

Cooperatives adapting to market conditions: insights from a comparative study of apple and pear farming in Poland, Italy and Belgium

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Abstract: *Even if characterised as dynamic and highly innovative, European apple and pear farmers have experienced serious structural challenges in the last decade with respect to the marketing of their produce. Stressors such as the consistent oversupply of apples and the globalisation of the apple and pear markets have affected these farmers, as did the Russian embargo on EU imports. By means of three case studies, conducted in Poland, Italy and Belgium, we assess how these market conditions have forced apple and pear farmers to target their production towards specific markets, and how marketing cooperatives have adjusted the functions they perform accordingly. We argue that the range of functions currently performed by cooperatives is likely to influence farmers’ strategies for the future. In addition, we point at lessons taught by the development of the Belgian marketing cooperatives in the last two decades, as Polish and Italian stakeholders appear to strive for a similar development of the cooperatives in their regions.*

Keywords: *cooperative, producer organisations, marketing, collective, apple, pear, fruit*

1. Introduction

Traditionally, the function of marketing cooperatives is to aggregate the produce of individual farmers. This allows for lower transaction costs of downstream supply chain actors and provides some certainty on demand to farmers. In order to fulfil this function, marketing cooperatives generally deal with auction sale, administration, quality control and logistics (Gijssels and Bussels, 2012). Since the early years 2000 it has been observed in the Netherlands and Belgium that the role of marketing cooperatives has expanded to mediation for bilateral agreements between producers and final buyers, support for production planning, marketing and innovation, and wholesaling, including importing and exporting (Bijman and Hendrikse, 2003; Gijssels and Bussels, 2012). These cooperatives have thus integrated some functions of their former downstream trading partners. In a comparative analysis of apple and pear (A&P) marketing cooperatives in Poland, Italy and Belgium, we have discovered that the extent to which cooperatives have integrated these functions varies strongly across countries. The aim of this paper is to illustrate how the adjustment of the functions performed by marketing cooperatives in the three different regions is associated

with the specialisation of regional farmers towards certain market segments, and how the latter is driven by the conditions in which these cooperatives operate.

The paper unfolds as follows: firstly, A&P farming in Europe is introduced, followed by a short description of the case studies. Secondly, the methodology that was used to collect data is briefly discussed. Section 3 describes the results, which are the key market conditions for A&P farming identified, an illustration of the importance of cooperatives in the three case study regions, and an overview of the functions performed by cooperatives in the three case study regions. In the fourth section, we discuss the implications of the adjustment of the functions performed by cooperatives, and point at some lessons learnt from the historical development of cooperatives in Belgium that should be taken into account in Polish and Italian cooperatives' development plans.

2. Data and methodology

2.1. Case study description

Apple and pear production are treated jointly because they are highly similar products (tree fruits), marketed in highly similar supply chain arrangements. Tree fruit farming is highly different from other agricultural activities that do not involve the cultivation of trees. Infrastructure and machines are generally specifically developed for tree fruit farming. Consequently, the majority of tree fruit farmers is specialised in this type of production. Besides the physical specificity of tree fruit farming, its time horizon is very different from other agricultural activities. Apple trees are normally retained in production for 10 to 14 years, whereas pear trees can be retained up to 25 years. Tree fruit farmers face high investment costs when planting orchards, as young trees have to be purchased from nurseries and the installation of orchards requires a lot of time. After the initial investment, trees have to be maintained for at least three years before they start to produce apples or pears. Only after many years, the costs of the initial investment and continuous maintenance of an orchard are paid back by its yields. In other words, A&P farmers face very high adjustment costs, which causes them to be slow in adopting new cultivars or crops following changes in the demand for A&P.

The sectors of A&P have, just as any type of fruits and vegetables, always been rather highly liberalised sectors, being subject to little market intervention in the framework of the European Common Agricultural Policy (CAP). The sector never received high levels of pillar I subsidies (direct payments). The support for fruit and vegetable producers instead consisted of subsidies for Producer Organisations (POs) in the framework of the Common Market Organization (CMO), aiming at increasing producers' bargaining power by allowing them to aggregate supply and to coordinate production. POs can be either producers' cooperatives or private companies. POs and their associated forms continue to be the core instrument of the EU support for the sector, having the intention to improve the position of producers in the market, thereby enhancing profitability and efficiency, as well as achieving a better redistribution of value in the supply chain (AMTF, 2016).

The three case studies are conducted in three key production regions of countries where the apple and pear (A&P) sectors are important agricultural sectors: Malopolska in Poland, Emilia-Romagna in Italy and Flanders in Belgium. Poland is the EU's largest producer of apples, with a production of 3.6 million tonnes in 2016 (Eurostat, 2017). Apples, in the form of either dessert apples or processed products, are Poland's number one agricultural export product. Pear production is only a minor activity: the production was only 69,000 tonnes in 2015 (EC, 2016). The short growing season makes the country not well suited for the production of many pear varieties. It has the highest agricultural population in the EU-28, and in terms of the total number of agricultural farms it holds the second position after Romania. Fruit farms in Poland are significantly smaller than in Belgium and Italy. About 83% of farms are smaller than 5 ha, and only 3.1% of them occupy more than 15 ha. However, average farm sizes are increasing constantly. It is worth noting that Poland has the largest number of

young farmers among all EU countries, although there are concerns that the average age is increasing (Gorlach et al., 2017).

The case study chosen for Poland is apple farming in the region of Malopolska. This region has been one of the biggest producers of fruit as well as vegetables in the country and yet, the region is typified by small family farms. Two different apple farming systems prevail: traditional farming on rather small acreages, making use of traditional techniques, and entrepreneurial farming on larger acreages, involving much larger investment and production costs. Traditional farming is practiced at either small scale, family farms or by part-time farmers who have professional activities besides farming. On paper, family farms in the region use family labour almost exclusively (> 99%, Gorlach et al., 2017). However, in personal interviews it became clear that during the harvest time some farmers hire extra workers through informal procedures.

Italy is the second largest apple producer in the EU, following Poland closely with 2.4 million tonnes of apples produced in 2016 (Eurostat, 2017). For pears, the country is the number one producer in the EU with 754,000 tonnes produced in 2015 (EC, 2016). Apple farmers are concentrated in the northern Trentino region whereas pear production is concentrated in Emilia-Romagna. Just as in Poland, climatic reasons largely explain this strong specialisation. Despite the high production volumes, the prevailing management model in Italy is the family farm. According to 2010 General Agricultural Census, family farms represent 98.9% of all farms, cultivating 89.4% of the total utilisable agricultural area (UAA). More than 50% of these farms own less than 2 hectares; they cultivate only 6% of the total UAA. However, the number of Italian farmers is decreasing at high speed, and consequently average acreage per farm is increasing as well (Minarelli et al., 2017).

The case study chosen in Italy is pear farming in the Emilia-Romagna region. This region is the traditional centre of pear production of Italy: of the 33,000 hectares of pear plantations found in Italy today, 19,000 are located within this region (Pirazzoli, 2017). Tree fruit production is the second largest type of agricultural production in the region in terms of acreage, after cereal farming. Given the highly (capital) intensive character of tree fruit production, this indicates a very strong specialisation of farmers in the production of pear. Farms in the Emilia-Romagna region are much larger on average than Italian farms in general (Emilia-Romagna farms are only 4.5% in number but account for 8.3% of the Italian acreage; Minarelli et al., 2017). Yet, pear farming in Emilia-Romagna is on the return: the pear acreage has declined from 27,000 hectares in the late nineties to 19,000 hectares today. Just as in Poland, nearly all farms (96%) are owner-run (Minarelli et al., 2017).

In Belgium, apple production has always been intertwined with pear production, and the amount of production of both fruits was similar. The Belgian climate is suitable to both apple and pear production, and therefore farmers traditionally combined the production of both types of fruit. On the European level, however, the country is a very small producer of apples (233,000 tonnes produced in 2016; Eurostat, 2017), while it is the second largest pear producer (375,000 tonnes produced in 2015; EC, 2016). The contribution of agriculture to Belgian GDP lowers consistently, and is below 1% since 2015 (Avermaete et al., 2017). Fruit production makes up for 7.6% of the total Flemish agricultural production value. Apple (42%) and pear (51%) are the major fruits produced in Flanders, in terms of production volumes (Platteau et al., 2016). The main trend characterizing the Belgian agricultural sector is the structural decline in the number of farms and the concentration of land. 68% of all farms has disappeared since 1980 while the land area of the average farm has tripled (Statbel, 2016). In the case of Flanders, the average farm size has risen from 17.9 ha in 2004 to 25.0 ha in 2013 (Department of Agriculture and Fisheries, 2014). The labour share associated to agricultural activities is characterized by a similar contraction.

The Belgian case study treats A&P production in Flanders jointly, as they have traditionally been combined. Flemish firms account for 92.8% of the Belgian acreage of A&P (Van der Straeten, 2016). Therefore, findings regarding A&P farming in Flanders will often be generalised to Belgium. Generally, statistics indicate that Flemish farmers are very innovative (Department of Agriculture and Fisheries, 2014). There is a concentration of production in the hands of highly capitalized farms, owned by high-skilled and innovative farmers. Flemish

farms are generally highly productive. For example, Conférence pear yields have been fluctuating between 30 and 44 tonnes per hectare over the last years, whereas they average 25 tonnes per hectare in Emilia-Romagna (Van der Straeten, 2016; Pirazzoli, 2017).

2.2. Data collection

In the three case studies, a similar methodology was followed. First, a media analysis was conducted (which covered national, regional and specialised media from 2006 to 2016), as well as a desk-based analysis of market conditions and regulations (sources reviewed included: academic publications; government and policy documents; market research and consultancy reports; industry reports and NGO documents).

Second, the perspective of farmers themselves on the functioning of their sectors was investigated in interviews and focus groups. In Poland and Belgium, this second phase of the study consisted of two focus groups with A&P farmers, followed by a participatory workshop composed of key stakeholders from the sectors. All of these workshops were organised in March, April and May 2017. The stakeholders who participated in the second type of workshops represented farmers' cooperatives, farmer unions, retailers, private wholesalers of A&P, governmental bodies, and more. The aim of this participatory workshop was to (1) "ground truth" the findings of the research so far and (2) incorporate the perspectives of the different types of stakeholders there represented. In Italy, a similar participatory workshop was complemented with a questionnaire distributed at a local, large exposition on fruit production called "Macfrut", on May 11th 2017 in Rimini. Twenty questionnaires were collected, of which eight were filled out by farmers.

Third, similar surveys were conducted on apple producers in Malopolska, Poland (N=200), pear producers in Emilia-Romagna, Italy (N=105) and producers of apple and pear in Flanders, Belgium (N=137). The structure of the questionnaire for this survey is based on the SUFISA framework, and is maintained in all surveys. Due to the timing of the surveys, only a limited number of results are discussed in this paper.

3. Results

3.1 Key market conditions for apple and pear farming in Belgium, Italy and Poland

A key condition which A&P farmers face, is the persistent oversupply on the world market of apples. A steep increase of apple production in China seems to be the major cause for this (Avermaete et al., 2017). Locally, consumption levels of apple have been decreasing in Belgium and Italy due to substitution of apples by exotic fruits. In addition, Belgian and Italian producers have a similar problem: the traditional Belgian Jonagold apple and the traditional pear cultivars from the Emilia-Romagna region seem to have lost the preference of consumers, especially young consumers. This is for example reflected in the continuously increasing market share of the Pink Lady apple at the expense of Jonagold in Belgium. Shifting to new cultivars, more suited to today's customers' preferences, could be a way to overcome this problem. The nature of A&P farming as tree crops, however, poses a significant barrier to do so. Shifting to new cultivars means re-planting orchards, which is very expensive, and delays harvesting and thus income generation for at least three years, when the young trees start to produce fruit again. In the focus groups, farmers strongly stated not to be willing to take the risk of planting new cultivars, as it is highly uncertain that a given new cultivar will attract the interest of consumers and conquer a significant market share.

Oversupply on the world market affects European A&P growers as these operate in one of the most liberalised, open EU agricultural markets. Indeed, one can easily find A&P produced in the Southern hemisphere in European supermarkets today, and A&P from Belgium, Italy as well as Poland are exported to overseas markets. The very low perishability of A&P as compared to other fruit and vegetables facilitates this worldwide trade. Moreover, technological advances have enabled the storage of A&P up to one year (in a controlled

environment). As a result, A&P are now available throughout the year in Europe, benefitting from both the year-round supply by EU producers as well as imports from regions with countercyclical production seasons (i.e. in the Southern hemisphere). International competition (understood as competition for A&P growers of a specific country from both other EU and non-EU countries) has also been facilitated by the introduction of marketing standards. These standards, introduced by the European Commission, provide transparency on the required quality, size, tolerances, packaging, etc., that fruits and vegetables have to meet in order to be granted access to the European market (De Lacroix, 2003). Transparent standards allow for codification: producers from within or outside the EU can adapt the production process in a way that guarantees access to the EU market. The EU is in fact a true single market for fruit and vegetables (F&V): once granted access, A&P can be traded within the EU without any formal barriers.

As a result from both oversupply and increased exposure towards international competition, A&P producers in Belgium, Italy and Poland have been forced to adapt their production systems in order to achieve a competitive advantage over other production regions. This is reflected for example in the choice of crops: Belgian farmers are abandoning apple farming on a large scale, in favour of the production of *Conférence* pears. They do so because they face much higher production costs than for example their Polish peers, who produce apples of similar quality. *Conférence* pears however are sold at much higher prices on the world market, and require specific climatic conditions that align well with the Belgian climate. This competitive advantage of Belgian pear farmers has incentivised them to export 80% of all pears produced, and strongly specialise in *Conférence* production (which represents 87% of the pear acreage). In Italy, pear farmers have specialised over the last 20 years in the production of *Abaté Fétel* pears, a variety appreciated especially by Italian consumers but not well suited for export (Pirazzoli, 2017). The *Abaté Fétel* pear is not suitable for production in the North-West of Europe. In Poland, apple farming is booming. The country overtook China as the world's largest exporter of apples in 2013 (The News Poland, 2014).

Last but not least, the Russian embargo on EU F&V, installed in August 2014, caused a major shock on the EU market of A&P. The Russian embargo, still in place, forbids all export of A&P to Russia. Polish and Belgian A&P farmers were severely affected, as Russia was a major export market for Polish apples and Belgian pears. Following the embargo, prices of apples dropped both in Poland (-13% for dessert apples and -44% for processing apples) and Belgium (around -40% for dessert apples) (Nosecka, 2016; VBT, 2015). Prices of Belgian pears dropped by around 40%, with large differences between different varieties (VBT, 2015). The price drop of apples in Belgium appears to be caused largely by an influx of Polish apples that were exported to Russia in the previous years (Avermaete et al., 2017). Malopolska apple producers faced a similar situation: apples grown in the area around Warsaw, intended for export to Russia, were distributed freely by the Polish state in Malopolska Province. This disturbed the apple market in Malopolska (Gorlach et al., 2017). Italian pear farmers have suffered much less from the Russian embargo. *Abate Fétel* pears were mainly exported to Germany and other neighbouring countries, while Russia was only a minor export market. Moreover, the sudden oversupply of *Conférence* pears in 2014 seems to have had a limited effect on *Abaté Fétel* sales.

3.2 Importance of cooperatives in the case study sectors in Belgium, Italy and Poland

In the three case study regions, cooperatives play an important role in the marketing of apple and pear. In the Belgian case study region Flanders, 84% of the farmers surveyed is member of a cooperative (the only prevailing collective sales arrangement). This figure is in line with the one reported by Gijssels and Bussels (2012), and is one of the highest found in the EU. Two types of cooperatives can be distinguished: traditional auction-based cooperatives and new cooperatives. The former have over 1000 members, while the latter have less than 100. Auction-based cooperatives have dominated the marketing of F&V in Belgium since the 1960's (Bijman and Hendrikse, 2003; Gijssels and Bussels, 2012). In the last two decades, the number of auction-based cooperatives has been steadily declining due to subsequent mergers, up to the point where only two independent traditional cooperatives

remain today. These hold over 65% of the Belgian A&P farmers. This concentration at the level of cooperatives was not the least a reaction to the ever increasing concentration of market shares at the retail level. In 2015, the combined Belgian market shares of the three largest food retail companies were 68% (Gondola Retail Facts & Trends, 2016). With the scale enlargement of the cooperatives came management difficulties: it is a widespread concern of members that their voice is not being heard by the management of their cooperative. Besides these traditional cooperatives, new cooperatives have been founded by A&P traders in the last two decades. The growing discontent among members of the traditional cooperatives with the way these were managed provided the opportunity to do so. Two of these new cooperatives are still standing today. In the remainder of this paper, these two different cooperative models will be described as traditional cooperatives and new cooperatives.

In the Polish case study region Malopolska, 22.5% of the farmers surveyed sells apples to a cooperative, and 31.5% sells to a Producer Group (PG). The total number of surveyed farmers selling in collective arrangements is 48%. PGs generally consist of a small number of farmers (mostly less than ten) who join forces for the marketing towards – often international – multiple stage value chains. PGs, which can be either cooperatives or private companies, enjoy similar benefits as Producer Organisations under the EU's CMO. They are considered as lighter forms of POs, preferably transforming into the latter at a later stage (DG AGRI, 2017). The Polish PGs are perceived to be dynamic organisations by stakeholders. Polish cooperatives generally produce for the domestic market. The cooperatives are associated with quite the opposite dynamics as PGs: as most of them originate from before the early '90s transition period (from a state led agricultural sector to a free market), they are often thought to suffer from the same problems as the state led cooperatives did. Some part of the Polish population, including farmers, feels a deeply rooted distrust towards these cooperatives, due to their pre-transition history. Just as in the Belgian case, interviewed stakeholders pointed at management problems in the cooperatives.

In the Italian case study region Emilia-Romagna, 48% of the farmers surveyed is member of a cooperative. This figure is in line with the one reported by Bono (2012) for the entire F&V sector. The number of farmers who are member of a PO which is not a cooperative is very limited. Therefore, the importance of this type of marketing arrangement is expected to be very limited, in terms of numbers, and we only refer to the cooperatives in the remainder of this paper. As the region holds eighteen cooperatives which market pear, we can conclude that these cooperatives are rather small. Indeed, the fragmentation of the sector was mentioned by stakeholders to be a major weakness of the sector. Stakeholders generally expect that product quality and the cost efficiency of the pear supply chain could be improved by increasing the cooperatives' scale of operations. In addition, the formation of Associations of Producer Organisations, a model introduced in the 2013 CAP reform, is expected to improve the aggregation of supply and the targeting of F&V production in the sector (i.e. adjustment of product diversity and quality; Minarelli et al., 2017).

3.3 Functions of cooperatives identified in the three case studies

The marketing cooperatives encountered in the three case studies share two key characteristics: their primary rationale, which is the need of individual farmers to collaborate for the marketing of their produce, and their compliance to the Producer Organisations (POs) framework of the EU's CMO for F&V. POs hold a specific legal status, and are given specific benefits such as derogation from some EU competition rules. Moreover, POs receive financial support for actions that help them to align with the member states' National Strategies in the framework of the CMO. These actions are subsidised at a 50% rate. Financial supports are capped however at 4.1% of the POs' turnover. Stakeholders from Italy as well as Belgium reported that obtaining subsidies is the main motivation in some cases to acquire the PO status. Tied to the benefits of this status are some important obligations, for example the obligation for farmers to sell all produce of a given crop through a single PO (except for a small percentage of direct sales).

The case studies have shown that cooperatives in the three different countries, although sharing the former two key characteristics, perform a very different range of functions. Table 1 provides an overview of these functions, grouped per type of cooperative and per country. In the remainder of this section, the prevalence and characteristics of each of these functions is briefly discussed.

Table 1. Functions of cooperatives in the three case studies, as identified in the collected data

	Belgium		Italy	Poland	
	Traditional Cooperatives	New Cooperatives	Cooperatives	Cooperatives	Producer Groups
Aggregating supply	✓	✓	✓	✓	✓
Logistical services to farmers	✓	✓	✓	✓	✓
Technical assistance	✓	✓	✓	✓	✓
Support for compliance with phytosanitary standards	✓	✓	✓	-	✓
Standardisation	✓	✓	✓	-	-
Quality assurance	✓	✓	✓	✓	✓
Branding and advertising	✓	✓	✓	-	-
Mediation for bilateral sales	✓	✓	-	-	✓
Wholesale (purchase of A&P produced by non-members)	✓	✓	-	-	-
Facilitating product innovation	✓	✓	✓	-	-
Lobbying at political level	✓	-	-	-	-

Firstly, the aggregation of supply is the basic function of each marketing cooperative. As discussed earlier, the aggregation process is a necessity for farmers who wish to sell towards multiple stage supply chains. Aggregation of supply allows cooperatives to obtain more bargaining power towards buyers of agricultural products as compared to individual farmers. A function that is naturally associated with the aggregation of supply is the provision of the logistical services necessary for this aggregation. The provision of logistical services is hence observed in all types of cooperatives, in all three countries. These include transportation services from the farm to the cooperatives' storage facilities, packaging machinery, facilities for the storage in a controlled environment, fruit cleaning machinery, etc.

A second common function of cooperatives is the provision of technical assistance to their members. This function was observed in all types of cooperatives, in all three case studies. Technical assistance typically entails supporting farmers in production decisions regarding fertilization, pest control, etc. A special form of technical assistance is the support to farmers to comply with phytosanitary standards, in order to gain access to overseas destination markets. Support in this case can be simply informing farmers about the requirements and certification procedures, but often entails certification at the cooperative level and consequently coordination of farmers' activities that are relevant to the phytosanitary requirements. All Belgian cooperatives, Italian cooperatives and Polish PGs appear to provide such support. Quite contrary, Polish cooperatives do not provide this service. The fact that they are almost completely oriented on the domestic market largely explains this feature.

Two strongly connected functions of cooperatives are the standardisation of producers' products and quality assurance. In both cases, the objective is to achieve access to markets for the members' produce. Typically, cooperatives develop and enforce standards that guarantee a high similarity and quality of products at the same time. The development of such standards has been observed in cooperatives in Italy and Belgium, but not in Polish cooperatives. A good example of such a multi-purpose standard is the Vegaplan standard, developed over ten years ago by the Belgian traditional cooperatives. Besides physical

product specifications, it incorporates requirements regarding pesticide residue levels and cross-compliance measures for CAP direct payments. The Vegaplan standard was designed in such a way that it is exchangeable with its German equivalent, thereby allowing access to the German market. Another example of simultaneous persecution of standardisation and quality assurance is the development of the quality brand Opera®¹ for Italian pears, raised by a consortium of cooperatives and other supply chain actors from the region of Emilia-Romagna. Opera® represents a market strategy to relaunch pear consumption in Italy. Such collaborations are known in Italy as “secondary cooperatives” or “cooperative consortia” (Bono, 2012).

Closely tied to standardisation and quality assurance as well is the function of “marketing”, understood as advertising or branding. The Opera® brand is a very clear example of this. It is the first case of a brand for pears in Italy. The strategy of the brand is to follow the example of the famous Italian apple brands: Melinda® and Marlene®. Traditional and new cooperatives in Belgium each have their own quality brand, which is branded as high quality fruit complying with strict quality requirements (e.g. Truval®² and Bel de Looz®³). The performance of “marketing” is thus commonly observed in the Belgian A&P sector, whereas it is a rather new phenomenon in the pear sector of Emilia-Romagna. Polish cooperatives and PGs seem not to have incorporated this function. Their strategy seems to be to compete on price, rather than quality or branding.

Belgian A&P cooperatives have shifted their activities to a large extent from selling aggregated supply to facilitating bilateral sales between member farmers and buyers. This shift was a general trend that started in the late nineties in F&V cooperatives in the Netherlands (Bijman and Hendrikse, 2003) and Belgium (Gijssels and Bussels, 2012). The reason to do so was mainly to cater to the needs of increasingly large buyers, often retail chains, who prefer to have a highly predictable supply of constant quality, and therefore prefer to buy from specific A&P growers repeatedly. Scale enlargement of farmers was a major driver of this evolution, according to Bijman and Hendrikse (2003). For the same reason, i.e. catering to the needs of very large buyers, Belgian cooperatives have incorporated the function of wholesale. This allowed them to supply their largest customers at times when their members could not, and hence made them more attractive trading partners. The shift of collective sales to mediated bilateral sales appears not to have taken place with the cooperatives in Italy and Poland. The sales of Polish PGs, however, are to be seen as bilateral sales rather than collective sales. In fact, Polish farmers often join a PG in order to outsource sales activities, without having to adapt production decisions to a cooperatives’ collective strategy.

Pursuing and investing in product innovation was observed with cooperatives in the Belgian and Italian case studies, but not in Poland. The main product innovations encountered in Emilia-Romagna are found with the previously discussed Opera® pears. Opera® pears are available in new, high convenience packaging formats such as disposable plastic boxes for individual pears. In addition, the consortium is focusing on innovation on varieties, that could be more attractive for consumers. Traditional Belgian cooperatives are mainly investing in the development of club cultivars, which are licensed cultivars that are produced only in limited amounts, and under very high quality requirements. In this way, a more constant high quality of club cultivars is achieved as compared to conventional A&P, as well as retail sales prices up to the double of the price of conventional cultivars. Two market conditions provide a logical explanation for the occurrence of product innovation efforts in the Italian and Belgian cases and the absence of it in the Polish case: firstly, both Belgian apples and Italian pears appear to have lost the preference of domestic consumers. Secondly, Polish apple farmers suffer less from international competition, as they face lower production costs.

¹ www.operalopera.it

² <http://www.bfv.be/consument/truval>

³ http://www.belexport.com/index_nl.html.

Last but not least, some cooperatives are major representatives of farmers in the policy process. This function is very clear in the case of the two Belgian traditional cooperatives that represent the majority of A&P farmers. The union of Belgian horticultural cooperatives, which represents among others the traditional A&P marketing cooperatives, lobbies intensively with national and European authorities to speed up bilateral trade negotiations, in order to gain access for Belgian A&P in extra-EU destination markets. Remarkably, the smaller new Belgian cooperatives appear to refrain completely from the policy process. They are not a member of the union of horticultural cooperatives. The stakeholders involved in the interviews and focus groups are not in contact with these organisations, whereas they are in contact with both the traditional cooperatives and the union of cooperatives. Consequently, the new cooperatives are often overlooked in the Flemish policy debate. The voice of Italian cooperatives in the policy process appears to be limited. This is likely the consequence of the relatively high fragmentation among cooperatives in Emilia-Romagna. In Malopolska, and likely elsewhere in Poland, cooperatives are hardly engaged in the policy process as well. In the case of PGs, the small size of these groups (typically five to 10 farmers) largely explains this. In the case of the traditional cooperatives, their connection to state authorities before 1989 explains the refraining of engagement in political activities today.

4. Discussion and conclusions

The different ranges of functions performed by cooperatives in the three case study regions reflect the different characteristics of apple farming in Malopolska (Poland), pear farming in Emilia-Romagna (Italy) and apple and pear farming in Flanders (Belgium). For example, the Belgian A&P sector is strongly specialised in the production of Conférence pears, a variety highly valued on the world market, for which the Belgian climate is particularly well suited. At the same time, the range of functions currently performed by the Belgian cooperatives is tailored to exporting fruits. On the contrary, apple farmers from Malopolska are generally oriented on the domestic market. Cooperatives and PGs from this region currently put little effort in standardisation, branding and advertising. The adjustment of the functions performed by cooperatives is associated with the specialisation of farmers towards certain markets. Identifying a cause and a result in this relationship is difficult, perhaps impossible, as both trends co-evolved over time.

However, the range of functions currently performed by cooperatives may enable or prevent farmers to adopt certain strategies. E.g. farmers have little incentives to increase the quality of their produce to a higher level if their cooperative does not brand it as higher quality fruit. Similarly, if a cooperative offers services to facilitate export to specific destination markets, members have strong incentives to export to these markets. Such an example was observed in Belgium: in order to comply with the very high phytosanitary standards of the Chinese market, employees of some Belgian cooperatives scan the surroundings of their members' farms on the occurrence of tree species that can accommodate fire blight bacteria (*Erwinia amylovora*). Consequently, member farmers of these cooperatives have the opportunity to export to (the otherwise hardly accessible) Chinese market. Member farmers that do not wish to export to China however face unnecessary costs because of this activity.

Strong incentives to align with a cooperative's main strategy may become a concern when farmers are not able to choose a cooperative which serves their interest well. This is currently a concern in Belgium, where the number of cooperatives has reduced to four. The risk of restricting farmers in their choice of strategies is one argument to maintain a certain diversity among marketing cooperatives.

Interviews with Belgian stakeholders have elucidated another risk associated with upscaling cooperatives to very high levels (> 1000 members): the threat to lose touch with the membership. More specifically, the feeling that their voice is not being heard any more is common among Belgian members of the traditional cooperatives. Often, marketing cooperatives are seen as third parties by farmers, whose interests conflict with theirs, instead of institutions over which they have ownership. As a reaction to this, some farmers moved to new, small cooperatives were formed, and some farmers left the cooperatives for individual

sales arrangements. Remarkably, the collapse of the Dutch vegetable marketing cooperative “The Greenery” in the late nineties occurred for the same reasons. The Greenery had the majority of the Dutch vegetable farmers among its members (Hendrikse and Bijman, 2003).

The interviews and focus groups revealed that both Italian and Polish stakeholders expect many gains from increasing cooperation and upscaling marketing cooperatives of A&P farmers. Experiences from Belgium and The Netherlands have taught however that the support of member-growers for the cooperative quickly decreases if it does not provide them with services that are well adapted to their individual needs, or if they feel that their voice is not being heard by the management of the cooperative. Cooperatives in Italy and Poland will thus have to find a balance between on the one hand scale enlargement, increasing efficiency and bargaining power, and on the other hand retaining a size at which they can cater to the needs of homogeneous groups of farmers, and listen to individual farmers’ concerns.

Acknowledgements

The authors gratefully acknowledge the funding of this research by the European Commission under the Horizon 2020 programme. The SUFISA project – *Sustainable Finance for Sustainable Agriculture and Fisheries* – is funded under grant number 635577. They also thank the anonymous reviewer of this paper for her or his thoughtful comments.

References

- Agricultural Markets Task Force (2016). *Improving market outcomes – enhancing the position of farmers in the supply chain*. Report of the Agricultural Markets Task Force, Brussels, November 2016, 73 p.
- Avermaete, T., Biely, K., Bonjean, I., Hannes, N., Larvoe, N., Lievens, E., Maes, D., Roba, J., Van Passel, S., Mathijs, E., (2017) *SUFISA Draft National Report Belgium*. Available online: [www.sufisa.eu/publications]. October 2017.
- Department of Agriculture and Fisheries (2014) *LARA 2014 - Landbouwrapport*. Available online: [http://lv.vlaanderen.be/nl/voorlichting-info/publicaties/studies/sectoren/landbouwrapport-2014]
- Bijman, J., and Hendrikse, G. (2003) Co-operatives in chains: institutional restructuring in the Dutch fruit and vegetable industry. *Chain and network science* 3(2): 95-107.
- Eurostat (2017) *Agricultural production – crops*. Available online: [http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_production_-_crops#Fruit]. Data extracted in November 2017. Website accessed on January 14th 2018.
- De Lacroix, E., (2003) *The horticulture sector in the European Union*. Factsheet. Brussels: European Commission, 16 p.
- DG AGRI (2017) Fruit and vegetable regime. Updated on February 22nd, 2017. Available online: [https://ec.europa.eu/agriculture/fruit-and-vegetables_en]. Website accessed on January 26th, 2018.
- European Commission (2016) *The pear market in the EU: production, prices and trade. Working document of the Forecast Working Group for Pears*. Available online: [https://ec.europa.eu/agriculture/sites/agriculture/files/fruit-and-vegetables/product-reports/apples-and-pears/expert-group/pears-2016-11_fr.pdf]. Published on 18 November 2016.
- Statbel (2016). Statistics presented at the web pages of Statistics Belgium, Federal Public Service Economy, SMEs, Self-Employed and Energy. [online]. Available on http://statbel.fgov.be. [Retrieved on 01/10/2016]
- Gijssels, C. and Bussels, M., (2012) *Support for Farmers' Cooperatives; Country Report Belgium*. Wageningen: Wageningen UR, 67p.
- Gondola Retail Facts & Trends (2016). *Aldi en Lidl samen goed voor 17,1% marktaandeel*. August 18th, 2016. Online magazine article. Available online: [http://www.gondola.be/nl/news/food-retail/aldi-lidl-samen-goed-voor-17-1-marktaandeel]. Website accessed on April 27th, 2018.
- Gorlach, K., Nowak, P., Jastrzębiec-Witowska, A., Dąbrowski, A., (2017) *SUFISA Draft National Report Poland*. Available online: [www.sufisa.eu/publications]. October 2017.
- Minarelli, F., Vergamini, D., Viaggi, D., Prosperi, P., Raggi, M., Bartolini, F., Brunori, G., Grando, S., (2017) *SUFISA Draft National Report Italy*. Available online: [www.sufisa.eu/publications]. October 2017.
- Nosecka, B. (red.). (2016). *Rynek owoców i warzyw stan i perspektywy*. Institute of Food Economy – National Research Institute, Warsaw, p.12.
- Pirazzoli, C. (2017) *Pear farming in Emilia-Romagna*. Presentation held at the 2nd Futurpera world fair on pear farming in Ferrara, Italy. November 16th-18th. Ferrara, Italy.
- Platteau J., Van Gijseghe D., Van Bogaert T. & Vuylsteke A. (eds.) (2016) *Voedsel om over na te denken. Landbouw- en Visserijrapport 2016*, Brussels: Department of Agriculture and Fisheries, 169 p.
- Statbel (2013). Landbouw - Oppervlakte van de Fruitaanplantingen volgens aanplantingsjaren, 2012 [online]. Available online: http://statbel.fgov.be/nl/modules/publications/statistiques/economie/downloads/agriculture_-_superficie_des_plantations_fruities.jsp Website accessed on October 20th, 2015.
- The News Poland (2014). *Poland overtakes China as world's top apple exporter*. April 10th, 2014. Newspaper article. Available online: [http://www.thenews.pl/1/12/Artykul/167864,Poland-overtakes-China-as-worlds-top-apple-exporter]. Website accessed on April 27th, 2018.
- VBT (2015). *Jaarverslag 2014*. Verbond van Belgische Tuinbouwveilingen. P. Appeltans – Tiensevest 136 – 3000 Leuven, 48p.

- Van der Straeten, B., (2016) *Rentabiliteitsanalyse appels en peren. Resultaten op basis van het Landbouw-monitoringsnetwerk: boekjaren 2009-2014*. Brussels: Department of Agriculture and Fisheries, Division of Monitoring and Study, 33 p.
- Wschodnik.pl (2015). *Polskie jabłka do Rosji przez Białoruś i Ukrainę*. August 4th 2015. Available online: [<https://wschodnik.pl/polska/item/1773-polskie-jablka-do-rosji-przez-bialorus-i-ukraine.html>]. Website accessed on January 24th, 2018.