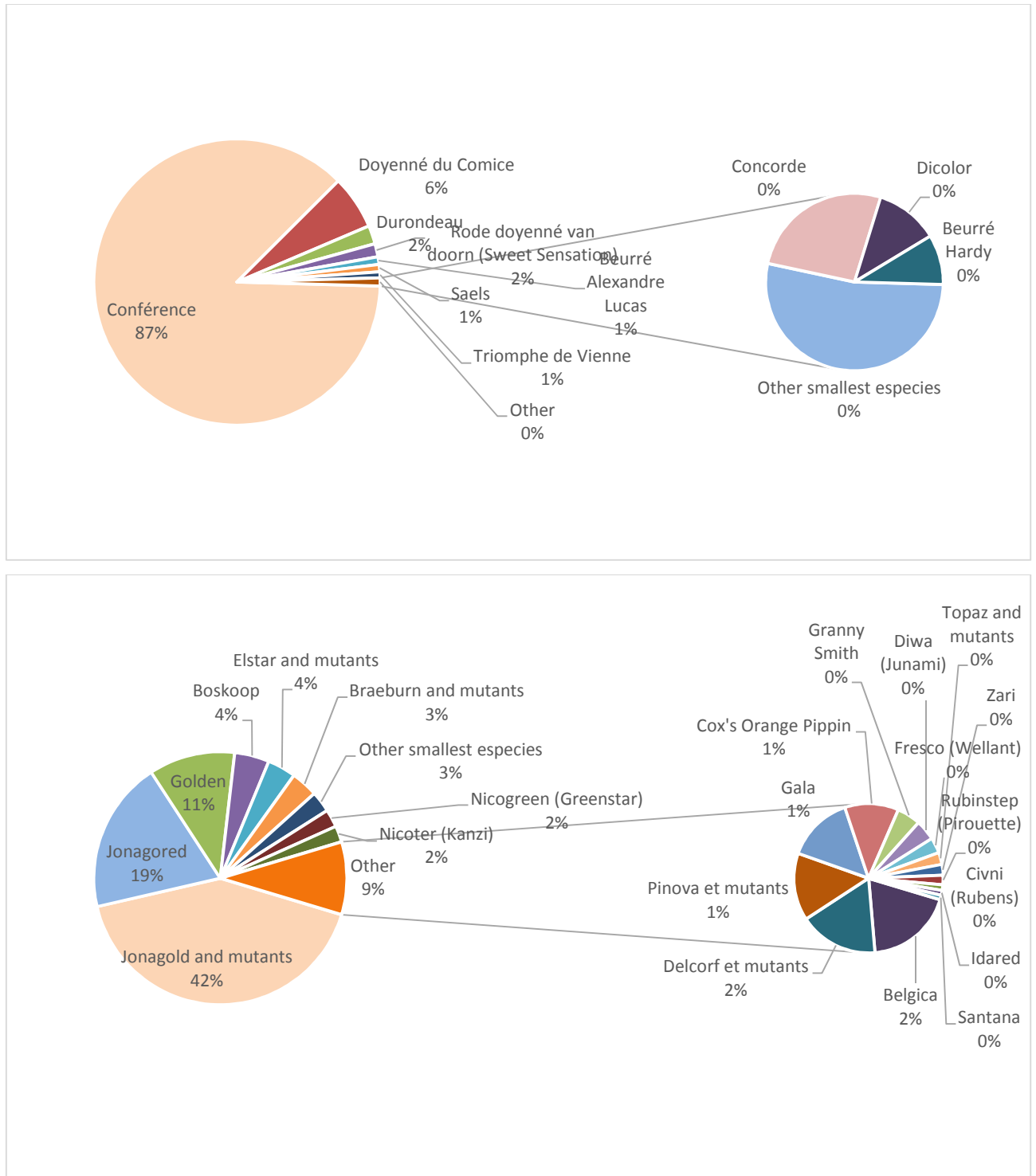
As a matter of facts, the list of weaknesses is longer than the one of strengths. The 6 internal conditions mentioned speak for themselves.

Then, seven opportunities are listed while the list of threats contains 8 external conditions. Here, the three last items that are common to both columns are worth being commented. First, the Russian boycott might be perceived as a threat because it obviously contracted the internal market. However, as stakeholders suggested, it might be that this event only revealed some market dysfunction that already prevailed before, and hence can be seized by farmers and policy makers as an opportunity to cure already long-lasting problems. Second, the vertical coordination with retailer is an opportunity for farmers to sign long-term contract and get a better price, yet to the extent that there is no hold-up by powerful retailers. Third, pesticide regulation can be considered as both, an opportunity and a threat. Indeed, pesticide regulation are difficult and costly to meet. However, these regulations are mainly at the European level and Belgium is doing quite good in meeting the requirements in term of

number and level of pesticide residues, compared to other European countries (say Poland and Italy). Hence, this advantage might reinforced Belgian competitiveness at the European level, yet meeting them is costly and thus might be a threat to the survival of the sector.

Appendix case study A

Figure 3.11: Share of trees per main cultivars of Apple (a) and Pear (b) produced in Belgium in 2012



(Source data: statbel 2016; Graph: own construction; threshold fixed at 2% of total apple/pear trees).

4 Belgian Case Study B : Sugar Beets

4.1 Introduction

4.1.1 Case study introduction

Before the start of the 18th century, sugar was only derived from sugar canes cultivated in South America, Africa and other parts across the globe. In the middle of the 18th century, sugar beet²¹ (*Beta vulgaris L.*) was discovered in Europe. The discovery occurred when it was realized that local beets grown as animal feeds contained sugar. After careful and successful selection of beets with high sugar contents from various fodder beet species, the world's first beet sugar factory was established in Silesia in 1801 (CIBE, 2003). Beet growing and processing gradually became popular throughout Europe and it is presently, grown in over 140 countries in the world including 19 European Union (EU) member states.

In this section of the national report, we look at the regulatory and marketing conditions of sugar beet in Belgium. Our main objective is to highlight the conditions and factors influencing the production and marketing of beet by producers in Belgium. We review both external and internal conditions in the beet supply chain. However, since SUFISA is primary producer-oriented, we mostly emphasize beet growers in the beet sugar supply chain.

4.1.2 Socio-economic importance of sugar beet

Beets take between 150 to 250 days to complete their growing cycle and they are popular rotational crops in Western Europe. They are grown on the same field every three to five years by most farmers and are rarely grown as a continuous monoculture (CIBE, 2003).

Currently, sugar beet is a profitable crop with a wide range of industrial applications. Beets also serve as a valuable break crop in the mainly cereal-based crop rotations, returning organic matter to the soil and preventing the build-up of diseases. When it is rotated among cereals, beet contributes to soil structure due to the deep root penetration into the soil. The roots fibers, beet tops and leaves left on field after harvesting add organic matter to the topsoil, which improves the soil living organisms. The beet plant hardly harbors pests and diseases that affect other combinable crops in crop rotation and it is also an efficient user of plant macronutrients and water (Rüdelshiem & Smets, 2012). This gives beet an important role in integrated pests' management and in crop rotational cycles.

Although beet was originally discovered for sugar production, the crop has many other industrial uses. Currently, across Europe, beet contributes to around 18 million tons of sugar for food consumption, 1.6 million tons of sugar syrup for ethanol production, 0.8 million tons of sugar syrup for the chemical industry. In terms of energy production, nearly 20-40.000 hectares of sugar beet are converted annually into biogas for heat and electricity while in the livestock sector, close to 5 million tons of beet pulp are used for feed production (CIBE, 2015). Beet has therefore become important in many other

²¹ There are different types of beet but for the sake of brevity we refer to sugar beets simply as beet throughout this report.

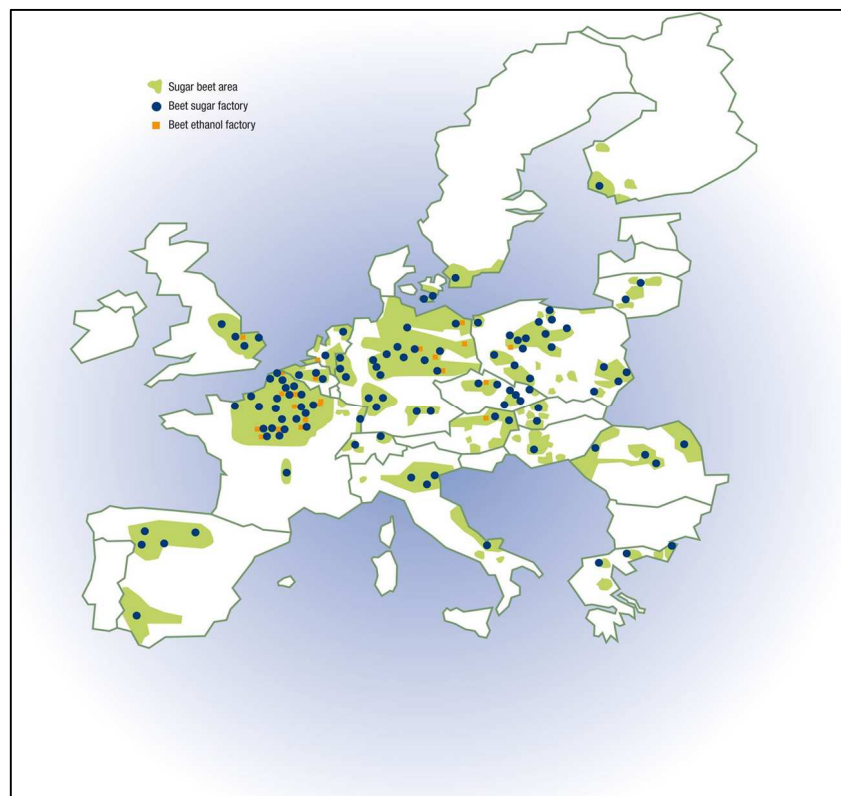
sectors apart from the food sector. However, the primary uses in Belgium and the rest of Europe, is sugar production.

The beet sugar sector remains one of the strategic sectors in the EU due to the important role of sugar in the manufacturing of other food commodities. Sugar's role as the primary sweetener for various foods and drinks makes beets important in ensuring in food security as well.

4.1.3 Beet production across Europe

The EU 28 is the world's leading producer of beet with around 50% of global production and total harvested area of 1.548.757 hectares. There are nearly 141.178 farmers involved in beet growing in the in EU-28 (CEFS, 2015). Sugar from beets accounts for nearly 20% of the total world's sugar production. The rest of the global sugar production depends on sugar cane cultivation (EC, 2016).

Figure 4.1 Area of beet production with processing plants



(Source: CIBE, 2015)

The figure below shows the most favorable areas of beet production in the EU-28 as well as the location of processing factories. It can be seen that the most densely industrialized production areas are (northern) France, Germany, the United Kingdom and Poland (Eurostat). In 2014, more than half of the EU-28 sugar beet production came from these countries. They are, however, not the only areas of beet production as nearly all member states produce beet on different scales and intensity.

Due to the differences in the ecology, soil types, climatic conditions and cultivation practices such as input uses between countries, there are large production differences among member states. The world sugar statistics shows that there was a deficit of 6.7 million tons in 2015 according to the International Sugar Organization (ISO). This poses a threat to food security since sugar is one of the most common

ingredients in most human and animal foods. There is therefore the need to sustain if not increase production of beet in order to meet global demand for sugar.

With 20% of global sugar coming from beet, the majority coming from the EU, there is the need to dissect the sector based on conditions affecting primary producers in order to build a more resilient and sustainable sugar beet sector in the EU. This has become even more necessary among the EU member states, since the EU has become a net importer of sugar following the major reform of the sugar market regime in 2006.

In addition to this, the EU statistics show that beet production has been declining although the yield has been slightly increasing. There is therefore, the need to examine the various regulatory and market conditions affecting beet producers in an attempt to understand current and potential challenges in the sector. This is done using Belgium as our case study, but also by drawing comparisons among other EU member states.

4.1.4 Beet production in Belgium

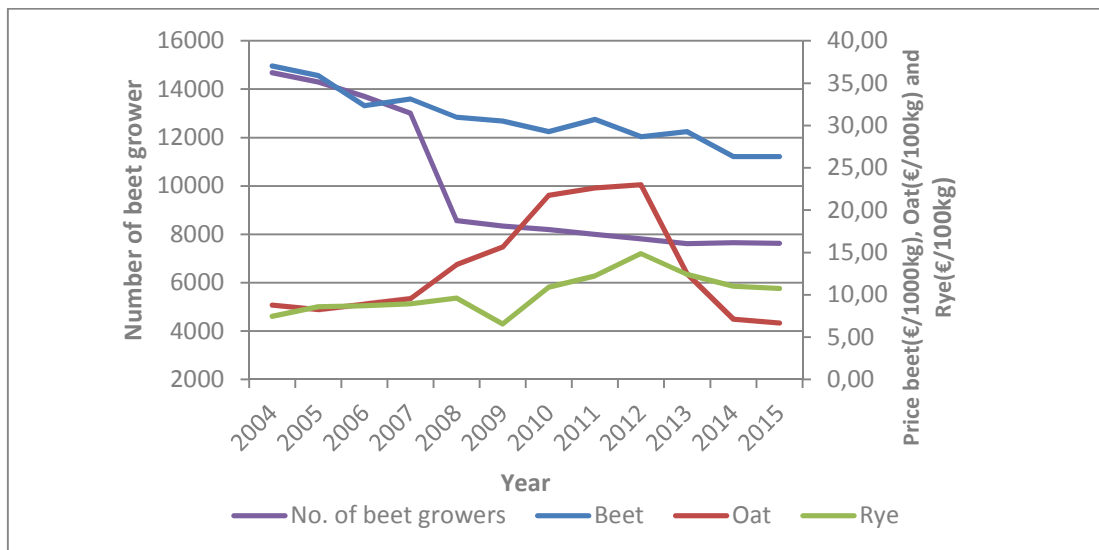
Following the restructuring of beet production between the period of 2006 and 2010, there has been an extinction of many sugar factories and growing areas in Europe. For instance, production in 2014 was 30% lower than the figures prior to the reform (Szajner, et al., 2016). Production is now concentrated in regions with the most favourable soil, climatic and structural conditions. The combined share of Germany, France, Poland, United Kingdom and Netherlands now stands at approximately 73% of EU production of sugar beets compared to 62% in 2004 (Szajner *et al.*, 2016). Other countries have ended their production while some have reduced their production significantly. Nonetheless, Belgium remains the sixth largest beet producer in the EU with total harvested beet area of about 60,000 hectares in the 2014/2015-crop season. This represents about 4.5% of the agricultural area in Belgium. The total sugar production from beets is about 816,000 tones (CEFS, 2015).

There are nearly 8000 beet growers in Belgium spread across the 14 agro-ecological zones (CEFS, 2015; Peeters, 2010). The number of beet growers has been declining steadily over the last decade with a sharp decline occurring between 2007 and 2008 (see figure 4.2).

The reason for the sharp decline is not explicitly known but the period coincides with the time of significant rise in global food prices. Since beet is grown mainly as a rotational crop, it can be said that farmers switched to crops that were more profitable at that time. In order to explain further this line of reasoning, we present the prices of beets versus oats and rye (other food commodities grown by Belgian farmer) over the same period on figure 4.2. It can be seen that while the prices of oat and rye were rising between 2007 and 2008, the price of beet was declining at the same period. Farmers might have therefore postponed beet growing for that growing year to make room for crops with higher market prices.

Nonetheless, the sharp decline has been sustained after the 2007/2008 food price spikes, which means that there could be other factors accounting for decline in the number of beet growers. As captured in the Agrosynergie report, the structure of the beet sector behaves similarly to the dynamics in agriculture, where mostly, there is a decreasing in the number of holdings and an increase in average area per farm in the long run (Agrosynergie, 2011). This situation is further highlighted with data in section 4.2, but the decline in the number of beet growers could be partly attributed to natural trend of concentration in agriculture over time.

Figure 4.2 Number beet growers, prices compared with other crops in Belgium



(Source: CBB, Eurostat)

Farmer Erik: *"In 2006 was the first restructuring of the sugar beet sector and there were a lot of factories closed in Europe. So a lot of beet growers had to stop, but also in their own region, the production and the quota then went down and that also had the result that many people have actually chosen for their money and left the remainina beet aquota to others."*

According to the information gathered in interviews, the restructuring of the quota system caused the sharp decline in the number of farmers in 2006. This restructuring was due to the closure of several factories and thus the reduction of available quotas. In consequence Belgian sugar beet farmers who could not compete with the Belgian yield were encouraged to leave the market.

Farmer Jaan: *"In 2006 or 2007 there had been a serious price drop, that was tough for us. But that was partially compensated by an increase in payments. The payments of the beet growers increased per ha on the basis of the quota, you have."*

Nevertheless, it is true that sugar beet farmers had to cope with a price drop in 2006 as well. However, this price reduction was compensated by European subsidies. Although it was stated that farmers could decide to change to other crops, in the past this possibility was limited by the quota system and the inter-professional contracts

between the farmers' union and the respective factory. Moreover, the Common Agricultural Policy obliges farmers to apply crop rotation. Therefore, if growing sugar beet is terminated, an alternative needs to be found. However, several farmers stated that alternatives are difficult to find. Alternatives have to fit the agronomic conditions, but have to be profitable as well. The same problems that farmers faced due to the restructuring of the quota system in 2006, will become relevant once again due to the termination of the quota system.

Interviewer: *"And how do you react to this fluctuations? Are you then producing more or less?"*

Farmer Wout: *"We are or we were obliged to fulfill our quota, thus the quota also means that we have to deliver our sugar beets to the factory. And we cannot play with that."*

Interviewer: *“The next year the quota will phase out. How do you think that the prices will evolve?”*

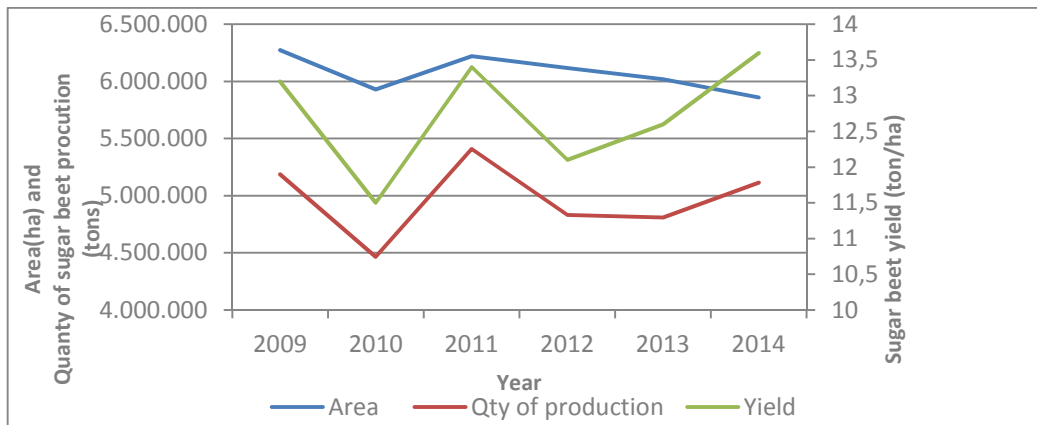
Farmer Wout: *“Yes, this is of course a bit observing, everyone compares the sugar sector with the phasing out of the milk quota and for the milk quota it is disastrous. It was a real disaster and it is still a disaster. But there is of course an important difference between sugar beet and milk. Sugar beet for example on my farm if we are free, if we do not have a quota and the crop is not profitable we can immediately switch to another crop, well not immediately but we can search for a replacement. Milk quota: They have built stalls, they did a heavy investment, they cannot escape, they have to continue. We can potentially opt for another crop and quit with sugar beet. But, yes, this is also easy to say, easier said than done. That is not so simple, because the alternatives that exist, are also not smashing. The grain price was never that low as now and everything is related to the grain price. Therefore, the crop farmers associate their price to the grain price and that is actually so difficult in agriculture, that the grain price is so low.”*

In addition, from figure 4.3 below, it can be seen that there has been some divergence between beet production in tons and total area of cultivation in Belgium since 2011. Thus, the total utilized area for beet production has been slightly decreasing while volume of production has been quite stable. The stable volume of production coupled with decreasing area of production is due to increasing yield through improvement in growing technology and effective input usage. Belgium ranks second in terms of yield and sugar content among the EU member states. The trends in farm sizes, quantity of production and yield were partly triggered by regulatory reforms in the beet sector, which we discuss in section 4.2.

The interviews revealed that it is predominantly due to improved sugar beet varieties that the yield could increase constantly over the last years.

Farmer Niels: *“Fuh, yes, so genetics in the sugar beet goes forward, go fast forward. The genetics in the sugar beet goes between 1 and 1,5 % per year forward. Whereby the yield increases each year for sugar beet. This is huge in comparison with other, in comparison with wheat for example has 1% in as much as 10 or 15 years approximately. For sugar beet this is continuous, thanks also to the seed companies, the breeding, the sugar beet institute Tienen, the Royal Belgian Institute for the Improvement of the Sugar Beet which is co-financed by so many Ministries, also by the sector, the factories, and the farmers. This is good, these are indeed important things.”*

Figure 4.3 Area of beet cultivation quantity of production and yield in Belgium

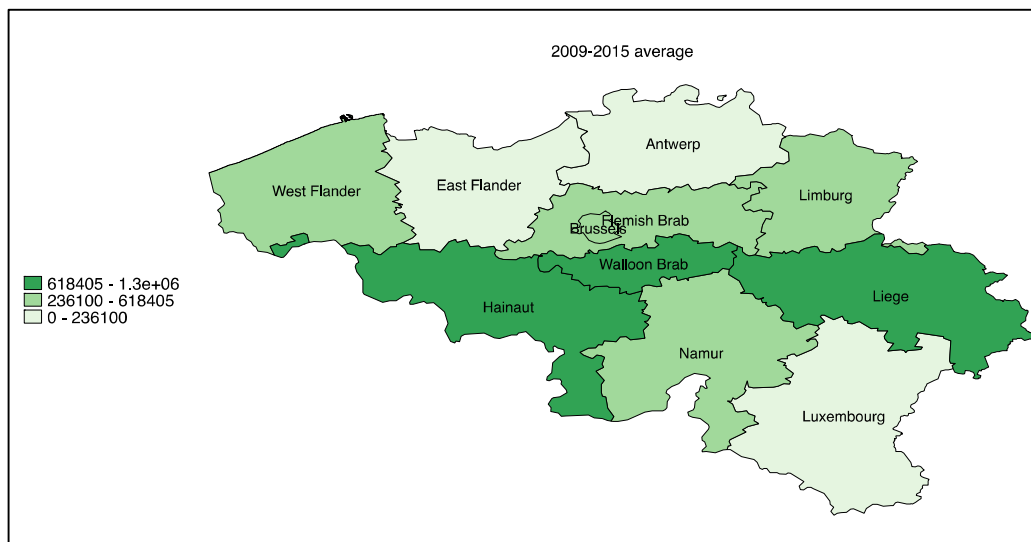


(Source: CIBE, 2015)

4.1.5 Provincial beet production

Production of beet is predominant in the Wallonia region in Belgium. The region accounts for 64% of total beet production in Belgium (DGO3, 2016). From the map below, it can be seen that beet is grown predominantly across the middle portion of Belgium with Liege, Hainaut and Walloon Brabant being the three largest producing provinces. Research shows that the crop grows well in loamy and sandy-loamy soils, which are the characteristic of soils found in these provinces. The yield is therefore highest across the middle belt provinces of Belgium that are all in the Wallonia. The least producing provinces are Luxemburg, Antwerp and East Flanders.

Figure 4.4 Average beet production (tons) in major provinces in Belgium



(Source: FOD Economie)

Farmer Theo: *“Mainly the climate, this is here better than anywhere else. If you go more north or south it is worse.”*

Farmer Wout: *“The climate, here the sugar beets flourish best. Here we have the most fertile soil of Europe.”*

The interviews made clear that the climatic conditions and soil properties within Belgium constitute one of the main competitive advantages (together with farmers’ expertise and proximity to factories).

4.2 Policy and regulatory conditions

4.2.1 Introduction

Beet cultivation has been the backbone of sugar production in Europe over the past two centuries with the bulk of EU’s sugar coming from beet. Recently, the crop has also become useful in the production of other industrial products such as bio-ethanol, biofuel, biogas and animal feeds. With growing environmental concerns, sugar manufacturers now convert all parts of beet into valuable products without any waste (CIBE, 2003). Beet is therefore one of the most important industrial crops in many member states including Belgium.

Although byproducts are produced, the interviews made clear that for farmers the most important income source regarding sugar beet is sugar production. Pulp that is a spin-off product of sugar production is mainly sold as animal feed. Although the conversion of sugar beet to bio-ethanol or bio-plastics would be a more environmentally friendly solution to the conventional products, they are not competitive. Accordingly, the production of bio-ethanol and bio-plastic remain marginal. Moreover, farmers argue that if bio-ethanol or bio-plastic is produced the respective factories pay a lower price than the sugar beet factories. Thus, bio-ethanol and bio-plastics may be a source for additional income, rather than a substitute.

Interviewer: *“Are there any new applications for products from sugar beet in the future that may arise in Belgium?”*

Farmer Jaan: *“They are busy with things like that, but that won’t make the difference for a farmer. They are going to make packaging out of sugar. But that won’t make a difference, we get payed the European price, so they are making byproducts. That’s also with the gasoline, they only make it out of rapeseed when it’s cheap, otherwise not.”*

The importance of the sector has stimulated many policy regulations in the sector since 1967. These regulations have evolved over time and are based on various EU reforms and World Trade Organization (WTO) /Generalized Agreement on Tariffs and Trade (GATT) stipulations. Although this report looks at the Belgian beet sector, most of the policies and regulations emanate from the EU Common Agricultural Policy (CAP) and the sugar Common Market Organization (CMO) that regulate agricultural and income activities of primary producers within the EU.

4.2.2 Legislation and regulation

The European sugar industry is regulated under sugar Common Market Organization. The sector is unique with its production quotas, minimum beet price and trade mechanisms which have evolved

over time (Maitah, *et al.*, 2016). The production quotas, minimum prices and other trade regulations mean that there are policies and regulatory measures at different levels in the beet supply chain, thus from the farm level to the exports and imports. Nevertheless, all these measures, irrespective of which aspect of the supply chain they may apply, have direct influence on beet cultivation by growers. There is therefore the need to conduct a holistic assessment of all regulatory measures regarding the sugar beet sector ranging from farm level to foreign policies regarding trade.

The beet sugar sector is one of the most regulated agri-food sectors in the EU. The aim of these regulatory measures is to control supply, foreign trade policies and market prices for both consumers and producers. In order to guarantee the profitability of beet production, self-sufficiency, stabilized prices and food security, the EU introduced regulations in 1967 under the common organization of the markets in sugar. The regulations became operational in 1968 and served as the standard guide to sugar and beet production in the European Economic Community (EEC). This was done at the time when majority of the EEC member states were net importers of sugar. Following the regulations that were in the form of protectionist market policy, Belgium and many of the western EU countries became major producers making the EU a net exporter of sugar. The actual measure in the 1967 regulations of the EU was the introduction of sugar quota within member states. The policy with regulation number 1043/67/EEC of the commission in 1967 stated details of how the quotas had to be calculated and what constituted sugar production within the EU.

The policy regulated sugar production and marketing, and for that matter beet cultivation within the member states. It also included trade agreements that involved preferential trade agreements with African, Caribbean and Pacific (ACP) countries and India. A major component of the policy was the Variable Import Levy (VIL). This allows a fixed threshold price, which defines the minimum price at which imports from non-member states could freely enter the EU. Imports were also taxed at variable rates that equalled the difference between the world and the EU threshold prices. Sugar production was classified as “A” and “B” sugar, known as quota sugars, which were eligible for price support under the sugar policy. Production in excess of the quota were labelled “C” sugar, which must be exported at prevailing world prices (McDonald, 1996).

The policy also created a situation where on the average; the producer prices were more than twice the world price, which had substantial effects on production (McDonald, 1996). This led to production booms and consequently made Belgium and the EU as a whole a net exporter.

The quota policy scheme continued its operation for some time until the United Kingdom (UK) joined the EEC in 1973. The joining of the EEC by UK necessitated a change due to its commitment with other countries under the Commonwealth Sugar Agreement (CSA). However, there was no consensus until the UK’s accession (McDonald, 1996). Thus, although the sugar policy was implemented and subject to periodic reviews, several attempts were unsuccessful until 1995 after they had been rolled forward for three times. Even though there were external agreements such as the obligations from the GATT and other major EU reforms, the policy did not undergo any drastic changes until 2006. Table 4.1 summarizes policy measures that were in existence as of 2006.

Table 4.1 Summary of sugar sector regulations

Chain level	Regulatory measure
Beet growers	<ul style="list-style-type: none"> • Minimum buying price of beet with standard content of 16% was EUR 47.67 per ton for A sugar and EUR 32.43 per ton for B sugar
Sugar	<ul style="list-style-type: none"> • Intervention price was EUR 631.9 per ton • Stimulating domestic demand through possible intervention purchase
Import	<ul style="list-style-type: none"> • Import tariff of EUR 419 per tons • Preferential treatment and tariff quotas to group of countries such as: <ul style="list-style-type: none"> ○ duty free quota for less developed countries ○ duty free quota for ACP countries and India ○ duty free quota to Balkan countries ○ reduced duty of EUR 98 per ton as preferential CXL²² tariff
Export	<ul style="list-style-type: none"> • Out of quota sugar were exported to third countries without subsidies by end of season or credited to quota production in the following season. • Gradual reduction of export subsidy in GATT obligation • WTO quota of subsidized export support stood at 1.3 million tons and value of support stood at EUR 497 per ton

(Source: Summary from Szajner et al. (2016))

Table 4.1 illustrates various protectionist regulatory policies. The VIL has been eliminated and replaced by tariff equivalents, which was scheduled to decline at 20% in six-year stages starting from 2006. The budget financing these policies were self-generated from levies charged to beet growers and sugar manufacturers as a form of co-responsibility arrangements.

The above policies were heavily criticized for higher prices of sugar in the EU internal markets, and inefficiency on the part of beet growers due to their lack of motivation to cut down costs of production, among others. The continuous criticisms and the strive for trade liberalization by free trade advocates, led to a major reform of the sugar market regulation in 2006 that limited the quota production.

The new regulatory measures under the 2006 reform are summarized below.

²² The CXL import quota is a supply of raw sugar cane that has preferential access to the EU market as a direct consequence of previous EU enlargements

Table 4.2 Sugar market regulation reforms in 2006

Chain level	Regulatory measure
Beet growers	<ul style="list-style-type: none"> • Minimum buying price of beet reduced to EUR 26.26 per ton • Special fund to aid beet growers and diversification • Decoupled direct payment to low income growers
Sugar	<ul style="list-style-type: none"> • Sugar production quotas were A and B combined into one • Intervention price of sugar replaced by reference price of EUR 404.4 per ton
Import	<ul style="list-style-type: none"> • Tariff and preferential treatment of ACP, LDCs²³, Balkan countries.
Export	<ul style="list-style-type: none"> • Development of out of quota sugar • Export refunds

(Source: Summary from Szajner et al. (2016))

The major reform of the sugar market in 2006, which led to simplifications and greater market orientation of the EU's sugar policy, made the EU a net importer of sugar again. The reforms, which have been in operation since 2007, limited total EU production quotas for food purposes to 13.5 million metric tons of white sugar equivalent (Polet, 2015).

In addition to these central regulations from the EU, the processors in Belgium also have certain regulations and legislations for farmers to follow. For example, the Raffinerie Tirlemontoise, the largest sugar manufacturing company in Belgium ensures growers oblige to regulations, developed by their agronomists, about which variety to choose, the right sowing conditions, the growth of the beets and the use of fertilizers and pesticides. They also engage the services Institut Royal Belge pour l'Amélioration de la Betterave ASBL (IRBAB) a non-profit association that works towards improving beet quality through certification of new varieties. Beet growers can only use beet seed that is certified by the institute. Growers must follow these regulations to ensure they produce quality beets for the processors.

4.2.3 Impact of reforms: Number of farms and beet area per farm

The regulatory reforms reviewed above have affected the beet sector in terms number and size of farms in Belgium and other member states.

Number of farms: The table below (table 4.3) shows the trend of the number of farms during the major reform periods. The number of beet farms for most EU member states decreased rapidly after the reform period 2005-2009 compared to the trend before. In countries such as France and Poland, the declines in the number of farms were moderate. In Belgium, the decline in the number of farms was remarkable after the 2005-2009 compared to the low declines that had preceded the reform. The acceleration ratio of 6.8 was the second largest after Hungary. The Belgium beet sector was therefore one of the highly responsive countries to the policy reforms in the EU in terms of decrease in the number of farms.

²³ Least Developed Countries

Table 4.3 Trends for number of farms during reforms

	Long-term trend	Recent trend	Trend before reform	Trend after reform			Acceleration due reform Ratio(2)/(1)
	1995-2005	2005-2007	2000-2005	2005-2009	2005-2007	2007-2009	
			(1)	(2)			
FR	-2.9%*	-2.50%	-3.00%	-4.70%	-1.60%	-8.10%	1.6
DE	-3.10%	-1.70%	-2.90%	-7.20%	-7.00%	-8.60%	2.5
PL	7.0%**	2.30%	-6.8%**	-10.80%	-8.20%	-16.10%	1.6
UK	2.20%	-3.10%	-4.50%	-9.20%	-13.40%	-7.00%	2
NL	-2.80%	-1.60%	-3.80%	-8.60%	-5.80%	-13.00%	2.3
ES	-1.60%	-3.40%	-6.70%	-13.40%	-17.10%	-14.80%	2
BE	-2.70%	-1.40%	-1.50%	-10.20%	-4.60%	-17.40%	6.8
IT	-3.00%	-1.50%	-9.10%	-18.90%	-32.70%	-14.40%	2.1
HU	-3.8%**	0.40%	-1.7%**	-20.00%	-7.30%	-38.20%	11.8
SK	-2.3%**	1.60%	-5.6%**	-13.30%	-21.40%	-9.00%	2.4
EL	0.40%	-1.70%	-4.80%	-13.50%	-33.30%	19.10%	2.8
FI	-3.00%	-4.50%	-4.60%	-14.00%	-17.10%	-16.50%	3
EU-15	-1.20%	-1.60%	-5.10%	-10.80%	-14.80%	-9.60%	2.1
EU-27	Nap	-2.10%	-7.40%	-11.70%	-14.70%	-12.30%	1.6
12 NMS²⁴	Nap	-3.50%	-10.50%	-13.70%	-14.50%	-18.10%	1.3

(Source: Adapted from Agrosynergie (2011))

Average beet area per farm: Although the number of beet farms decreased, the average beet area per farm in Belgium increased after the 2005-2009 reforms. The high level of concentration implies that the decrease in number of farms was as result of the extinction of smaller farms. This may also mean that the areas that dropped out of beet production were taken over by other farmers as can be seen on the table 4.4 below. From the table, it can be seen that majority of beet farms in Belgium have average sizes between two and five hectares. The number of farms with sizes lower than 2 hectare sharply decreased from 860 in 2005 to 110 in 2013 while we see an increase in the number of farm with sizes between 5 and 9.9 hectares from 230 to 340 between 2010 and 2013.

²⁴ Non member states

Table 4.4 Evolution of farm sizes of beet farms in Belgium

Farm sizes				
Year	< 2 ha	2 - 4.9 ha	5 - 9.9 ha	10-29.9 ha
2005	860	3,230	690	0
2007	730	2,910	600	60
2010	140	1,220	230	0
2013	110	1,160	340	0

(Source: Eurostat)

This is also confirmed by similar trends for France, Germany, Poland and the UK in (Agrosynergie, 2011). The table 4.5 gives a summary in the EU member states as well the average trend for the entire EU-15 and EU-27.

Table 4.5 Trends in the average beet area (ha/farm) per farm

	2000	2005	2007	2009	2000 – 2005	2005- 2009	2005 - 2007	2007 - 2009	Ratio
					(1)	(2)			(2)/(1)
FR	11.0	12.3	12.7	14.3	2.40%	4.10%	1.70%	6.30%	1.7
DE	8.3	9.0	9.8	11.0	1.70%	5.50%	4.40%	6.10%	3.2
PL	2.9	3.8	3.7	4.8	6.40%	6.30%	-1.20%	14.10%	1
UK	17.0	18.9	21.5	24.7	2.20%	7.60%	6.90%	7.30%	3.4
NL	5.8	5.9	6.0	7.1	0.10%	5.20%	0.90%	9.50%	71
BE	6.1	6.1	6.5	7.5	-0.20%	5.90%	4.00%	7.10%	++
IT	3.5	6.3	6.5	6.4	16.30%	0.60%	2.00%	-0.80%	--
ES	4.0	5.3	4.8	5.0	6.70%	-1.20%	-4.80%	2.70%	--
FI	10.7	13.5	10.5	14.6	5.20%	2.00%	-11.10%	19.40%	0.4
SK	56.8	83.4	85.7	87.8	9.40%	1.30%	1.40%	1.20%	0.1

(Source: Adapted from Agrosynergie (2011))

In summary, the Belgian beet sugar sector's regulatory policies are embedded in the EU's CMO and CAP policies. They involve mainly three key components; production quotas, minimum beet prices and trade mechanisms. These three mechanisms have gone through changes over time and the quota system is finally due to end in 2017 under the new CAP agreement. This will pave way for farmers and processors to adapt to a less regulated market system.

For the beet sugar sector, there has been nothing like soft landing measures as was the case for the dairy sector, and there have been already speculations about the future of beet cultivation and sugar production. Based on the existing regulatory policies, we assess in the next section, the marketing conditions at the beet sugar sector.

The interviews with farmers made clear that their future perspective depends on the factory they are delivering to. Prices for 2017 remain stable for farmers delivering to local sugar, while farmers delivering to Tiense Suiker will have to deal with a substantial price drop.

Moreover, farmers described a price war scenario that will arise in the next years. This would indicate problems related to market power within the sugar sector.

Farmer Niels: *“And they say:”After X amount of years the weaker factories will vanish themselves from the market and the stronger ones will remain”, this is a bit strategy. And in order to be part of the stronger ones the costs in all areas have to... And what is the biggest cost for a sugar manufacturer, this is the purchase of the raw materials and the raw material is our income. And this is actually a bit our problem.”*

Farmer Lars: *“The Tiense are global, they want to start an acquisition campaign, I have the feeling, by pressing down the prices. Through which sugar beets will be sowed for which I am sure that they will make deficits.”*

Farmer Jasper: *“So, is there a difference? We with ISCAL have, can negotiate a bit better but on the other hand they feel the hot breath of Sudzucker and if they can start with low buying prices for sugar beet, they can probably try to steal customers from our factory and this is maybe a bit the aim of the other, if they have a higher buying price of the sugar beets, it can be that they lose clients. And then they have to reduce our price as well and then we are in a negative spiral, I would say.”*

Interviewer: *“Will other farmers also quit in the future, after the quota, you think?”*

Farmer Erik: *“Yeah sure, at first natural outflow which will always be the case. On the other side you have economies of scale. And whether there will be an additional outflow depends on the conditions that we are going to get. I have the feeling that the sugar farmer still give the benefit of the doubt to the producers for 2017, but they’re very critical and very reluctantly yet to last a year with the system.”*

4.3 Market conditions

4.3.1 Brief market description

After beet harvesting, the sugar content tends to decrease over time. For this reason, most countries tend to have sugar refineries sited at close proximity to the beet growing area. This reduces the time lost before processing and the transportation costs. Sugar beet marketing is determined in the EU primarily by the quota system under the sugar CMO. The regulations governing the sugar sector allocates quota to sugar producers that in tend allocates them to beet growers in a delivery agreement. Beets produced in excess of the given quota are considered out-of-quota or the “C” sugar beets. For the quota beets, the EU has minimum price that beet growers receive. The recent minimum price that sugar factories must pay to farmers is EUR 26.29 per ton. Before the 2006 reform, sugars produced from the “C” sugar beets were exported without refund. This means the prices growers received correlated with that of the world prices. This is not the case anymore after the reform and the pricing behavior has since changed as well. The prices are now set based on negotiations between the growers and processors. This is the main beet marketing situation in Belgium and in other EU member states since the inception of the quota system and particularly, after the 2006 reforms.

4.3.2 Market conditions: volume, prices, export countries

The sugar regulatory measures discussed in section 4.3 mean that the overall beet sugar supply chain operates under much regulated conditions in Belgium and in other EU member states. Thus, beet growers and processors must operate under certain market conditions regarding the volume of production, prices and exports.

Volume: The table below shows that the total quota of beet production has decreased over the last 11 years from 819.511,621 tons in 2004 to the present value of 676.235,000 tons. Annual production that takes into account previous year's stock has also decreased on the average over the years with fluctuations from year to year. With the quota system due to end by 2017, these numbers will provide a guide to the actual capacity of the Belgium beet growers. Currently, growers produce more than the given quota. However, this could still be below the maximum capacity as many farmers may not be willing to produce out-of-quota beets that receive lower prices compared to the minimum price for quota beets.

Table 4.6 Quantity of beet production versus quota

Year	Quota (tons)	Production (tons)
2015	676.235,000	732.244,545
2014	676.235,000	815.694,553
2013	676.235,000	783.168,318
2012	676.235,000	761.533,395
2011	676.235,000	880.659,771
2010	676.235,000	689.184,831
2009	676.235,000	843.157,974
2008	676.235,000	721.626,776
2007	763.190,365	873.352,015
2006	862.077,000	855.771,091
2005	726.439,805	925.265,884
2004	819.511,621	990.585,259

(Source : CBB)

Farmers pointed out that the reason for producing more than quota would require is due to risk management reasons. Farmers know that they will not get the full price for out-of-quota sugar beet. Nevertheless, they try to produce about 120% in order to buffer against bad harvest. Farmers who cannot fulfill their quota are punished with a fine by the factory.

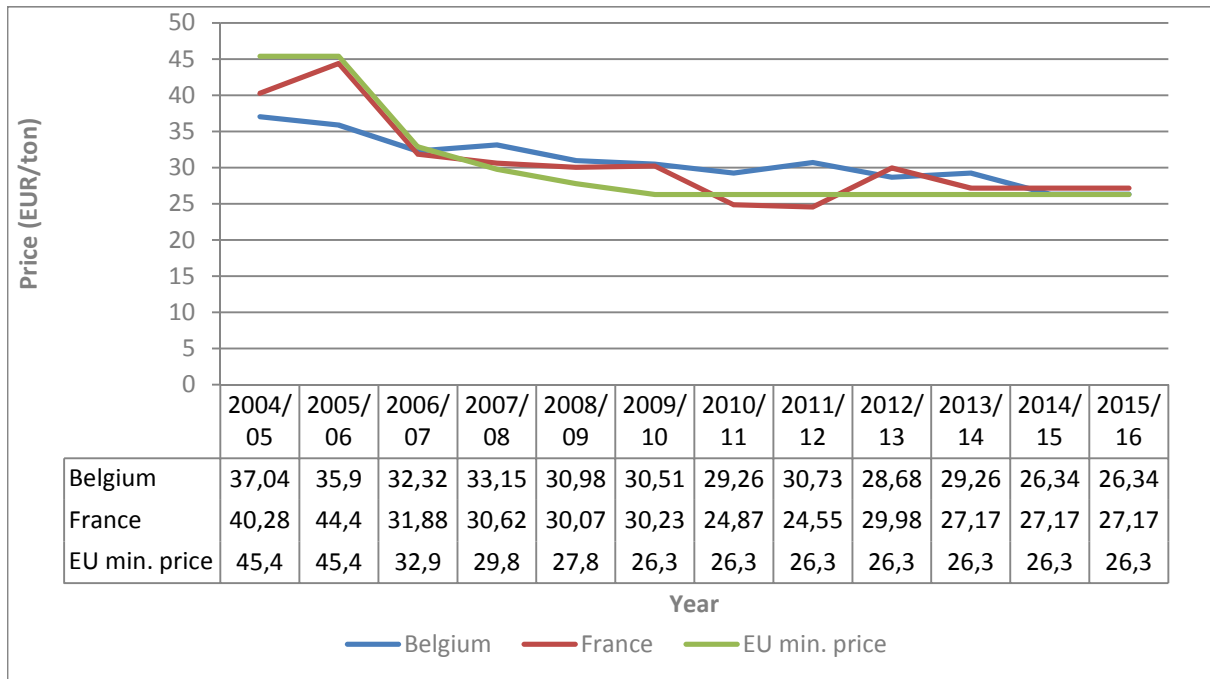
Farmer Jaan: "In the case of the beets we have to produce 118 percent or we get fined, and that's sad."

Farmer Jaan: "Additionally, if your quota isn't full, they are going to fine you by 1.5 euro per ton. So if you have a 1000 ton quota and you only produced 900, they will take back 1.5 euro per ton."

Prices: Compared to the EU minimum price for quota beet, Belgium growers received higher prices since the 2006 major reform as shown in figure 4.5. To draw a better comparison we also show the

price received by beet growers in France, one of the largest producing countries in the EU. It can be seen that the prices received by growers in both countries are similar with Belgium prices mostly above that of France.

Figure 4.5 Belgium beet price in comparison with the EU minimum and France



(Source: Agrosynergie (2011); Eurostat)

Exports/Imports: Generally, beets from Belgium are not exported to other countries due to the lost in sugar content when kept for a long period. Processing plants are therefore sited close to growing areas to minimize traveling distances. The processed beet products such as refined whites sugars are however, exported and this is discussed under the beet sugar supply chain in the next subsection. There are also no evidences of beet import from other countries apart from raw cane sugars, which are imported by processing factories during off beet seasons.

4.3.3 The overall supply chain

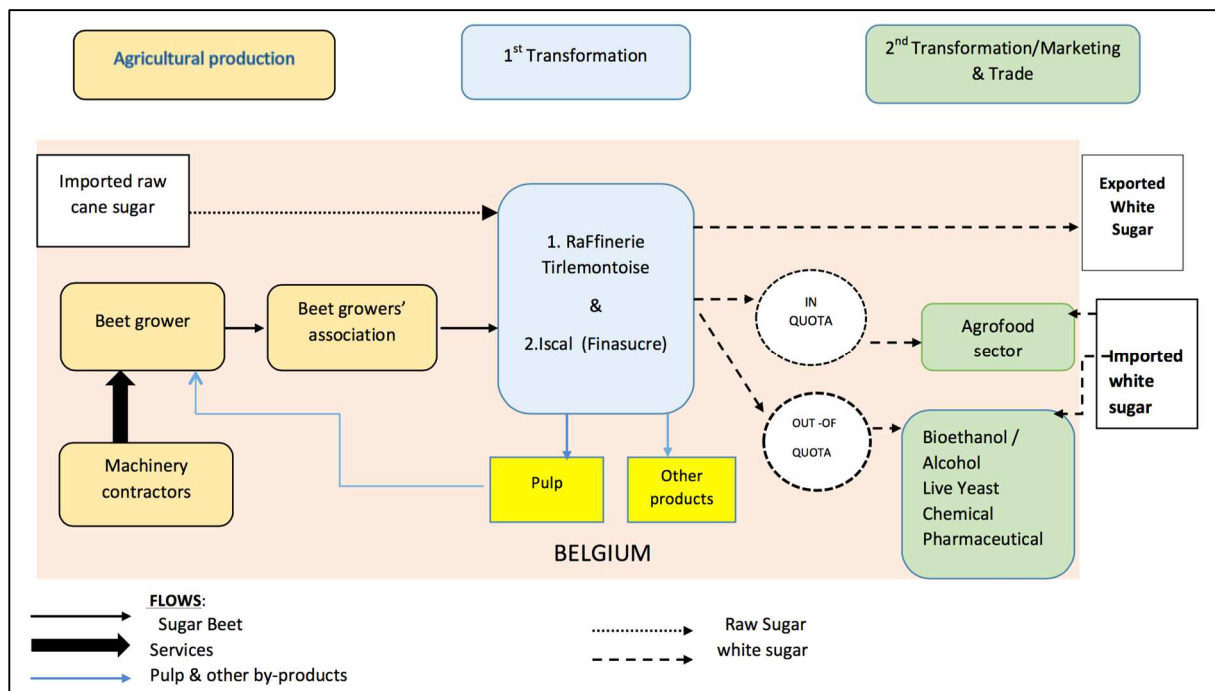
The supply chain of the Belgian beet sugar sector is similar to other beet producing member states in the EU. We present in figure 4.6, the various stages of the beet supply chain in Belgium highlighting key players and factors.

The production phase of the supply chain, involves the use of machineries for activities such planting and harvesting. Farmers depend on contractors of those machineries or their associations for such operations. As mention earlier, there are nearly 8000 beet growers in the production phase of the Belgian beet supply chain.

Interviewer: "Are there also other strategies which you apply in order to safe costs? Such as common purchasing of production factors, investment in new machinery, purchase of machines with a machinery ring or with the usage of wage work?"

Farmer Wout: "No, no. We don't do this here, machinery ring and so that is here actually not popular because the sowing period for and the cultivation period of the crop is too short that it is almost impossible to profit from a machinery ring and to let each farmer rent machines, that hardly works."

Figure 4.6 The Belgium sugar beet supply chain



(Source: Adapted from (Agrosynergie, 2011))

The next phase in the supply chain is the processing phase where the beets are converted to sugar and other industrial products. Presently, there are only two main operating sugar manufacturers, Iscal Sugar SA (under the Finasucre group) and Raffinerie Tirlemontoise (Dutch: Tiense Suiker) in Belgium. Tiense Suiker has been an affiliate to the Südzucker group (one of the five dominant sugar companies in the EU) since 1989. The two companies together operate seven subsidiary factories located in *Bruglette, Fontenoy, Genappe Wanze, Veurne, Moerbeke* and *Tienen* all in Belgium.

The two companies also refine raw cane sugar imported from other countries following the 2006 reforms, which permitted importation of raw cane sugar even by end-users of sugar. However, their

primary source of raw material is beet from Belgium growers. These two processors are therefore responsible for individual farmers' contracts regarding quota and out-of-quota beets based on regulations outlined in section 4.2. The sugar quota allotted to Belgium is presently 676,235 tons, which represent about 5 % of total quota production in the EU. Out of this number, the Tiense Suiker, and affiliate of the *Südzucker* group, has about 72 % share making it the largest sugar processing factory in Belgium (Maitah *et al.*, 2016). We compare the activities of the two processors in terms of prices they offer to growers in table 4.6 below. It can be noted that, growers receive identical prices from the two factories for the quota beets. In periods where the prices differ, Iscal sugar offered slightly higher prices than Tiense Suiker did, as was the case between 2009 and 2013. The pricing pattern is similar for the out-of-quota beets in the recent periods.

This pattern was confirmed by interviewed sugar beet farmers, who stated that the additional payments were higher at Iscal Sugar than at Tiense Suiker. The same applies for the price of sugar beet pulp that farmers received. However, in the last years neither farmers delivering to Iscal Sugar nor to Tiense Suiker received an additional payment. Nevertheless, the pattern that could be observed will be even more pronounced in the future. It was already pointed out above the Iscal Sugar will pay higher prices than Tiense Suiker. For farmers this constitutes an unfair situation. Apart from the difference within Belgium farmers pointed out that the strategy of Tiense Suiker, or *Südzucker*, is questionable. Although, Belgian farmers and factories perform better than the German counterparts, farmers receive the same price.

Farmer Jaan: *“But now they want to drop the price with 5 euro so that they make all the profits and we don’t, that’s sad. Additionally, ISCAL, the factory, the counterpart, is still going to pay the same price for 2017 as now. I made a joke about bringing my beets to them at the congress in Dinant where the people of Tienen also were. But it doesn’t work like that. It is not fair that they get 5 euro more than we get, a few cents wouldn’t bother me. The issue is that we depend on Germany and that company made a lot of losses, so now we, the Belgian framers, have to repay those losses. Also the German farmers but we too while our company is doing great, that’s sad. The German company hadn’t foreseen the changes of the quota, while Tienen invested to improve the production. That’s the reason for the profits and they can have their profits. But that we have to pay the losses of the Germans, that’s not fair. It’s not fair that we don’t even get a cent more than the German farmers.”*

Interviewer: *“There are only two manufacturers in Belgium, as you said already. Is there a difference in the price evolution between the two?”*

Farmer Jasper: *“Post quota indeed, otherwise there was a fixed price, Europe had fixed a minimum price. But if ISCAL can sell better than Tienen, we had for example a better additional price than Tienen. This can also be the other way around. But now with the contract prices, Südzucker says to Tienen: “you can only promise this amount to the farmers.” And it can be that the factory Tienen earns much more than the factory of Südzucker in Germany. But they do not want that the farmers of Tienen earn more than the farmers in Germany. So that they do not get more. “*

Interviewer: *“And is there space for more consultation within the chain in order to protect the profit margin?”*

Farmer Theo: *“From their side, the side of the factory, I do not think that there is more margin (laughing). The factory Tienen depends on Germany and there they got to the agreement that it is 18 Euros. A German shareholder of the factory would not allow to pay more for their sugar beet. Even though it is better here and they can pay more. They do not want to do this. And these are the real shareholders, we are also shareholders, but they have 60% of the factory of the farmers. But here they have 10%. “*

Regarding the spread of risks and profits along the supply chain, farmers clearly stated that they have to bare most of the risk, as the price they receive is low or too low, hence not covering the costs.

Interviewer: *“Is there something what we can do about this? A solution for the regulation of the prices?”*

Farmer Wout: *“I think that there has to be an equitable distribution of the profit margins, so we know that as shareholder, we are as farmers also for a little part shareholders and each year we get to see the results from ISCAL and they are very good, they earn a lot of money with us, with our products. And it should not be that this is not distributed evenly. I have always heard that in the shop one does not sell anything below the costs or with losses and in agriculture this happens every day.”*

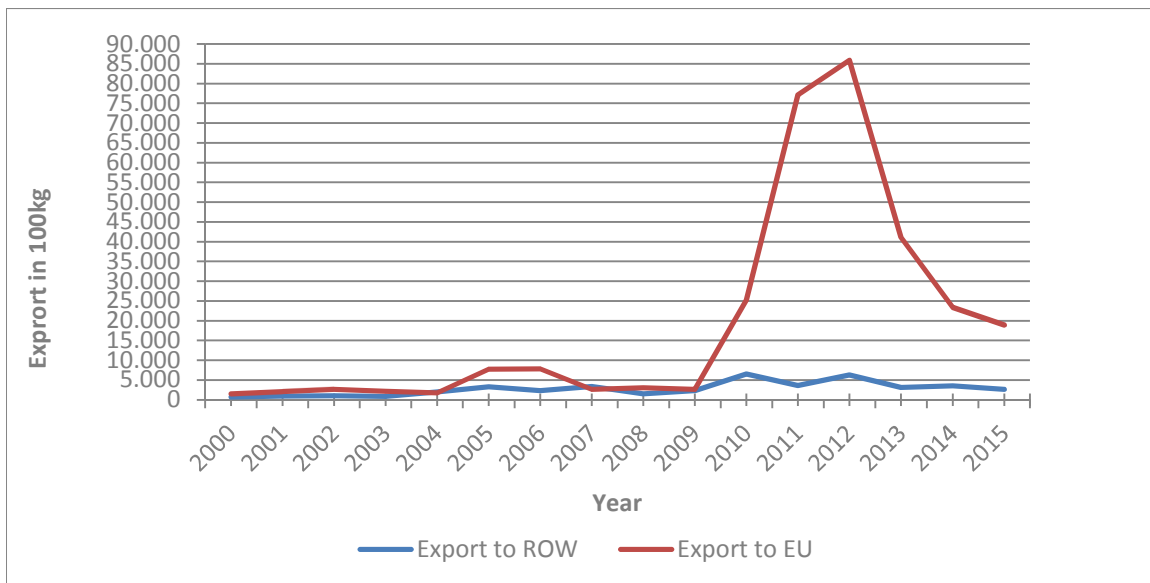
Table 4.7 Prices offered by the two processors in Belgium (EUR/ton beet at 16°Z)

	Quota beets		Out-of-quota beets	
	Iscal Sugar	Tiense Suiker	Iscal Sugar	Tiense Suiker
2005	47,70	47,88	12,00	12,00
2006	32,86	32,86	18,00	24,43
2007	28,91	28,91	15,00	16,00
2008	26,95	26,95	-	18,00
2009	28,64	26,18	20,00	20,00
2010	29,10	27,27	23,82	23,60
2011	39,96	38,44	24,98	26,16
2012	45,57	45,06	26,29	22,00
2013	35,41	31,99	-	19,05

(Source: CBB, FOD-Economie)

The final stage of the supply chain is the marketing and distribution to end users such as retailers and industries that use sugar as sweeteners for both food non-food products. Although bulk of the sugar produced in Belgium is consumed internally, there is also significant export to other member states in the EU and the rest of the world (ROW) as can be seen from figure 4.7 below. One notable trend is the rate of decline in sugar export to the EU. However, the reason behind this is not known yet.

Figure 4.7 Refined white sugar exports by Belgium



(Source: Eurostat)

4.3.4 Actors and marketing evolutions: standards, concentrations, farmer groups

Standards: Since 2007, after the establishment of a new sugar regime at the European level, the beet sugar sector and in particular the sugar companies have sought to improve the profitability of their production (LEGRAND et al., 2016). This has forced the introduction of standards in beet cultivation.

Standardization guides the conduct of farmers to engage in good practices. At the same time, it can also present a challenge to farmers since some of these standards involve investment in technology and innovations.

The various CAP reforms introduced certain growing practices and standards in order for farmers to meet direct payment requirements. These standards are binding to beet farmer as well. As of 2005, the EC's council regulation No. 1782/2003 oblige farmers to meet a certain minimum set of environmental standards. These standards include preventing soil erosion through appropriate measures, maintaining the soil structure, standards for crop rotation where applicable and many more.

Beet growers have also been working towards their own production standards. It is for this reason that the European beet growers association, the Confédération Internationale des Betteraviers Européens (CIBE) in 2013 entered an agreement with sugar producers, the Comité Européen *Des Fabricants De Sucre* (CEFS) and the European Federation of Food, Agriculture and Tourism (EFFAT) sector. The parties formalized an agreement to jointly highlight and report on representative good practices of sustainable production of beet sugar in the EU. The agreement, which sought to consolidate sustainable practices was launched in 2015 and now called the EU Beet Sugar Sustainability Partnership (BSSP) (CIBE, 2015).

The direct payment scheme of the CAP reform also ensures that farmers manage their farm in a sustainable way. This does not apply to the environment alone but also to the public, plant health, animal welfare and the maintenance of all agricultural lands. As of 2010, there were as many as 11 technical institutes conducting research on sugar beet in the EU and promoting good agricultural practices (CIBE-CEFS, 2010). Meeting the standards is therefore, a necessary requirement for beet growers in Belgium and the EU as a whole. Some specific requirements for farmers are:

- Weed, pest and disease control: Low competing ability as well as late closure of the leaves of beets has made weed control obligatory. In Belgium, over twenty main weed species require regular control. Some of these include *Aethusa cynapium*, *Atriplex* spp., *Chamomilla recutita*, *Chenopodium quinoa* etc. Pests such as *Agriotes* spp require control as well.
- Seed preparation: With the development of different varieties of beets, the EU legislation now requires that every variety undergoes official testing for distinctness, uniformity and stability (Rüdelsheim and Smets, 2012).

Additionally, in Belgium, the largest sugar manufacturer, Raffinerie Tirlemontoise also has quality control measures to ensure quality beets and sugars are produced. At the manufacturing level of the factory, there is an annual certification audits known as the International Featured Standards (IFS) for food or the British Retail Consortium (BRC) for food, and the Good Manufacturing Practices (GMP) for animal feed conduct standardization checks. Some of the requirements and standards of these certification bodies translates to the farm level and hence requires farmers' obligation as well. The various standards for beet growers therefore includes the IFS/BRC/GMP standards, the European and other national legislation standards, including the Hazard Analysis and Critical Control Points (HACCP) principles that translates to the farm level.

Concentration at the processing level: The continuous restructuring of the sugar sector, mergers and acquisition between processors mean the number of processing factories have decreased significantly. In most member states of the EU, either one or two companies now control the entire sugar production. The companies are dominated by five multinational groups: *Südzucker*, *Tereos*, *Nordzucker*, *Pfeifer & Langen*, *British Sugar* (Agrosynergie, 2011). Südzucker is the largest producer

among them and it operates about three dozen sugar factories in the Czech Republic, Romania, Austria, Belgium, France, Slovak, Germany and Poland (Maitah et al., 2016). The increased concentration at the processing level implies that the sizes of sugar companies have also increased in terms of equipment such as Information Technology (IT) tools. This has contributed to closures, mergers and acquisition of some of the companies in the process as less efficient firms struggle to survive. This is the situation in Belgium, as can be seen in table A1 (see appendix), where the number of factories has been falling since 1968.

Since the introduction of the regulatory measures specifically the quota in the 60s, processors have been influential in beet purchase. Kross (1957) noted that sugar beet growers in Belgium are paid prices, which are based on the following factors:

- The amount of refined sugar sold by processors on the domestic market and the average wholesale price,
- The average world price paid for refined sugar and the amount exported by the processors,
- The amount of sugar beets delivered to sugar processing plants under or above the quota and,
- The sugar content the beets delivered by growers.

All these factors are determined by the sugar manufacturing association, the *Société Générale des Fabricants de Sucre de Belgique (SGFSB)*. Although these factors have undergone some changes through the evolution of the sugar CMO policies, the changes have not been drastic.

Processors still determines the amount of beet growers that are able to sell to the various factories within the quota through the Sugar Committee before a planting year. The number of manufacturers forming the SGFSB has been declining since 1988 when *Sucrierie-Raffinerie de Donstiennes* was taken over by the *Raffinerie Tirlemontoise*. There were 10 members of the SGFSB before the take over. The number reduced to nine after the take over and presently, the SGFSB comprises of only two manufacturers, *Raffinerie Tirlemontoise* and *Finasucre*. Sugar beet processors, who are the sole buyers of the crop, therefore, remain a duopoly.

With this significant reduction in the number of manufacturers through acquisition and closures, the issue of how influential processors might be comes up. Their influence on prices farmers receive, however, remains unclear with the present regulatory conditions, which guarantees farmers a minimum price for quota beet production. This will change after the termination of the quota regulation in 2017 and the issue of market power may be a concern in the coming years.

In the conducted interviews it became clear that the two different companies have distinct strategies for the year to come. While Iscal Sugar is willing to maintain the current price level, Tiense Suiker wants to reduce the price for sugar beet considerably. Some farmers argue that Tiense Suiker does this also to push competitors out of the market. Thus a price war may emerge.

The termination of the quota system may equip sugar beet farmers with more power as well. So far farmers could not simply shift to another manufacturer due to the quota. However, in the future farmers may become more flexible in this regard. To a certain extent farmers will also get more flexibility regarding their ability to switching to other crops. As soon as manufacturers have difficulties covering the demand, prices for sugar beet will most probably rise. Thus, the ability of Tiense Suiker to reduce prices is limited by farmers' flexibility and willingness to accept low prices.

Farmers groups: Access to market is not a major problem for farmers as long as they produce within their quota limits. Even with out-of-quota production, growers have buyers despite a relatively lower

prices compared to quota beets. However, the continuous reduction in the number of processing factories means that large number growers now face few buyers. The Belgian growers seem to have been reacting to that by formation of farmer group associations through which their harvests are sold. The producer group organization starts from the local groups and centralizes in three regional centers: the Hainaut coordinating committee, the Flanders coordinating committee and the Hesbaya coordinating committee. The committees are based on the three main Belgian sugar beet growing regions. They are responsible for negotiating agreements with the respective sugar refineries and for monitoring a fair allocation of quota for their clienteles (EEC, 1989). They also have co-ordination committees (*Comites de Coordination*) leading to a national body, the Confederation of Belgian Beet Growers (CBB). Another primary role played by the beet growers' association is the control of beet reception operations carried out by the sugar factories such as weight, tare and sugar content determination (Eeckaut, 2001).

Through the associations, farmers are also able to collectively negotiate with processors and have better marketing conditions for their crops. The farmers' associations have grown stronger over the recent years and farmers now sell their beets through their groups. Beet growers in Belgium are therefore concentrating to oligopoly, similar to the processing sector. This constellation presents an interesting case study for bilateral market power analysis. This is more so when the present quota scheme at the sector is due to end in 2017. These dynamics could play important role in the future of beet and sugar production in Belgium.

Although it may seem that the farmers' unions generates a level playing field this is not perceived by all interviewees. In the past when negotiations between farmers' union and factories was mainly about delivery conditions, power imbalances seemed not to matter that much. Now, that the negotiations about prices have started, the inflexibility of Tiense Suiker unravels the limited power of the farmers' union. Indeed it is acknowledged that the farmers' union should create a level playing field among farmers but also between farmers and the factories. However, the termination of the quota systems seems to weaken the farmers' union. A development that is exploited by Tiense Suiker trying to circumvent the farmers' union and making contracts with individual farmers.

Farmer Lars: *"As we can see with Tienen that they try to negotiate individually, and if they negotiate individually, they will agree on different prices for bigger farms than for smaller farms. Therefore it is very important to put everyone on an equal footing with each other and such an organization is a perfect connection between."*

Interviewer: *"The factory does not want to or cannot give you more voice?"*

Farmer Jasper: *"Can give, always, ha. Want to give.... (laughs). That is of course, they would prefer seeing what happens in Tienen now, that they try to go to the farmers individually with their proposals without that being approved by the farmers' union. And the farmers do not really know what they have to do and if they sign, they have signed alone. Without the factory negotiating with the union. So they abuse their power position."*

4.3.5 The future of beet marketing dynamics

The imminent abolition of the quota in 2017 has led to wide speculations over the future of beet sugar production within the EU. Many studies (Benešová, *et al.*, 2015; Cuni, 2015; Davies, *et al.*, 2015) have been predicting possible consequences of the quota elimination. A quota-free market, with less

regulation, would mean that market forces would come to play with the demand and supply factors determining market prices. However, it is clear that beet cultivation has been profit-driven and with lower prices, farmers could switch to growing commodities that are more profitable. This is observed in the 2007/08 season (see figure 4.2) where there was a sharp fall in beet growers due to world food price increases, which possibly made growing other crops more profitable.

Beet growers' decisions will depend on beet prices, alternative crop prices, quality and transparency of contractual agreement with sugar companies as noted by Cuni (2015). This implies that growers would switch to crops that are more profitable with lower beet prices. However, sugar producers could find it difficult switching due to asset fixity. There could be more opportunities for farmers in the future than even processors.

4.4 Key conditions identified in literature, media and interviews

This section concludes the Belgian national report on the sugar beet sector. Following the CSP approach key conditions investigated in literature, interviews and media analysis are synthesized in this section. 7 key conditions were identified and discussed briefly

4.4.1 Unfair competition: Fixed minimum prices distorting the free market

The sugar beet sector is special as production has been regulated by a quota system. This regulation constitutes the main condition for sugar beet farmers. Information gained in the interviews revealed that the quota was partially understood as a restricting factor as farmers could not independently reduce or increase their sugar beet output. On the other hand the quota system provided financial stability for farmers. Although prices had been deteriorating already in the last years farmers still had security about what to expect.

Although the termination of the quota system is not yet operative, it already affects farmers. Depending on farmer's price expectations for sugar beet and the reflection over the deterioration of the milk price within Europe they think about certain strategies to deal with the future situation. We are now at a turning point in the history of sugar beet cultivation regarding the market situation. This report deals with conditions that affect farmers' strategies and performances. Discussing the quota system would lead to an analysis of out-dated strategies, as farmers have to adapt to a changing system by 2017. Nevertheless, it is difficult to say if sugar beet farmers will face perfect market conditions after 2017. Given the high concentration within the sugar beet sector it is rather unlikely. Farmers may have to cope with an oligopsonistic market situation in which prices will most probably also be distorted.

4.4.2 Other conditions affecting farmers

a) Market structure

In Belgium only two sugar manufacturers remained. Under free market conditions this would be of concern regarding the exercise of market power. Since the market is regulated this is not yet a serious

issue. However, this may change considerably after the termination of the quota system. The interviews made clear that there are considerable differences between the two manufacturers, which affect the price farmers receive for their produce. Iscal sugar is a local player which is under Belgian control. Tiense Suiker is part of an international group Südzucker, a German company. German farmers hold a relative great amount of shares of Südzucker. This has the effect that German farmers are interested in keeping the company's profit as high as possible as they also profit from the dividends. In contrast Belgian farmers do not have this source of income. Therefore, their main income regarding sugar beet is gained at the point of sales. While Iscal sugar is willing to maintain a higher price in the post quota era, Tienen does not seem to be willing to do so. Farmers indicated that Tienen wants to push down prices in order to put pressure on Iscal sugar as well. After the quota system terminates factories also plan to increase production up to 30%. Partially farmers already fear that this will lead to an overproduction and thus to plummeting prices.

b) Environmental conditions

Environmental conditions, such as climate or soil properties are optimal in Belgium, making it a favorable country for the sugar beet production. These environmental characteristics of the country build the basis for Belgium's competitiveness within Europa and globally. Nevertheless, all interviewed farmers stated that this year was very bad for the sugar beet cultivation due to excess precipitation. Although none of the farmers stated that there is a trend regarding weather conditions, it is possible that climate change will have an effect on sugar beet cultivation in the future. Even though the weather conditions are favorable in Belgium, they are seen as the biggest risks for the sugar beet cultivation.

c) Land availability

Another major limiting factor for sugar beet cultivation is scarcity of land. Population density in Belgium is high, thus land is expensive making up the highest cost for agricultural production. Although the degree of scarcity varies within the country slightly it is still a condition affecting farmers adversely. One negative effect is that costs for purchasing as well as leasing land are high. Another negative effect is that it is difficult for farmers to expand their business. One farmer stated that the only possibility to expand would be to buy other farms. Moreover, the structure of the plots seems to be less favorable in some areas. Areas coined by urbanization suffer from "verpaarding", which means that parcels are getting smaller making efficient cultivation more difficult.

d) Access to financial capital

Access to financial sources does not seem to be a limiting factor according to farmers. None of the interviewed farmers stated that getting a loan would be restricted, given that the motivation for applying for a loan is reasonable. It was in particular asked if it became more difficult to get a loan since the financial crisis of 2008. Although this is not the case, one farmer stated that it may become more difficult in the future. This statement was related to the termination of the quota system, which may lead to financial problems for sugar beet farmers due to deteriorating sugar beet prices.

e) Perishable crop

After harvest sugar beets need to be processed quickly as they are losing sugar content. In order to reduce this they are covered. New covers (Toptex) were bought to improve the storage of the crop, as the new cover does not only cover the sugar beet but also allows moist to escape. The fact that sugar

beet cannot be stored for a long period without negative effects for the sugar content has the effect that farmers need to get their product processed immediately after harvest. Other crops like corn can be stored. This allows farmers to wait for better prices. Sugar beet farmers in contrast do not have this possibility, which makes them susceptible for price pressure by buyers. Downstream the supply chain it is possible to store the good, which allows processors to sell their product (such as bulk sugar) for better prices.

f) Costs

Transportation of sugar beets represent costs for the farmer. However, these costs cannot be reduced as there is no alternative to transporting the sugar beet a specific factory. Anyway, farmers did not always deliver their crops to the closest factory, due to the quota system. After the quota system has phased out farmers may become more flexible in choosing the factory they are delivering to.

Asking farmers during the interviews what the main costs are, pesticides were listed together with fertilizers, seeds as well as wage work. None of these costs can be reduced further as farmers reduced them already over to the minimum. These high input costs may, however, reduce the competitiveness of Belgian sugar beet.

g) Knowhow

Talking about Belgium's competitiveness within the European as well as the global market, know how was mentioned as another beneficial factor. One farmer particularly emphasized farmers' know how. However, an additional factor are advances in plant breeding that allow the provision of sugar beet varieties that have higher sugar contents.

4.4.3 SWOT analysis

The SWOT analysis is used as an integrative assessment tool, aiming at finding a relation between external and internal conditions. Strengths and weaknesses are internal, opportunities and threats are external conditions that farmers face. In this regard only strengths and weaknesses that are important with respect to the external conditions are integrated (Bell & Rochford, 2016). Therefore the SWOT analysis can be understood as a continuation of the conceptual framework developed for the SUFISA project. The conceptual framework is a further development of Porter's Diamond, where a distinction between external and internal conditions was undertaken. However, Porter did not distinguish between opportunities and threats in the area of external conditions (ibid.). Thus, this SWOT analysis allows gaining a deeper insight into conditions farmers face and thus will allow conducting a well-informed analysis of possible strategies for farmers to profit from opportunities and tackle threats.

Table 4.7: SWOT analysis – the sugar beet sector in Belgium

<p>Strengths</p> <ul style="list-style-type: none"> • Knowhow • Institutional organization 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Reduced importance of farmers' union • Lack of (knowledge about) crop alternatives
<p>Opportunities</p> <ul style="list-style-type: none"> • Termination of quota system (freedom) • Byproducts • Proximity to factories 	<p>Threats</p> <ul style="list-style-type: none"> • Termination of the quota system (price reduction) • Power imbalances (farmer-factory) <ul style="list-style-type: none"> ○ Limited number of buyers

<ul style="list-style-type: none"> • Proximity to export market • Agronomic conditions (e.g. soil properties) and climate 	<ul style="list-style-type: none"> • Lack of access to land • Climate change
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Within the Belgian (as well as in the European) market concentration on the manufacturing level is a matter of concern. Farmers' answer to that threat are farmers' organizations. However, these institutionalization of farmers' interests seem to deteriorate in power. The cause for this deterioration is not only that a certain factory tries to circumvent this institution by making individual contracts. The problem seems to be rooted in farmers' perception of the limited influence and power of the farmers' union. This (perceived) lack of power and influence of the farmers' union makes farmers question the very usefulness of the institution. A process that in turn allows factories to further weaken the institution. Still, the farmers' union is an internal factor. Thus, it is within farmers' realm to developing strategies to strengthen this institution.

The second important strength is farmers' knowledge. Asked about the competitiveness of the Belgian sugar beet farmers, this condition was mentioned together with other external conditions (such as climate). Farmers' knowledge will become even more important under free market conditions, as competition will increase. Other factors regarding competitiveness, such as climate or the costs of production cannot be influenced by farmers. Thus, this is the only possibility for farmers to increase their competitive advantage. It should be mentioned, that indeed costs for production can be reduced. According to farmers all means to do so were already undertaken. Thus, the reduction of input quantities is exploited to its maximum. Prices of inputs cannot be influenced by farmers. The option to also strive for price negotiations with input companies performed by the farmers' union was rejected. Nevertheless, these two points (cost reduction and negotiations with input companies) can be seen as aspects that could be transformed in strengths.

One weakness, the reduction of the importance of the farmers' union was already mentioned. A second is the lack of knowledge about alternative crops. Indeed crop alternatives are limited by the general agronomic conditions as well as by the economic viability of alternatives. However, the interviews made clear that farmers think about alternatives, but that no alternative could be identified. In the advent of plummeting prices for sugar beet the lack of crop alternatives represent a weakness.

What can be seen from the SWOT analysis is that the termination of the quota system is found on both the opportunity and the threat side. Due to the termination of the quota system farmers will have more freedom in choosing how much sugar beet they want to grow. Still, they will not be completely free as now the decision of cultivating sugar beet will be much more influenced by market forces. Moreover the freedom of farmers to choose other crops is limited by the respective agronomic conditions. The effect of the termination of the quota system is not only related to the quantity that can be produced, but also to the price evolution. This is within Belgium highly dependent on the respective factory. Current price suggestions by Tiense Suiker represent a threat to sugar beet farmers as their economic viability would be rendered impossible. This situation remains although the world market price is high. Therefore, a further reduction of the world market price would worsen the situation even further. Interviews reviled evidence that the low price offered by Tiense Suiker is related to the power imbalance on the domestic sugar beet market. Accordingly this power imbalance constitutes another threat.

Similarly environmental conditions can be found on both sides. Climate change represents a threat as more extreme weather events will most probably have adverse effects on the sugar beet production. However, it has to be mentioned, that it is not clear how the general climatic situation will develop. Therefore, the general climatic situation can become better or worse for Belgian sugar beet farmers. Already now the general climatic situation is favorable for sugar beet farmers in Belgium. Accordingly, this constitutes an opportunity. The same applies for the general agronomic conditions, which are favorable in Belgium.

On the threat side the lack of access to land could be identified. The costs for inputs were mentioned already. The costs for land as well as the availability of land are definitively a threat for Belgian sugar beet farmers. The wish to increase production is related to high costs for purchasing or leasing land and limited by the lack of land availability.

There are a couple of opportunities for Belgian sugar beet farmers that could be identified, such as by-products. Nevertheless, the existence of this opportunity is determined by the world market prices of fossil fuel carriers. Developments in this sector will also depend on big players such as Brazil.

The geographic conditions constitute opportunities. The proximity to the factories result in reduced production costs, a clear competitive advantage for Belgian sugar beet farmers. Moreover, the opening of the market may increase exports. Also in this regard proximity to harbors, that again reduce production costs, may contribute to the competitive advantage of the Belgian sugar sector in the future. However, it is not clear who will profit most from these opportunities, the farmers or the factories.

External conditions are conditions that cannot be influenced by farmers but that influence farmers strategies and performance. It is by the internal conditions that farmers can react to the external conditions. Means to actively change external conditions are very limited, as they depend on many other conditions that are outside of the direct sphere of influence of farmers. This is an important observation, as it calls for the action of policymakers to change the conditions that farmers face or support them in the development of strengths. One example of the power of policymakers is the quota system, which was installed and is now abolished by political decision.

4.5 Enabling Resilience: Key Strategies adopted by Producers and their Impact on Performance

This final section discusses strategies adopted by sugar beet farmers, as well as the performances of these strategies. It has to be noted that the sugar beet sector is currently under restructuring due to the phasing out of the quota system. Therefore, strategies taken up so far may change in the next years considerably and an assessment of these new strategies will be necessary.

As mentioned above environmental factors are not a problem for farmers, thus farmers do not need to develop strategies in this regard. Insurances are not taken into consideration as the risk for extreme weather events is too low and the costs for insurances are too high. Spreading the risk along the supply chain is neither an option for farmers. It is not understood to be within the factories responsibility to buffer risks that farmers have to bare. Costs are, however, a problem, since farmers' income has been falling in the last years and may fall considerably after the termination of the quota system. But as farmers are already operating at the limit of cost reduction, they cannot reduce costs further. Anyway,

two interviewed farmers suggested a new insurance system following the example of the United States of America.

So far sugar beet farmers could not reduce their production if the business was not profitable. In the future, however, they may have this possibility. Farmers expressed that if the price will no longer be good enough they may simply switch to another crop. Although this possibility may arise in the future it is also limited. The ability to switch to other crops depends on the region and the therewith connected possibility to produce something else. The limitations also arise, as sugar beet is a crop that improves the soil quality and is thus suitable for crop rotation. Thus, if farmers stop growing sugar beet other crops with similar abilities need to be found.

The main strategy of sugar beet farmers is to organize in farmers' unions. This allows creating a level playing field among farmers as well as between farmers and the factories. The union informs members about novelties, negotiates production standards, audits the delivery and processing of sugar beet and is now also negotiating the minimum price. However, the power of the farmers' union seems to deteriorate as Tiense Suiker tries to make contracts with individual farmers.

It was suggested that one possible solution to price pressures by the factories could be strikes by farmers. However, it was explained to us that this is not an option. If farmers stop delivering sugar beet to certain factories, these factories will have to close down permanently. Consequently, farmers would lose this income source completely.

Using sugar beets to produce non-food goods is not perceived as a possible future strategy by farmers, as they know that this is only possible if sugar beet can compete with fossil fuel prices. This applies for the possible production of bio-ethanol as well as for bio plastics. Apart from this, the pulp can be used for animal feed. Here, similarly, increasing sales is limited by the demand for feed. One farmer stated that in the future there will be rather less than more animal husbandry.

In short farmers' space for applying strategies to improve their income is limited. However, the termination of the quota may open up some more space in this regard.

Regarding the performance of farmers' strategies it can be stated that up until now the system of farmers' unions helped creating a level playing field between farmers and factories. However, so far the minimum price was fixed and only now it will become clear how effective this institution is. From the interviews it can be already observed, that the power of the farmers' union depends on the negotiations partner. Tiense Suiker seems to undermine the power of the farmers' union considerably

Appendix case study B

Table A1: Evolution of some data related to beets and sugar in Belgium

a Imports of beet b Provisional figures d Calculated from the available sugar production quota in and outside Quota

Campaign period	Beet surface area (ha)	Number of growers	Beet yield (tons/ha)	Sugar yield (°Z)	Number of sugar factories	Sugar quota (of white tons)	Beet production (net tons)	Sugar production(white tons)	Sugar yield(tons/ha)	Av. beet price ^d (/t at 16°Z) (EUR)
1968	94.49	36.11	45.90	14.42	22.00	550.00	4337275.00	526480.00	5.57	21.07
1969	95.41	34.66	46.90	15.88	21.00	550.00	4474729.00	618457.00	6.48	20.25
1970	95.07	32.68	43.10	15.82	21.00	550.00	4097431.00	551019.00	5.80	21.07
1971	98.80	31.54	52.30	16.64	21.00	550.00	5167397.00	771965.00	7.81	19.09
1972	105.29	30.49	43.00	15.68	21.00	550.00	4527427.00	616632.00	5.86	21.70
1973	108.63	29.44	50.00	15.45	21.00	550.00	5431500.00	718313.00	6.61	23.10
1974	106.85	27.53	43.40	14.69	21.00	550.00	4637160.00	557971.00	5.22	29.59
1975	121.53	26.86	43.70	15.06	20.00	680.00	5310730.00	658675.00	5.42	29.84
1976a	98.18	23.46	51.10	15.20	18.00	680.00	5017049.00	673703.00	6.86	31.05
1977a	97.60	21.80	49.20	15.96	16.00	680.00	4801723.00	728092.00	7.46	31.60
1978	117.26	22.35	49.40	16.70	16.00	680.00	5792446.00	829613.00	7.08	31.02
1979	123.60	22.42	52.70	16.41	16.00	680.00	6513720.00	913912.00	7.39	30.59
1980	125.51	22.18	47.00	15.74	15.00	680.00	5898782.00	798986.00	6.37	34.73
1981	139.56	22.63	55.20	15.50	15.00	826.00	7703767.00	1030399.00	7.38	32.86
1982	134.25	21.66	63.30	15.30	15.00	826.00	8498025.00	1104993.00	8.23	33.90
1983	115.13	20.82	50.20	15.81	15.00	826.00	5779426.00	781815.00	6.79	44.09
1984	125.56	20.31	50.50	15.16	15.00	826.00	6340831.00	840661.00	6.70	43.55
1985	125.14	19.91	51.80	16.73	14.00	826.00	6482097.00	943618.00	7.54	39.96
1986	118.11	19.40	52.90	16.78	14.00	826.00	6248231.00	937638.00	7.94	40.69
1987	111.40	19.22	55.30	15.10	14.00	826.00	6160365.00	804443.00	7.22	44.10
1988	114.13	18.88	56.30	15.92	12.00	826.00	6425238.00	924979.00	8.10	42.43
1989	110.63	18.43	60.30	15.90	12.00	826.00	6671049.00	956035.00	8.64	45.48
1990	112.48	18.08	61.50	16.59	11.00	826.00	6917459.00	1026859.00	9.13	39.49

1991	105.99	17.68	57.10	16.20	11.00	826.00	6052257.00	891785.00	8.41	43.28
1992	104.95	18.94	58.80	15.88	9.00	826.00	6171001.00	892736.00	8.51	43.28
1993	103.57	18.20	64.30	17.06	9.00	826.00	6659615.00	1043134.00	10.07	38.84
1994	100.99	17.96	56.70	16.54	9.00	826.00	5726133.00	869607.00	8.61	42.01
1995	103.76	17.60	58.70	16.30	9.00	826.00	6090536.00	887806.00	8.56	43.47
1996	103.65	16.52	59.10	17.14	9.00	826.00	6125833.00	953528.00	9.20	41.89
1997	101.36	16.23	64.30	17.20	9.00	826.00	6517127.00	1017792.00	10.04	40.02
1998	96.95	16.09	54.50	16.49	9.00	826.00	5283721.00	793834.00	8.19	45.39
1999	104.72	16.37	67.30	16.94	9.00	826.00	7047656.00	1091175.00	10.42	37.92
2000	94.97	15.49	64.40	16.81	9.00	799.16	6116068.00	941529.00	9.91	41.64
2001	96.21	15.17	56.30	16.85	9.00	819.81	5417304.00	839589.00	8.73	44.02
2002	98.20	14.96	64.90	17.23	9.00	773.40	6367946.00	1018618.00	10.37	39.64
2003	92.50	14.74	67.60	18.14	9.00	808.21	6255775.00	1028626.00	11.12	38.05
2004	89.52	14.68	71.20	17.07	7.00	819.81	6374038.00	990585.00	11.07	37.38
2005	86.62	14.30	69.80	17.28	7.00	726.44	6046146.00	925266.00	10.68	41.06
2006	83.42	13.70	67.00	16.73	6.00	862.08	5585736.00	855771.00	10.26	32.61
2007	85.02	13.00	64.90	17.14	6.00	763.19	5516033.00	875021.00	10.29	28.08
2008	63.89	8.65	68.60	17.82	4.00	676.24	4380024.00	721627.00	11.30	26.43
2009	63.46	8.49	76.60	18.65	3.00	676.24	4860883.00	843158.00	13.29	25.16
2010	59.53	8.20	73.20	17.14	3.00	676.24	4359079.00	689185.00	11.58	28.38
2011	64.36	8.00	81.20	17.79	3.00	676.24	5228044.00	880660.00	13.68	36.25
2012	63.13	7.83	72.60	18.02	3.00	676.24	4585691.00	760371.00	12.04	43.83
2013	61.81	7.70	76.80	17.74	3.00	676.24	4746390.00	783168.00	12.67	31.06
2014	59.78	7.58	85.70	17.19	3.00	676.24	5121524.00	815695.00	13.64	27.15
2015 b	53.69	7.51	82.30	18.02	3.00	676.24	4419843.00	732245.00	13.64	0.00

(Source: CBB)



References

- Algemene Directie Statistiek en Economische Informatie [ADSEI]. (2012). Oppervlakte van de fruitaanplantingen volgens aanplantingsjaren. Retrieved 6/04/2014, 2014
- Annaert B., Avermaete T., Mathijs E. (2014) *GLAMUR WP2 - National level report*. Belgium: KULE.
- Annaert B., Schwarz J., Mathijs E. (2014) "Glamur project: case study on apple supply chains in Belgium." KU Leuven, Belgium.
- Agrosynergie. (2011). *Evaluation of CAP Measures Applied to the Sugar*. [Retrieved from http://ec.europa.eu/agriculture/eval/reports/sugar-2011/fulltext_en.pdf]
- Beleidsdomein Landbouw en Visserij (2014). LARA 2014 - Landbouwrapport. Retrieved from [<http://lv.vlaanderen.be/nl/voorlichting-info/publicaties/studies/sectoren/landbouwrapport-2014>]
- Belgian Foreign Trade Agency. (2016). *Belgian Foreign Trade in 2015*. Brussels: Belgian Foreign Trade Agency.
- Benešová, I., Řezbová, H., & Laputková, A. (2015). European Sugar Market—Impact of Quota System. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 63(6), 1825-1838.
- Bijman, J. & Gijselinckx, C. (2012). Support for Farmers' Cooperatives; Case Study Report; Fruit and Vegetables Cooperatives in The Netherlands and Belgium. Wageningen: Wageningen UR, 27p.
- Boerenbond (2014). Arbeidsreglement. Kenniscentrum Boerenbond [on line]. Available on <https://www.boerenbond.be/kenniscentrum/onderwerpen/ik-moet-personeel-tewerkstellen/arbeidsreglement> [Retrieved on 22/12/2015].
- CBB. (2015). *Confédération des Betteraviers Belges. Statistiques betteravières. Prepared by Daniel Du Ville* [Retrieved from: <http://www.cbb.be/index.php/fr/betteraves-en-belgique>]
- CEFS. (2015). *Comite Europeen Des Fabricants De Sucre. CEFS Statistics, 2015 Release*.
- Ciaian, P., Kancs, A., Swinnen, J., Van Herck, K., and Vranken, L. (2012). Institutional Factors Affecting Agricultural Land Markets. Working Paper. Factor Markets Project: Comparative Analysis of Factor Markets for Agriculture across the Member States, 22p.
- CIBE. (2003). *Confédération Internationale des Betteraviers Européens. Environmental Report* [Retrieved from [http://www.comitesucre.org/userfiles/environ\(5\)\(3\).pdf](http://www.comitesucre.org/userfiles/environ(5)(3).pdf)]
- CIBE. (2015). Confédération Internationale des Betteraviers Européens. The EU Beet Sugar Sustainability Partnership. [Retrieved from <http://www.cibe-europe.eu/sustainability.aspx>]
- Cuni, R. (2015). *Challenges and Opportunities for the EU Beet Growers*.
- Davies, G., Heffernan, C., & Bell, A. (2015). *Modelling the EU cane refining sector after 2017* Defra [Retrieved from <http://www.gov.uk/government/publications>]
- Delombaerde, A. & Lambrechts, G. (2014). Nationale Strategie voor Duurzame Operationele Programma's – Deel 1. Toepassingsjaar 2015-2019. Department of Agriculture & Fisheries, 103p.
- Demeyer, R., De Baets, T., de Schaetzen, C., D'hooghe, J., Keulemans, W., Marchand, F., and Wustenberghs, H. (2013). Duurzame fruitbedrijven: bepalende factoren – indicatoren - hot issues. Flemish government, Department of Agriculture and Fisheries, Monitoring and Studies, Brussels, 173p.
- Department of Agriculture & Fisheries (2013). Voorlichting en Info: Feiten en Cijfers: Landbouwkundige opleiding van de starters in de landbouw [on line]. Available on <http://lv.vlaanderen.be/nl/voorlichting-info/feiten-cijfers/landbouwcijfers#structuur> [Retrieved on 13/12/2015].

Department of Agriculture & Fisheries (2014). Voorlichting en Info: Feiten en Cijfers: Biologische landbouw plantaardige productie [on line]. Available on <http://lv.vlaanderen.be/nl/voorlichting-info/feiten-cijfers/landbouwcijfers#bio> [Retrieved on 22/03/2016].

Department of Agriculture & Fisheries (2015a). De Randvoorwaarden in het Gemeenschappelijk Landbouwbeleid. Voorlichtingsbrochure, 56p.

Department of Agriculture & Fisheries (2015b). Tijdelijke buitengewone crisismaatregelen groenten en fruit. [on line]. Available on <http://lv.vlaanderen.be/nl/landbouwbeleid/landbouwbeleid-eu/crisismaatregelen/tijdelijke-buitengewone-crisismaatregelen> [Retrieved on 16/12/2015].

Department of Agriculture & Fisheries (2015c). Voorlichting en Info: Feiten en Cijfers: Landbouwcijfers. Gewassen (15/12/2015). [on line]. Available on <http://lv.vlaanderen.be/nl/voorlichting-info/feiten-cijfers/landbouwcijfers> [Retrieved on 27/12/2015].

Department of Agriculture & Fisheries (2016a). Voorlichting en Info: Feiten en Cijfers: Landbouwcijfers. Gehele land- en tuinbouw (1/1/2016). [on line]. Available on <http://lv.vlaanderen.be/nl/voorlichting-info/feiten-cijfers/landbouwcijfers>. [Retrieved on 25/01/2016].

Department of Agriculture & Fisheries (2016b). Voorlichting en Info: Feiten en Cijfers: Landbouwcijfers. Tuinbouw (1/1/2016). [on line]. Available on <http://lv.vlaanderen.be/nl/voorlichting-info/feiten-cijfers/landbouwcijfers>. [Retrieved on 20/01/2016].

Department of Agriculture & Fisheries (2016c). VLIF-investeringssteun voor land- en tuinbouwers. [on line]. Available on <http://lv.vlaanderen.be/nl/subsidies/vlif-steun/vlif-investeringssteun-voor-land-en-tuinbouwers> [Retrieved on 02/04/2016].

Deuninck, J., Carels, K., Bas, L., and Van Gijseghe, D. (2007a). Risicobeheersing in de land- en tuinbouw met focus op verzekeringen. Department of Agriculture & Fisheries, 107p.

Deuninck, J., Piessens, I., Van Gijseghe, D. and Carels, K. (2007b). Innovatie in land- en tuinbouw in Vlaanderen: een verkennende nota. Department of Agriculture & Fisheries, Monitoring and studies, Brussels, 49p.

DGO3. (2016). *Evolution de l'économie agricole et horticole de la Wallonie 2014-2015*. [Retrieved from http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/rapport-2014-economie-agricole-wallone.pdf]

EC (2002). Regulation No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety [on line]. Official Journal of the European Union L31: 1-24. Available on <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:031:0001:0024:en:PDF> [Retrieved on 05/04/2016].

EC (2007). Regulation No 1234/2007 of 22 October 2007 establishing a common organization of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation [on line]. Official Journal of the European Union L299: 1-149. Available on <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32007R1234> [Retrieved on 22/02/2016]

EC (2009a). Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (1) [on line]. Official Journal of the European Union L309: 71-86. Available on <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2009:309:TOC> [Retrieved on 05/04/2016].

EC (2009b). Regulation No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC [on line]. Official Journal of the European Union L309: 1-50. Available on <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32009R1107> [Retrieved on 05/04/2016].

EC (2011). Regulation No 543/2011 of June 2011 laying down detailed rules for the for the application of Council Regulation (EC) No 1234/2007 in respect of the fruit and vegetables and processed fruit and vegetables sectors [on line]. Official Journal of the European Union L157: 1-163. Available on <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=OJ%3AL%3A2011%3A157%3ATOC> [Retrieved on 05/04/2016].

- EC. (2016). European Commission-Agriculture and Rural Development. *The EU Sugar Sector*.
- EEC. (1989). Commission Decision of 19 December 1989 relating to a proceeding under Article 85 of the EEC Treaty (IV/32.414 - Sugar beet) [Press release]
- Eeckaut, R. (2001). *Sugar beet production and its organisation in Belgium*. Paper presented at the Comptes-Rendus des Congres de l'Institut International de Recherches Betteravieres (Belgium).
- European Commission (2015). Belgium – Rural Development Programme (Regional) – Flanders. The European Agricultural Fund for Rural Development, 638p.
- EUROSTAT. (2016). *Selling prices of sugar beet (unit value) (tag00064)* [Retrieved from: <http://ec.europa.eu/Eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tag00064&plugin=1>]
- EUROSTAT. (2015). The Agriculture, forestry and fishery statistical book. [Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Organic_farming_statistics]
- EUROSTAT. (2016). Maritime ports freight and passenger statistics. [Retrieved from http://ec.europa.eu/eurostat/statisticsexplained/index.php/Maritime_ports_freight_and_passenger_statistics]
- FAOSTAT. (2016). FAOSTAT [Retrieved from <http://faostat3.fao.org/download/Q/QV/E> on July 10, 2016]
- FASFC (2015). Voedselveiligheid in de Europese Unie [on line]. Available on <http://www.favv-afsc.fgov.be/europeseunie/> [Retrieved on 15/12/2015]
- FEVIA - Fédération de l'industrie alimentaire asbl (2013). Evolution Economique de l'Industrie Alimentaire Belge en 2013 [Retrieved from http://www.gondola.be/sites/default/files/public_download_files/fevia_rapportecon2013_fr.pdf]
- Flemish Department of Agriculture and Fisheries. (2016). *De Vlaamse Landbouwconjunctuurindex - resultaten enquête voorjaar 2016*. Flemish Department of Agriculture and Fisheries.
- Flemish government (2016). Vraag om uitleg over de actuele situatie in de fruitteelt, van Lydia Peeters aan minister Joke Schauvliege (3/4/2016) [on line]. Commissie voor Landbouw, Visserij en Plattelandsbeleid. Available on <https://www.vlaamsparlement.be/commissies/commissievergaderingen/1048183/verslag/1049815> [Retrieved on 18/04/2016].
- FOD WASO (2015). Paritair Comité voor het tuinbouwbedrijf (PC 145). FOD Werkgelegenheid, Arbeid en Sociaal Overleg, 24p.
- FOD-Economie. (2015). Impact van de Russische boycot op de prijzen en de uitvoer van bepaalde landbouwproducten. FOD Economie, K.M.O., Middenstand en Energie - Algemene Directie Economische Analyses en Internationale Economie - Dienst Sector- en Marktmonitoring
- FOD-Economie. (2016). *ANALYSE VAN DE MARKTWERKING IN DE SUIKERKOLOM*. [Retrieved from http://economie.fgov.be/nl/binaries/Analyse-marktwerking-suikerkolom_tcm325-280084.pdf]
- FOD-Economie. (2016) Algemene Directie Statistiek en Economische Informatie [Retrieved from <http://statbel.fgov.be/nl/statistieken/cijfers/economie/landbouw/>]
- Gijselinckx, C., & M. Bussels (2012). Support for Farmers' Cooperatives; Country Report Belgium. Wageningen: Wageningen UR, 67p.
- GLOBALG.A.P. (2016). GLOBALG.A.P. Fruit & Vegetables Certification. Information folder [on line]. Update March 2016. Available on http://www.globalgap.org/export/sites/default/.content/.galleries/documents/160404_Fruit_and_Vegetables_Booklet_en.pdf
- Hobbs, J.E. (2010). Public and Private Standards for Food Safety and Quality: International Trade Implications. The Estey Center Journal of International Law and Trade Policy, vol.11(1): 136-152.
- KBC (2005). De Pachtwet [on line]. 48p. Available on https://kbc-pdf.kbc.be/lfb/pachtwet_N.pdf [Retrieved on 23/11/2015].
- Kross, J. I. (1957). Pricing Sugar Beets in Belgium. *Journal of Farm Economics*, 39(1), 168-169.

- Lambrechts, G. (2013). Handelsverkeer met derde landen voor groenten en fruit. Een verkenning van de EU procedures. Department of Agriculture & Fisheries, 17p.
- Lambrechts, G. (2014). Nationale Strategie voor Operationele Programma's, Deel 2. Toepassingsjaar 2015. Department of Agriculture & Fisheries, 27p.
- LEGRAND, G., BLOCAILLE, S., EIGNER, H., EKELÖF, J., HOFFMANN, C., LEIJDEKKERS, M., & STRIEBIG, J.-L. (2016). RECOMMENDATIONS FOR BEET STORAGE TRIALS UNDER CONTROLLED CONDITIONS.
- Lynch, B. (2010). Apples: Industry & Trade Summary. United States International Trade Commission, 55p.
- Maitah, M., Řezbová, H., Smutka, L., & Tomšík, K. (2016). European Sugar Production and its Control in the World Market. *Sugar Tech*, 18(3), 236-241.
- Massot, A. & Ragonnaud, G. (2016). The CAP After 2013 [on line]. European Parliament, Fact Sheets on the European Union – 2016. 4p. Available on http://www.europarl.europa.eu/ftu/pdf/en/FTU_5.2.9.pdf [Retrieved on 01/02/2016].
- McDonald, S. (1996). Reform of the EU's Sugar Policies and the ACP Countries. *Development Policy Review*, 14(2), 131-150.
- Peeters, A. (2010). Country Pasture/Forage Resource Profiles. *Women*, 10, 558.
- Platteau, J., Van Gijsegem, D., and Van Bogaert, T. (2014). Landbouwrapport 2014. Department of Agriculture & Fisheries, Brussels, 321p.
- Polet, Y. (2015). *Annual Sugar Report on EU-28 by Global Agricultural Information Network Report's (GAIN)* [Retrieved from [http://gain.fas.usda.gov/Recent GAIN Publications/Sugar Annual Brussels USEU EU-28 4-17-2015.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Sugar%20Annual%20Brussels%20USEU%20EU-28%204-17-2015.pdf)]
- Rüdelshheim, P., & Smets, G. (2012). Baseline information on agricultural practices in the EU Soybean (*Glycine max* (L.) Merr.). *Perseus BVBA*, 42.
- Samborski, V. & Van Belleghem, L. (2016). De Biologische Landbouw in Vlaanderen. Stand van zaken 2015. Department of Agriculture & Fisheries, Brussels, 43p.
- SPF Economie. (2016, august 8). *statbel.fgov.be*. [Retrieved from statbel.fgov.be: <http://statbel.fgov.be>]
- Statbel (2013). Landbouw - Oppervlakte van de Fruitaanplantingen volgens aanplantingsjaren, 2012 [on line]. Available on [http://statbel.fgov.be/nl/modules/publications/statistiques/economie/downloads/agriculture - superficie des plantations fruitieres.jsp](http://statbel.fgov.be/nl/modules/publications/statistiques/economie/downloads/agriculture_-_superficie_des_plantations_fruitieres.jsp) [Retrieved on 20/10/2015].
- Statbel (2016). Chiffres Clés de l'Agriculture - L'Agriculture en Belgique en Chiffres 2016. [Retrieved on http://statbel.fgov.be/fr/binaries/FR_Kerncijfers%20landbouw_2016_Web_tcm326-279479.pdf].
- Szajner, P., Wieliczko, B., Wigier, W., Hamulczuk, M., & Wrzaszcz, W. (2016). *The Post-Quotas EU Sugar Sector-Research for Agri Committee*
- Tüv Nord (2014). Geïntegreerde teelt van pitfruit en Fruitnet [on line]. Available on <http://www.tuv-nord.com/be/nl/belgische-gap-certificatiesystemen/fruitnet-464.htm> [Retrieved on 05/01/2016].
- Van Bogaert, T., Bernaerts, E., and Platteau, J. (2012). Bedrijfskolom tuinbouw. Department of Agriculture & Fisheries, Monitoring and Studies, 30p.
- VBT (2013). Duurzaamheidsrapport Responsibly Fresh 2012-2013, 40p.
- VBT (2015). Jaarverslag 2014. P. Appeltans – Tiensevest 136 – 3000 Leuven, 48p.
- Vegaplan (2015). Vegaplan Standaard voor de Primaire Plantaardige Productie, versie 2.0, 02.09.2015, OVPG vzw – AGROFRONT, 185p.
- Vervloet, D., Vuylsteke, A. and J. Deuninck. (2015). GROENTE- EN FRUITTELLERS EN PRODUCENTENORGANISATIES: NIET IN ÉÉN VERHAAL TE VATTEN. Department Landbouw en Visserij
- Vilt (2014d). Fruitsector bewerkt bestaande markten en verkent nieuwe [on line]. Available on <http://www.vilt.be/fruitsector-bewerkt-bestaande-markten-en-verkent-nieuwe> [Retrieved on 22/01/2015].

Vilt (2015b). Veiling Haspengouw slaat met UNIVeG een nieuwe weg in [on line]. Available on <http://www.vilt.be/veiling-haspengouw-slaat-samen-met-univeg-nieuwe-weg-in> [Retrieved on 03/03/2016].

VLAM (2015). Belgisch thuisverbruik van groenten en fruit [on line]. Available on <http://www.vlam.be/nl/feitenencijfers/groenten-en-fruit>. [Retrieved on 20/11/2015].

VLIF (2015). VLIF activiteitenverslag 2014. Department of Agriculture & Fisheries, 37p.

X100 report (2016). X100 roadmapping Limburgse Groente- en Fruitsectoren. Kempische steenweg 305, 3500 Hasselt, Innovatiecentrum Limburg vzw, 50p.

Annex: sources of media analysis

20060114_De-Standaard_p-64_Een-welgemeend-suskewiet-aan-de-rituele-slachting
20060117_De-Standaard_p-19_Belgische-melkquota-raken-niet-volgemolken
20060118_Het-Nieuwsblad-Limburg_p-18_-Belgie-is-er-klaar-voor-de-overheid-niet-
20060306_De-Tijd_p-5_-Afrikaanse-regeringen-verwaarlozen-landbouw-verschrikkelijk-
20060314_Het-Nieuwsblad_p-4_We-betalen-ons-blauw
20060801_De-Morgen_p-99_Amerikaans-maismeel-in-Congo
20060805_De-Standaard_p-31_Over-het-hiernaamaals-spreek-ik-niet-meer
20061114_De-Tijd_p-17_Over-zin-en-onzin-van-ontwikkelingshulp
20070213_Gazet-van-Antwerpen-Waasland_p-17_Oxfam-zoekt-tweehonderd-kussende-koppels
20070215_De-Standaard_p-21_Lage-prijzen-eisen-hoge-tol
20070215_De-Standaard_p-29_Laat-het-water-maar-komen
20070215_Het-Laatste-Nieuws-Waasland_p-15_Valentijnskussen-voor-duurzame-supermarkten
20070215_Het-Nieuwsblad_p-77_Hou-het-water-niet-tegen
20070315_De-Standaard_p-16_-De-Congolezen-moeten-profileren-van-de-mijncontracten-
20070414_De-Tijd_p-1_-Als-je-de-overheid-overleeft-overleef-je-alles-
20070505_De-Standaard_p-26_-De-Boerenbond-is-meerdan-landbouw-
20070514_De-Morgen_p-22_-Blij-dat-ik-in-Europa-geen-echte-hits-heb-
20070618_De-Standaard_p-15_-Achteraf-krijgt-alles-een-etnisch-sausje-
20070922_Gazet-van-Antwerpen_p-19_Vrouw-draagt-gewicht-van-de-hele-familie
20070922_Het-Belang-van-Limburg_p-26_7Vrouw-draagt-gewicht-van-hele-familie
20071115_Het-Belang-van-Limburg_p-15_7Herontdek-smaak-van-ingredienten
20071208_Gazet-van-Antwerpen_p-85_Dichte-mist-rond-Scheldeverdragen
20080308_De-Morgen_p-10_-Wij-zullen-lobbyen-voor-elke-morzel-grond-
20080308_Gazet-van-Antwerpen_p-12_Landbouw-is-weer-sexy
20080414_De-Standaard_p-8_-Ik-streef-niet-naar-de-absolute-macht-
20080419_De-Tijd_p-6_Rwanda-s-grote-sprong-voorwaarts
20080517_De-Tijd_p-2_De-voedselcrisis-is-niets-om-mee-te-lachen-
20080603_De-Tijd_p-18_Pleidooi-voor-een-nieuwe-landbouwrevolutie
20080606_De-Standaard_p-61_SCHULDIG-VERZUIM
20080618_Het-Nieuwsblad_p-18_-Werk-gewoon-door-zonder-anderen-te-pestent-
20080920_De-Standaard_p-62_Als-de-roebels-rollen
20081010_De-Standaard_p-78_De-staat-heeft-het-gedaan
20090128_De-Standaard_p-16_-Rwanda-is-vulkaan-met-stop-erop-
20090321_De-Morgen_p-8_Ex-premier-verbreekt-na-een-jaar-het-stilzwijgen-en-is-klaar-voor-nog-maar-ee
20090324_De-Tijd_p-1_IN-HET-NIEUWS-Motie-van-wantrouwen-tegen-EU-voorzitter-
20090516_Het-Belang-van-Limburg_p-27_Met-de-PS-zal-Wallonie-nooit-veranderen
20091010_De-Standaard_p-36_-Mijn-boerenzijnvrij-
20091010_De-Tijd_p-45_-De-dagen-van-de-conventionele-energie-zijn-geteld-De-Europese-AI-Gore-wordt-h
20091020_De-Tijd_p-10_Melkboeren-krijgen-laatste-Europese-geld
20091029_Het-Belang-van-Limburg_p-13_EU-pakt-hoge-voedselprijzen-aan
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