Strengthening sustainable food systems through geographical indications: an analysis of economic impacts

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Food and Agriculture Organization of the United Nations

European Bank for Reconstruction and Development

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DIRECTIONS IN INVESTMENT

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PART II: CASE STUDIES

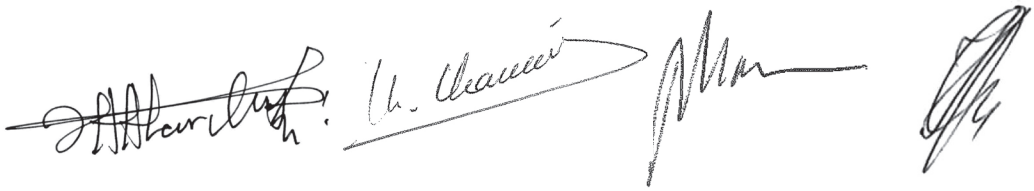
FOREWORD

Reaffirming the right of every person to have access to safe, sufficient and nutritious food, the Second International Conference on Nutrition – which took place in Rome from 19-21 November 2014 – adopted a Framework for Action aimed at governments. The conference's recommendations included strengthening local food production, especially that of smallholders and family farmers, promoting the diversification of crops in favour of underutilized traditional crops, and applying sustainable food production and natural resource management practices. Other recommendations included improving the availability of food and access to adequate supplies through appropriate trade agreements and policies.

In this context, the promotion of linkages between local producers, their local areas and their food products through geographical indications (GIs) is recognized as a pathway to nutritious food systems and sustainable development for rural communities throughout the world. The quality and specific attributes of food linked to origin, its diversity and local access are all matters that affect sustainable food systems and healthy diets. In various parts of the world, generations have built up their local identity through typical food products and a specific landscape that reflects the interactions between natural resources and production systems. Today, these linkages between products, places and inhabitants do not only represent a heritage to be preserved – partly thanks to GIs – but they also have a market value in their own right, as consumers become increasingly interested in quality linked to geographical origin and tradition.

GIs also represent a driver for sustainable value chains and territorial development. With the right technical assistance, they can boost the capacities of local stakeholders, strengthen upstream linkages in value chains, promote quality products and improve access to more remunerative markets. Borne from the cooperation between the Food and Agriculture Organization of the United Nations (FAO) and the European Bank for Reconstruction and Development (EBRD), a series of projects in Eastern and Central Europe have promoted that very approach: the utilization of GIs to build more inclusive and efficient agricultural and food systems.

To strengthen the evidence base of the positive impact GIs have on rural communities, FAO's Nutrition and Food Systems Division (ESN) and Investment Centre Division (TCI) have carried out the following review of the economic impacts of GI processes – based on case studies worldwide.



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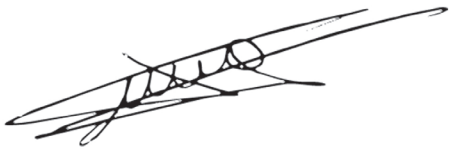
PREFACE

Origin-linked products can be part of a virtuous circle of sustainable quality based on the preservation of local resources and other factors described in the FAO-SINERGI guide *"Linking people, places and products".* The potential developmental impact of origin-based products is based on their specific features, resulting from a unique combination of natural resources (such as climatic conditions, soil characteristics and local plant varieties), traditional local skills and knowledge, as well as historical and cultural practices. Geographical indications (GIs) are used for products that can be linked to their production origin. They are a collective marketing tool that can be used for both the protection and promotion of specific products, as well as a way to enhance the provision of public goods – such as food heritage, landscapes, traditional knowledge and the rural economy at large. Owing to their territorial basis, GI products promote the role of producers in the value chain and can therefore play an important role in the sustainable development of local communities. This territorial focus can also be effective in driving collective efforts towards the achievement of the sustainable development goals (SDGs).

Although the positive impacts of the most famous GIs – such as Champagne or Parmigiano reggiano – have been well demonstrated, there has been relatively little research conducted on the economic sustainability of GIs in general. The main objective of this study is to provide additional evidence regarding the economic impacts of GIs on value chains and producers. Case studies related to nine operational GIs have been developed in collaboration with universities, which collected and analyzed data using quantitative and qualitative methods. These case studies, spanning a variety of contexts, are: Colombian coffee, Darjeeling tea (India), Futog cabbage (Serbia), Kona coffee (United States), Manchego cheese (Spain), Penja pepper (Cameroon), Taliouine saffron (Morocco), Tête de Moine cheese (Switzerland) and Vale dos Vinhedos wine (Brazil). The analysis of these cases provides evidence of the positive economic impacts GIs have on price, production volumes and market access. The analysis also produced preliminary findings of the economic resilience GIs can provide, and the positive externalities of GIs on other sectors. Finally, the study points to a number of considerations in terms of success factors and trade-offs and proposes a roadmap to maximize economic impacts and optimize the contribution of GI processes to more sustainable food systems and sustainable development in general.

We hope that this publication will be of interest to all practitioners interested in GIs and local development, from policy-makers to value chain players, donors and researchers.



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ACRONYMS AND ABBREVIATIONS

(Specific acronyms for each case study are listed in the relative chapter)

AO	appellation of origin
DO	designation of origin
EBRD	European Bank for Reconstruction and Development
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GIs	geographical indications
IPRs	intellectual property rights
OAPI	African Intellectual Property Organization
OECD	Organisation for Economic Co-operation and Development
PDO	protected designation of origin
PGI	protected geographical indication
SDGs	sustainable development goals
TRIPS	World Trade Organization's Agreement on Trade-Related Aspects of Agreement Intellectual Property Rights
UNESCO	United Nations Educational, Scientific and Cultural Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

What is this study about?

Geographical indications (GIs) refer to products with specific characteristics, qualities or reputations resulting from their geographical origin. This differentiates products based on unique local features, history or distinctive characteristics linked to natural and human factors, such as soil, climate, local know-how, and traditions. GIs are recognized as intellectual property rights (IPRs) and therefore offer both a helpful marketing tool and protection of the name.

Following the Food and Agriculture Organization of the United Nations (FAO) methodology of the virtuous circle of origin-linked quality,[1] GIs can be used to support sustainable development and sustainable food systems. If they fulfil their potential to promote economic development and food security, they can even provide a promising territorial approach to achievement of the Sustainable Development Goals (SDGs). In this view, ensuring economic viability is a key factor, but empirical evidence of the benefits of GIs is sparse, especially in countries where GI procedures are recent.

This study seeks to provide empirical evidence on the economic impacts that are generated through the GI process, beginning with the official recognition of a GI and the steps that follow. It focuses on the food sector and reviews nine cases, offering a variety of national contexts and local value chains. The approach considers "operational" GI processes: those in which a code of practice (or specifications) is defined and the GI is used and managed by a collective organization. The cases are: Colombian coffee, Darjeeling tea (India), Futog cabbage (Serbia), Kona coffee (United States), Manchego cheese (Spain), Penja pepper (Cameroon), Taliouine saffron (Morocco), Tête de Moine cheese (Switzerland) and Vale dos Vinhedos wine (Brazil). A specific methodological framework (detailed in the annex) has been developed based on qualitative and quantitative analysis of each case thanks to field work carried out by Masters and PhD students, so as to identify the economic impacts of GI processes and define the mechanisms involved.

Evidence on the economic impacts of GIs

Major impact of GIs on the price of final products

This study confirms a significant positive effect of GIs on price, regardless of the type of product, the region of origin, and whether the GI is long-established or recently registered. Indeed, the registration of GIs substantially increases the price of the final product in all the nine cases studied. The premium or added value varies considerably depending on the case – and also, for a single product, depending on the market. It ranges from 4 percent (Tête de Moine cheese on the domestic market, although it is 57 percent on the export market) to more than 120 percent (Penja pepper), to even more in the case of Taliouine saffron for producers who join a cooperative (500 percent). In most cases, the premium is between 20 and 50 percent.

1 See http://www.fao.org/in-action/quality-and-origin-program/tools/linking-people-places-products/en/ and http://www.fao.org/fileadmin/user_upload/foodquality/fichefiles/en/c1.pdf

This analysis shows that there are various mechanisms supporting the positive effect of the GI process on price:

- the ability of GIs to reduce asymmetrical information between producers and consumers by providing information about the link to origin, and consequently to increase consumers' willingness to pay higher prices;
- producers' ability, through their collective organization, to modify the organization of the market and intervene on the determination of price, either by controlling supply (creating a higher demand and increased price) or through an agreement among the value chain stakeholders to pay a minimum price to producers, as is clearly illustrated by Colombian coffee, Penja pepper and the two cheeses.

Better distribution to primary producers

The positive impact of GIs on value redistribution to upstream segments is observed in the two processed products (Manchego and Tête de Moine cheeses) and Colombian coffee. For the latter, the share of the price transmitted to producers by the National Coffee Federation increases by 25 percent with the registration of the protected geographical indication (PGI). The registration of the two cheeses has an effect on the milk price paid to breeders: milk purchased for Manchego cheese sees a 5.5 percent added value compared with non-GI milk, whereas in the context of a general fall in milk prices, the decrease is less for Tête de Moine milk than for milk for the substitute product. More systematic analyses are needed to confirm this positive result in other cases so that it can be generalized.

Positive influence on production, especially in the long term

In all the cases studied except for Darjeeling tea, the GI process affects production, although the effect is different in the short and long terms. "Mature" GIs, where long-term impacts can be observed, show that promoting a GI increases production over time. This is particularly clear for Kona coffee, which sees a 250 percent increase between 1995 and 2015, and 36 percent more producers between 1991 and 2012; Manchego cheese with an 83 percent increase in volume between 2001 and 2013; and Tête de Moine cheese with a 300 percent increase in volume between 1986 and 2014.

In the short term (immediately following registration), GIs can, however, provoke an initial decrease as a result of specifications that directly affect production (e.g. through more restrictive requirements or the delimitation of the production area). This is the case for Vale dos Vinhedos wine, with a reduction of 78 percent in production between 2012 and 2014, following the protected designation of origin (PDO) registration that has strongly modified some practices. Such a fall in production may be attributable to a smaller number of producers using the GI name as a consequence of its protection. This also occurs with Futog cabbage, where the amount produced under the GI falls by 76 percent between 2010 and 2014 once the use of the name becomes specified and regulated. In some cases, however, the GI can result in an immediate increase in production, as occurs with Penja pepper (+328 percent between 2010 and 2015) as a consequence of specifications that allow for greater productivity.

Enhanced market access

An increase in market access is observed in five cases (Darjeeling tea, Kona coffee, Manchego cheese, Taliouine saffron and Tête de Moine cheese), with a positive effect on both the number of destinations (extensive effect) and the value exported (intensive effect). For instance, the number of destinations of Darjeeling tea

rises from 35 countries in 2004 to 45 countries in 2015. The impacts of the GI on Manchego cheese are mainly explained by an increase in the export market share, from 50 percent in 2001 to 55 percent in 2013, with access to such new markets as the United States and Germany. In other cases, the GI allows consolidation of the position of the product on pre-existing markets (the "origin pepper" market in the case of Penja pepper).

Interesting preliminary findings regarding economic resilience

Preliminary findings regarding resilience[2] (observed in the six cases where data is available) reveal that GIs can be useful tools in building resilient value chains, especially by boosting the diversification of markets. Another way in which GIs can promote greater resilience is through "decommoditization", allowing products to avoid the effects of price volatility on commodity markets, as can be seen with Kona coffee, which targets niche markets, and Penja pepper, where primary producers are protected from price volatility thanks to a minimum price negotiated among value chain stakeholders within the GI association. The case of Tête de Moine cheese demonstrates the ability of the GI to withstand the effects of a shock, since the price of its milk was less affected than other milk by the fall in price following market liberalization in Switzerland in 2001.

Interesting preliminary findings regarding positive externalities for the territory

Through a domino effect, GIs can have a substantial positive impact on other sectors of the economy. Various types of externality from the GI process can thus be observed across the cases:

- Increase in the price of a substitute product, as is seen in the example of Futog cabbage, where the price of the substitute Bravo cabbage significantly increases with the GI registration (from RSD 8.62 to RSD 11.83 per kilogram on average); similarly, all the wines produced in the valley where Vale dos Vinhedos wines are produced benefit from the reputation of the name.
- Diffusion of innovative practices to non-GI producers, as is seen in the cases of Penja pepper and Vale dos Vinhedos wine, where the GI process allows for the development of the industry for non-GI producers. For instance, the number of producers in the Penja pepper area increases by 728 percent, as do the numbers in neighbouring districts (by 746 percent in Bouba, 800 percent in Loum Gare, etc.). It should be noted that in this latter case, the boom in pepper prices on the international and domestic markets also explain this increase.
- The ability of the GI process to act as a trailblazer for the development of other GIs, as is seen in the case of Colombia, where many other GI processes have been initiated since registration of the coffee GI in 2004. As a result, there are currently 23 GI products, 11 of which are non-agricultural items; a similar phenomenon is also observed after registration of the Vale dos Vinhedos wine GI in Brazil.

Key success factors

Specific quality for differentiation and adding value

The specific qualities that origin can provide emerge clearly as a pathway to positive economic impacts. This correlation between the quality defined in the specifications and economic impacts is based on various mechanisms:

2 In the economic literature, resilience concerns three main abilities: that of recovering quickly from an external shock, that of withstanding the effect of a shock, or that of avoiding the shock altogether.

- Relation between the specific and exclusive quality and consumers' willingness to pay: the positive effect of GIs on prices is at least partially due to the quality effect that allows consumers to identify a comparative advantage of purchasing the product. The quality must therefore be specific, exclusive, or greater; in other words, it cannot be substituted. This is illustrated in the case of Futog cabbage, where its organoleptic characteristics (taste, tenderness) are different from those of the substitute.
- Innovations boosting competitiveness: the specifications often introduce innovative practices that confer an advantage. Two categories of innovation can be observed: either (i) to meet market requirements or consumer demand as occurs for Tête de Moine cheese (with the introduction of a special cutting instrument to produce rosettes of cheese), or (ii) to modify some practice to increase productivity, as is the case for Penja pepper, which adopts more modern production techniques.
- Recognition of the role of primary producers in the specifications: upstream redistribution of added value as far as the primary producers is not automatic (for example, Futog cabbage has a monopoly at the processing level, with added value concentrated there). The specifications represent a crucial tool in ensuring a pay-back effect for farmers and producers by outlining their roles in providing the unique natural and human resources; they thus can bind the GI value chain to primary producers, who therefore have a say in negotiating price and more generally in managing the GI.
- Description of production practices in addition to the characteristics of the final product so as to ensure that the specific quality is maintained in the long term.

Last, the way the specific quality is defined in the code of practice or specifications depends on the type of product and the producers' strategy. A defensive strategy primarily defends a strong existing reputation against unfair competition, and the specifications will essentially reiterate existing practices. This differs from an offensive strategy, which seeks to establish the reputation of the GI product more solidly, and the specifications may be more innovative to adapt production to market demand.

Organized collective action

The collective nature of the GI process strengthens collective action in the whole area by bringing different stakeholders together, as is seen in all the cases.

A well-functioning GI organization can play an important role in the success of the GI process by ensuring value chain and stakeholder coordination and thus boosting the bargaining power of a group of actors (although this is not always the case), by allowing economies of scale in the supply of services or goods (in production, promotion or certification), and by increasing transparency on the market. Penja pepper, with its inter-professional association, is an interesting example of the capacity of private stakeholders from different stages in the value chain to agree on a minimum price for producers, which is of vital importance for small-scale producers. Kona coffee producers, on the other hand, have no agreement regarding the rules for using the GI – and this puts the reputation at risk in the long term.

Another important aspect to be considered is the time needed for stakeholders to build capacities and trust, leading to the necessary local combination of cooperation and competition ("coopetition"). The relatively older cases in Europe, such as Manchego and Tête de Moine, illustrate the increasing capacity of the governance structure to adapt to market requirements and adjust strategy according to production needs;

while more recent GI processes, such as that for Taliouine saffron, which may be highly supported by public or project funds, need to build trust among stakeholders.

Effective marketing strategies

Three main strategies have been identified as key success factors through our cases.

- First, GI branding: many cases show that the capacity to build agreements with downstream actors is an essential element in achieving economic impacts. As seen with Colombian coffee, branding strengthens the visibility of the GI product and promotes the correct use of its registered name at the point of sale.
- Second, the targeting of niche markets: our cases also show that the marketing strategy is driven by the kind of GI approach (offensive or defensive) and marketing channel (niche or mass). The best economic impacts are seen when the GI organization adopts a strategy of managing the volume of supply, as in the European examples, so that prices are not driven down by significant increases in volume, with production thus exceeding demand.
- Third, gaining access to new markets in times of change: developing or conquering new (niche) export markets can help avoid the effects of a national-level crisis. This occurred with Manchego cheese, which escaped the full impact of a domestic economic crisis by expanding exports to the United States.

Sound legal and institutional system

Thanks to the enforcement of related legal provisions, GI processes improve market efficiency by limiting unfair competition and free-riding and by reducing asymmetrical information to consumers through official logos and public campaigns. This is illustrated in countries where the legal and institutional frameworks for GIs have been established for a longer time and have allowed stakeholders to learn collectively, which in turn enables them to work smoothly. This is seen in the European examples as well as those of Colombian coffee, Darjeeling tea, and Futog cabbage. In places where the legal and institutional frameworks are more recent, the main difficulties arise when it comes to GI certification, since the legal framework for certification is often not defined in the legislation, as is seen with Penja pepper and Vale dos Vinhedos wine. Another important function of public players is the provision of support to GI development in order to enhance its contribution to positive public externalities.

Public authorities always play a role at some point and at some level of GI development, with the form of support depending on the context. Three situations are identified in which the strong involvement of public authorities is a key factor. First, support to GI development or promotion by local and/or national authorities with the provision of some incentives, as occurs for Penja pepper, Tête de Moine cheese, and Vale dos Vinhedos wine. Second, strong public-private coordination in direct management of the GI, as is the case of Colombian coffee because of the close relationship between Fedecafé and the national government. This is also seen with Manchego cheese, where public authorities are members of the GI organization. Third, direct involvement of public players in GI process decision-making is seen in the Darjeeling tea example through the National Tea Board, which manages the GI.

Trade-offs

The case studies also identify some important trade-offs that should be taken into account for appropriate decision-making regarding the GI strategy and process.

Exclusivity versus inclusiveness

Exclusion is at the centre of any differentiation strategy, with the need to distinguish what is "in" from what is "out", and the GI specifications are no exception. However, when dealing with producers inside the GI production area who are interested in the GI process, there may be a trade-off between inclusiveness and the economic success linked to an "exclusive quality strategy". Small-scale or traditional producers (who often build the image of the GI) may be excluded because they do not meet the requirements set out in the specifications, either as a result of practices that differ from those in the specifications (for example, when traditional practices are opposed to more industrialized ones) or because of a level of basic quality lower than the level expected of a "quality product" (for example, in terms of food safety or packaging). When defining the core elements of typicality, specifications should recognize the local practices on which the quality has been built through the generations, which often acknowledges the key role of traditional and/or small farmers.

However, market requirements and food safety may lead to necessary exclusion unless there is some transitional period during which technical assistance can help smallholders improve their practices and meet the requirements.

Bottom-up approach versus public support or technical assistance

A balance may need to be struck between implementing a GI process within the limited timeframe of a project and letting local stakeholders lead the process; and this is especially true when the stakeholders lack capacities. This issue is linked to the need to strike the right balance in public and private coordination. In countries where GIs are recent, producers are not familiar enough with the concepts and may not immediately have the capacity and resources to lead or make decisions on the process. In the case of Taliouine saffron, for example, public authorities and technical assistance compensate for small-scale producers' initial lack of knowledge and capacity. When public authorities provide strong levels of support, it is crucial from the very start to anticipate an exit strategy for the public and external players by building producers' skills and capacities and thus ensure their medium- and long-term empowerment in the GI process.

Economic versus environmental impacts towards more sustainable food systems

GIs can be drivers for rural transformation leading to more sustainable development, first because economic sustainability is an important step towards environmental and social sustainability, and second because the specifications can directly influence environmental sustainability depending on the requirements that are considered (local species or breed, specific agricultural practices, etc.). Nevertheless, specifications may also lack requirements regarding natural resource protection, and uncontrolled economic development may lead to overexploitation of the natural resources involved in production. It is important to carry out regular assessments of the economic, social and environmental impacts of the GI process (FAO, 2009). This is particularly true for cases similar to Penja pepper (where there is the risk of excessive pesticide use from intensification of production and the increasing number of producers), Kona coffee (where there is also a risk of excessive use of pesticides) and Darjeeling tea (where growing practices are particularly intensive).

Conclusion and recommendations

The study confirms the existence of positive economic impacts in the nine GI processes analysed. It will be recalled that the cases are selected as operational GI processes; in other words, the GIs meet the legal definition of a GI (a code of practice or specifications are defined and the GI is used and managed by a collective organization) and are being effectively used. The evidence collected thus confirms the hypothesis that when the basic conditions of GI registration are met, economic impacts do occur. The limitations of our study should also be borne in mind: the restricted sample size, the lack of quality data in some cases, and the recent nature of many of the examples. Nevertheless, the study provides important preliminary findings that should be developed further in future research.

GIs provide a promising ground for sustainability thanks to the link to origin and the capacity for reproduction of local resources (FAO, 2010) by reserving the territorial, natural and cultural assets underlying the reputation of the product. However, economic development, environmental preservation and social welfare may sometimes be perceived by producers as contradictory. The key is to think of sustainable development as a strategic orientation in preparing their own future by considering two important factors:

- reproduction of local resources: overexploitation of natural and human resources will damage the GI system itself and its viability in the long term;
- sustainability is increasingly important for market access and demanded by consumers, while negative environmental and social impacts could damage the image of a GI product or category of products.

The analysis of key stakeholders and the lessons learned from the cases allow recommendations for value chain stakeholders, public authorities and facilitators to be made with a view to enhancing positive economic impacts and fostering greater sustainability.

Recommendations for value chain stakeholders engaged in the GI process – farmers, processors and retailers:

- be careful when creating the content of the specifications or code of practice concerning specific quality in order to ensure equity and efficiency, through both strong differentiation (giving rise to added value) and upstream bargaining power (a fair redistribution of added value);
- consider medium-term rather than short-term processes so that trust can be built up among players and a coopetition approach can be developed;
- consider targeting niche markets and building supply control mechanisms to reduce price volatility and add more value;
- if relevant, from the start of the process, develop agreements between upstream and downstream segments of the value chain to ensure a fair distribution of value;
- pay careful attention to the specifications as a central tool (in terms of content and how they are agreed), so as to ensure not only equity and efficiency, but also the reproduction of local resources, by considering how requirements will influence the social and environmental dimensions of GI system sustainability;
- conduct regular assessment of impacts and adjustments.

Recommendations for public authorities:

- consider both protection and promotion policies in a sound policy framework;
- signal the quality dimension of GIs with official logos;
- ensure that the legal framework and its enforcement are appropriate for small-scale producers;
- ensure empowerment of producers, especially smallholders;
- facilitate changes in the specifications of registered GIs;
- consider new ways for certification to adapt to the diversity of local situations by building on the variety of possible verification systems: self-certification, second-party certification, and third-party certification, or even participative guarantee systems;
- support the use of GI development as a tool to establish sustainable food systems and value chains by integrating economic/social/environmental aspects into GI policies; for example, consider policies to remunerate positive externalities of the GI system on environmental and social dimensions.

Recommendations for facilitators (including those involved in research and development) and donors:

- raise awareness of the impacts of GIs and the key success factors in using them as drivers for sustainable local development, and facilitate technical assistance and investment in this field;
- enable the establishment of a governance structure ensuring horizontal and vertical organization as well as coopetition among stakeholders (see FAO Training Manual, 2017);
- facilitate the involvement in the GI process of every stakeholder in the supply chain and the widening of stakeholders from producers (growers, processors and retailers) to consumers and others concerned with the supply chain (local authorities, NGOs);
- promote information systems that provide transparency on specifications, prices and volumes;
- develop research to provide evidence of the link between the GI system and sustainable development, with the related key success factors;
- enhance the capacities of stakeholders in the GI supply chain to improve their collective project in order to improve the sustainability of their process.

PART I: Synthetic analysis

Chapter 1 – Introduction

1.1 Importance of geographical indications in the world

Geographical indications (GIs) refer to products with specific characteristics, qualities or reputation resulting essentially from their geographical origin. This offers differentiation to products that can be attributed to unique local features, history or distinctive characteristics linked to natural and human factors, such as soil, climate, local know-how and traditions.

GIs are recognized as intellectual property rights (IPRs) and have a legal existence at the global level through the 1958 Lisbon Agreement of the World Intellectual Property Organization (WIPO) and the 1994 Agreement on Trade-Related Aspects of Intellectual Property (the TRIPS Agreement) of the World Trade Organization (WTO). This allows the protection of products from imitations and their names from misappropriation. Like other intellectual property tools, this may be beneficial to market access and development. The TRIPS agreement defines GIs as "indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin" (Article 22:1).

GIs are not recent, but appeared with the first trade exchanges of famous origin-linked foods in Roman times and were then regulated in the medieval period in France (Marie-Vivien, 2015), thus representing the oldest type of trademark (Rangnekar, 2004). Since the late 1990s, they have become the subject of an important policy-making trend, especially in developing countries (Bowen, 2010a), as a consequence of the TRIPS Agreement, which requires WTO member states to provide legal protection to GIs.

There are currently more than 10 000 GIs in the world, mostly in the agricultural and food sector, with an estimated trade value of more than USD 50 billion (Giovannucci *et al.*, 2009). Many are well known worldwide, such as Darjeeling tea, Bordeaux wine, Parmigiano-Reggiano cheese, Idaho potatoes and Comté cheese, but many more are famous in their domestic markets, while some are anticipating a boost to their reputation from GI registration. Although about 90 percent of GIs come from Organisation for Economic Co-operation and Development (OECD) countries, interest in GIs is growing in developing countries.

1.2 Why a study on economic impacts?

FAO has carried out several case studies and field projects[3] that show that GIs can be used as drivers for sustainable and rural development, especially in the context of the 2030 Agenda for Sustainable Development and the related sustainable development goals (SDGs), which build on regional sustainability goals. This is a result of the use of locally tailored standards and a multifaceted development approach, combining a market dimension (in relation to IPRs) with linkages to public goods (heritage, food diversity, local know-how, local genetic resources etc.) (Vandecandelaere, 2011). Methodologies have been developed to support such an approach (FAO, 2009; 2011), in particular involving the idea that origin-linked products can be the pivot for a virtuous circle leading to sustainable development (FAO, 2009). In this view, the economic viability of companies in the value chain is one of the three pillars to be ensured. Without economic viability, no strategy can be maintained and further developed to allow ongoing positive contributions in the social, environmental and cultural spheres. Producers may maintain sustainable practices when their products can access differentiated and sufficiently remunerative markets, instead of following a strategy based on intensification

3 More information can be found on the programme website: www.fao.org/in-action/quality-and-origin-programme/en

(high volumes and low prices), which often has negative effects on natural resources.

Evidence on economic impacts is a key to supporting the rationale of GIs as drivers for sustainable development projects and as tools for sustainable development. Economic returns are a key argument for value chain stakeholders to engage in GI processes. Donors interested in GI strategies also like to receive evidence on GI economic impacts from a variety of situations to help them make decisions on GIs as project drivers or for a collective marketing strategy.

Although empirical evidence of the benefits of GIs does exist, it is sparse, especially in countries where GI procedures are recent, namely outside Europe and in developing countries. In addition, significant conclusions on causal relations are hard to draw because of the wide diversity of systems studied (Aragrande, 2013). Moreover, it is not always clear whether the benefits are greater than the implementation costs: a GI process may entail higher production, organization and marketing costs or may hinder economies of scale. It is important to address the questions of the mechanisms or impact paths through which benefits greater than the costs are created, also taking into account the time needed for the benefits to appear (the short- and longer-term effects).

1.3 Objectives and scope

The objective of this study is to support the rationale of GIs as drivers for sustainable development projects and tools for contributing to sustainable food systems, by providing empirical evidence on the economic impacts generated through the GI process, i.e. the process paving the way for official recognition of a GI.[4]

The study focuses on the food sector, and reviews nine cases offering a variety of national contexts (developed and developing countries, recent and longer established legal and institutional frameworks, protection under trademark and *sui generis*[5] systems etc.) and local value chains (types of product, local and export markets, the main objective of the GI process). GI impacts are analysed at company and value chain levels. Depending on the cases and available data, some additional insights from territorial impacts are possible, while in-depth economic quantitative evaluation was not possible in some cases, although the preliminary findings provide the basis for further analysis.

This first part is entitled "Synthetic analysis". After the present introductory (section I), it provides a background to GIs and their economic impacts, as drawn from a review of the literature (section II), followed by a short description of the analytical framework (section III). The results of the study are then presented, starting with a synthesis of economic impacts (overview of the GI process, impacts on price, production and market access, with preliminary findings regarding resilience [6] and territorial effects) (section IV). Following this, the main causal mechanisms (specific quality, governance, marketing efforts, legal and institutional framework) are synthesized (section V). The main lessons learned are then described (section VI), followed by a conclusion and recommendations (section VII).

4 The GI process refers to the series of actions designed and implemented by local stakeholders with the aim of preserving and promoting an origin-linked product through identification of its link to origin and formalization of the related rules on production and processing methods (the official code of practice or specifications once they are registered).

5 Latin for "of its own kind", used to describe a form of legal protection that exists outside typical legal protections; in this case related to intellectual property law rather than trademark law.

6 Resilience is the ability to become strong or successful again after something bad happens, to absorb shocks and return to the original situation.

Chapter 2 – Background: what does the literature have to say about geographical indications and their impacts?

2.1 Geographical indications: what is at stake?

Throughout the world, consumers, producers and public authorities are showing a growing interest in food and agricultural products with a link to origin (Barham and Allaire, 2011). This link is the result of a combination of local resources, i.e. natural resources (species or breeds, soil and climate conditions, landscape, micro-environment etc.) and human and cultural resources. It provides not only reassurance regarding the origin of food and production methods, but also more diversity and authenticity in diets.

Origin-linked products may be referred to in a variety of ways (*terroir* products, traditional products, regional foods, genuine products etc.), but they all build their value from their link to origin (Barham and Allaire, 2011). When the origin-linked product bears a specific name related to the place of production, the GI, this is the starting point for a strategy of territorial development based on a virtuous circle of origin-linked quality (FAO, 2009; see Box 1).

The GI definition and its particular nature give rise to some important characteristics. The basis of a GI (or AO[7]) as an IPR is the recognized link between the specific characteristics or reputation of a product and its origin. These are inherited from the efforts of the local community over the course of generations, which means that a GI represents a collective property right (Gangjee, 2000; Barham, 2003). The collective nature of GIs is therefore most often tied to an organization (structured and formalized to varying degrees) (Fournier, 2008), which can be analysed in terms of governance.

The link to origin is the source of product differentiation, while recognition of ownership and efforts to maintain the link over time and build up the related reputation are the factors underpinning the right to legal protection of the GI. If the producers decide to engage in the process of legal protection, this link between origin and the characteristics of the product can be defined and shared among them. The specifications (or code of practice or standard) represent a key instrument in formalizing the rules for producing the GI item (Belletti *et al.*, 2014).

Box 1: The origin-liked virtuous circle

The origin-linked product can become the pivot of a quality virtuous circle within a territorial approach, meaning that its promotion through a GI process can have positive effects that increase over time, permitting the preservation of agrifood and related social systems and enabling local stakeholders to pursue economic, sociocultural and environmental sustainability. The origin-linked quality virtuous circle can be used as a way of supporting local stakeholders in dealing with the various factors involved in the development of a GI product system and enhancing the potential for sustainable development. The main stages of the origin-based quality virtuous circle are:

- identification: local awareness and assessment of the potential of the product;
- product qualification: setting up the rules for value creation and preservation of local resources;
- product remuneration: this aspect is linked to marketing aspects;
- reproduction of local resources: this aspect entails improving the sustainability of the system;
- public policies: these provide the institutional framework and possible support for all the stages.

Source: FAO-SINERGI guide "Linking people, places and products".

7 An appellation of origin (AO) is a similar IPR, first defined in the Paris Convention for the Protection of Industrial Property (1883) and then in the Lisbon Agreement for the Protection of Appellations of Origin (1958), with a further precision as to the quality linked to origin, because of local traditional methods or natural resources involved in production. An AO is thus a GI, and in the present study, GI is used as the general term covering both GIs and AOs.

GIs are also marketing tools, both for differentiation and for producer/consumer protection. They act as signals of quality in the market (Galtier *et al.*, 2013; Teuber, 2010). It is thus interesting to see how the GI process is a driver for coordination among value chain stakeholders.

The link to collective resources and public goods (such as reputation, food heritage, culture, biodiversity and rural development.) would argue in favour of public intervention, not only to protect IPRs, but also to enhance the contribution to the preservation and promotion of public goods (Vandecandelaere, 2016).

Lastly, two main approaches can be observed in practice:

- The offensive approach is a collective strategy of differentiation and promotion that a producers' group or a support organization sees as a good way of improving the marketing of the product through access to new markets and building the reputation of the product in order to encourage consumers to pay more. A local agreement on the nature of this differentiation (and the associated know-how) is reached, so that a GI can then be registered, recognizing this differentiation (Durand and Fournier, 2015).
- The defensive approach, most frequently discussed in the literature, is seen in cases where a GI already benefits from a well-established reputation and the typicality of the GI product is recognized by consumers, so that registration of the GI aims primarily at protecting the product against imitations and misappropriation of the name. In such cases, historical stakeholders in the supply chain develop specifications or a code of practice to create barriers to the entry of non-GI producers (Barjolle and Jeanneaux, 2012).

2.2 What is known about the economic impacts of GIs?

2.2.1. Impacts on companies: production, price and income

Case studies in the literature refer to effects on production volumes, but no general conclusion can be drawn: an increase or decrease in the overall volume under the GI process can lead to higher productivity, restricted yields or a reduction in the number of producers (Gerz, 2013).

Regarding price premiums, many studies demonstrate that GI registered products achieve a price premium over the corresponding standard products (Areté, 2013; Babcock and Clemens, 2004; Barjolle, Reviron and Sylvander, 2007; Barjolle and Sylvander, 2000; Belletti and Marescotti, 2006, 2011; Frayssignes, 2005; Larson, 2007; Bowen, 2008; Colinet *et al.,* 2006; Babcock and Clemens, 2004; European Commission, 2003; Jeanneaux and Perrier-Cornet, 2011). Nevertheless, the wide variations in situation do not allow any clear-cut conclusions to be drawn on the level of premiums. The prices of GI registered products are on average 10 to 15 percent higher than those of similar but non-GI products in the European Union, although the figure is often 35 to 45 percent (Campania buffalo mozzarella, Normandy camembert, Alicante turron, and Meaux or Melun brie (O'Connor *et al.*, 2005)). A more recent study also confirms this premium, although the price difference was less clear for farmers who supply agricultural raw materials (Arreté, 2013).

The GI literature could not conclude that there is a fair distribution of added value within value chains, especially to farmers. A number of studies show a premium for local farmers (Desbois and Nefussi, 2008; Gerz and Dupont, 2006; Chambolle and Saulpic, 2006), while others conclude that added value tends to be captured by traders and distributors rather than producers (Fitter and Kaplinsky, 2001; Belletti, Marescotti and Touzard, 2015). In the European Union, suppliers of agricultural raw materials generally receive up to 25 percent of the retail value of products, and in some cases up to 40 percent (Areté, 2013).

The impact on community and household income and welfare is rarely studied, but some positive results have been observed (Jena and Grote, 2010; Dogan and Gokovali, 2012; Jeanneaux *et al.*, 2014). There has been no benefit to the local community in the case of tequila, although there has been a large increase in production and sales (Bowen and Valenzuela, 2009).

Further research is therefore needed into the conditions that could ensure a high return in terms of economic benefit to local communities where the GI process is implemented.

2.2.2. Impacts on value chains and markets

Regarding governance and market power along the supply chain, the switch from local to more distant markets introduces new power relations into the supply chain (Bowen, 2010b), considerably increasing the bargaining power of the upstream segment linked to exploitation of local resources. The collective nature of GIs is most often connected to a collective organization (Barjolle and Sylvander, 2004; Belletti *et al.,* 2015), leading to the creation or strengthening of the producers' organization and improved value chain coordination. Although many studies mention it, this particular impact has not been analysed as such. Some studies have also reported a lack of any positive impact in terms of market benefits (Arzuza and Giuliani, 2014).

The GI process also improves market access, thanks to the quality signal and the differentiation strategy. Interestingly, market access is shown to be potentially affected not only for the GI product but also for non-GI products of the same company, inasmuch as the quality position of the registered GI product can benefit the company's production and reputation as a whole, allowing it to market the rest of its production better (Belletti and Marescotti, 2011).

The reduction in unfair competition and the legal certainty created by GIs may increase investment in the area covered by the GI (Zografos, 2008), but little attention has so far been given to evaluating the effects of the legal protection of GIs (Belletti and Marescotti, 2011).

Similarly, GI legal recognition should increase quality and reputation (Belletti, 2015), leading to a higher price or improved market access, but no specific empirical evidence can be cited.

Resilience is a particularly interesting aspect, combining a variety of factors (price, market, production), but little has so far been published on this point.

2.2.3. Impacts linked to sustainable development

Economic impacts at company and value chain levels lead to more global impacts on the region outside the area or on other activities, linking GI processes to agricultural dynamics in production areas (Hauwuy *et al.,* 2006).

The effects of GI processes on the creation or maintenance of rural employment are considerable (Barjolle and Thévenod-Mottet 2002; Dupont, 2003; Aubard, 2010; Barjolle, 2010), enabling local people to stay in the production area (Réquillart, 2007; European Commission, 2014).

In addition, a number of studies emphasize GI impacts on tourism through the preservation of a regional cultural heritage (Suh and MacPherson, 2007; Belletti and Marescotti, 2011; Smardzic *et al.*, 2013).

The production and marketing of GI products can affect natural resources either positively (preservation and enhancement) or negatively (overconsumption), generating externalities and preserving (or not preserving) public goods (Bowen *et al.*, 2008; Belletti *et al.*, 2015; Schmitt *et al.*, 2016).

The reputation of a GI can generate externalities, with non-GI producers or non-GI products also benefiting from the name – as in the case of tequila, where added value is captured by out-of-area actors (Barjolle, Paus and Perret, 2009) or that of Tuscan wine producers who benefit from the reputation of Chianti (Perrin, 2012).

2.2.4. Success factors for economic impacts

Various studies concur in identifying the following key success factors in obtaining a price premium:

- **intrinsic product differentiation** and quality (Areté, 2013; Barjolle, 2015), because a collective reputation depends crucially on achieving and maintaining a consistent level of quality (Bramley 2011); in other words, an effective link to the *terroir* (Casabianca *et al.*, 2011) and its translation into a consistent code of practice are needed;
- **effective marketing efforts** (Aubard, 2010; Barjolle, 2010), strategies and tools, including a focus on both short chains and export-

oriented strategies, and support to promotion and consumer awareness-raising (Areté, 2013); it is also important to ensure the involvement of all the economic stakeholders in the sector (particularly the producers of the agricultural raw material used in the GI) in defining the marketing and commercial strategy for the GI;

- **an efficient collective organization and cohesion among operators** are crucial in achieving a fair distribution of value (Barjolle *et al.*, 2007; Jeanneaux and Mélo, 2016), which is determined by the level of supply chain governance (Reviron, Thévenod-Mottet and El Benni, 2009); this is a result of technical and organizational skills and the networks that enhance competitiveness (Barjolle *et al.*, 2009); collective action also makes it possible to manage supply volumes through quality levels (i.e. grading) or quantity levels (i.e. quotas) to increase the market price and reduce volatility (Jeanneaux and Perrier-Cornet, 2011);
- **a legal and institutional framework**: in the absence of control systems, or in the case of the poor functioning of those that do exist, stakeholders inside or outside the GI system can capture the acquired reputation of the registered GI (Belletti and Marescotti, 2011);
- some elements have been mentioned as key success factors by the Economic Commission of the French Quality and Origin National Institute (INAO, 2016): **investment capacity** or the capacity of the collective organization and the public sector (the institutional framework) to dedicate sufficient resources to the GI process, especially its establishment (the studies had to demonstrate the link to origin) and its promotion (training, communication etc.); **territorial dynamism** is also an important asset for the GI process, especially when the GI is intended to benefit not only those involved in the value chain but all those in the area; this dynamism depends on the importance of the product for its area (in terms of image, economy and identity), complementarity (as opposed to competition) between production of the GI item and other activities, the role played by local public authorities to facilitate synergy, and the balance of power between producers and these civic players (Durand and Fournier, 2015; Bowen, 2010b); and, lastly, a **sufficiently large scale of production** has also been mentioned regarding the differentiation strategy, to justify the cost of creating and maintaining a differentiated image among consumers (Hayes *et al.*, 2003).

The methodological approach described in the following section was developed on the basis of these considerations drawn from the review of the literature.

Chapter 3 – Framework of analysis

The methodology adopted is to measure the capacity of a GI process to generate economic impacts for both company and value chain in terms of price and income (and hence redistribution of value back to the first link in the chain), production volumes and market access, and also, when possible, its impacts on sustainable development in terms of resilience.

The analysis is based on a series of nine case studies (see Table 1), which provide empirical evidence and were selected to cover a range of situations and ensure a diversity of:

- countries, with cases from developed, transitional, and developing countries;
- products;
- markets (export, local);
- size (number of producers, volume);
- legal protection tool (*sui generis* GI, trademark);
- approaches either focusing on promotion (the offensive approach) or protection (the defensive approach); some cases can combine the two, when there is an existing reputation that needs to be better established and disseminated.

In addition, we have selected situations where the GI was operational, so that, in line with the GI concept,

- specifications (or a code of practice) have been defined;
- a collective producers' organization is in charge of GI management;
- the GI is used in the market (with a label or other signal to the buyer/consumer).

The research was carried out in six stages:

Stage 1: Design of the general methodological framework, selection of cases and identification of students, taking the language and culture of each country into account (February-April 2015).

Stage 2: Adaptation of the general methodological framework to each case, followed by data collection in the field (face-to-face interviews, internal data on the producers' group, documents, official data and statistics where available) and then a first evaluation of impacts, carried out by a student as part of his or her master's degree work under the supervision of the steering committee, and using in particular the typical farm approach to analyse the difference in price and production costs between the GI and non-GI systems (April-August 2015). The first analysis is built on various components:

- a description of the product and the value chain, together with analysis of the creation of the value added by the GI;
- analysis of distribution of economic value;
- analysis of the effect of the GI on market access and market diversification (local, global, professional, high-end products etc.);
- evaluation of economic impacts according to hypotheses formulated in each case;
- identification and analysis of causal relations.

Stage 3: Sharing of preliminary findings of the first analysis at a seminar attended by the steering committee and the students, where the modalities of the comparative analysis were discussed and defined (September 2015).

Stage 4: A second evaluation through in-depth quantitative analysis, seeking to correlate economic impacts based on a comparative time series (the diachronic method, comparing before and after the GI process) or comparison of the GI product and its non-GI substitute (the synchronic method), through econometric methods (see Annex 1), to provide conclusions regarding the economic impacts of the GI process (November 2015–April 2016).

Table 1: Presentation of the case studies

GI product	Product description	Size	Location	Markets	Producers' organization	Registration	Objective of the GI approach	Certification	Specifications
Colombian coffee	Arabica coffee, green or toasted beans etc.	More than 560 000 coffee growers; approximately 13 million 60-kg bags produced	The whole country, but the main production is on the Andean Cordillera, Colombia	Inter-national	Fedecafé (coffee growers, cooperatives, Cafécert, Almacafé, Cenicafé)	1980: trademark *sui generis* approach 2004: national GI 2007: PGI in Europe	Promotion	Almacafé and Cafécert under Fedecafé coordination	Yes
Darjeeling tea	Green, black, white or Oolong tea coming from 87 gardens	87 gardens, producing approximately 10 000 tonnes	17 820 hectares in the Darjeeling area in northeastern India	Domestic and inter-national	Tea Board of India and Darjeeling Tea Association (87 Darjeeling gardens)	1986: trademark in India; trademarks in various other countries. *Sui generis* approach: 2004: national GI 2011: PGI in Europe	Protection	Third-party (IMO)	Yes
Futog cabbage	Fresh and sour green cabbage	35 producers, producing 460 tonnes	5 000 ha delimited area, PDO Futog cabbage only on 22 ha in the Danube plain in northern Serbia	Domestic with few exports	Futog cabbage association (producers, processor and supporters)	*Sui generis* approach: 2009: national PDO 2012: first certification	Protection	Third-party (Organic System Control)	Yes
Kona coffee	Arabica coffee, green beans	From 700 to 900 growers, producting approximately 1 500 tonnes	West coast of Hawaii's Big Island – Kona district	Inter-national	Kona Coffee Farmers Organization; Kona Coffee Council	2000: trademark	Protection	Until 2012 Hawaii Department of Agriculture No certification	Hawaii Coffee Law
Manchego cheese	Cheese aged from 60 days to 2 years from Manchego sheep milk	785 milk producers, producing 11 000 tonnes of cheese	La Mancha region, Spain	Inter-national	Manchego Cheese Designation of Origin Regulatory Council (milk producers, cooperatives, cheese factories)	*Sui generis* approach: 1982: national GI 1996: European PDO	Protection	Certification committee within the regulatory council	Yes 2 changes (1995 and 2008)

GI product	Product description	Size	Location	Markets	Producers' organization	Registration	Objective of the GI approach	Certification	Specifications
Penja pepper	Generic variety well adapted in the *terroir*. Mainly white, but also black, green or red pepper	200 producers under the PDI scheme, but about 5 000 local farmers have pepper vines in their farms. Between 200 and 300 tonnes produced	Mungo district in southwestern Cameroon	Domestic and some inter-national niche markets	GI Managing Group (nursery, producers and distributors' organizations)	*Sui generis* approach: 2013: PGI	Protection	Not yet certified	Yes
Taliouine saffron	Unground or ground saffron filaments	About 2 300 producers, producing approximately 3 000 tonnes	Tailiouine and Taznakht towns in the Souss Massa Drâa region, Morocco	Domestic & inter-national	FIMASAFRAN (defence and management body): PDO and non-PDO are all represented	*Sui generis* approach 2010: national PDO	Protection and promotion	Third-party (Normacert)	Yes
Tête de Moine cheese	Semi-hard cheese with a special instrument for its consumption	269 milk producers, producing 2 200 tonnes of cheese	Northwest region of Switzerland	Inter-national	Tête de Moine Inter-professional Association (milk producers, cheese-makers, ripeners)	*Sui generis* approach: 2001: national DO 2011: PDO in Europe and Russia	Promotion	Third-party (Intercantonal Certification Body)	Yes
Vale dos Vinhedos wine	Red, white and sparkling wine	1 900 hectolitres of wine produced since 2012. About 26 wineries, 9 of which produce under the PDO scheme	Vale dos Vinhedos district, in the Serra Gaucha region of southern Brazil	Domestic	APROVALE (wineries and other enterprises working with tourist activities)	*Sui generis* approach: 2002: national PGI 2012: national PDO	Firstly promotion and secondly protection.	Regulatory Council under APROVALE	Yes

Source: authors' elaboration based on data gathered for the study.

Stage 5: A summary of each case (description of the process and the results) and definition of the roadmap leading to the economic impacts (the main causalities of the various impacts for each case, May–October 2016). The cases are presented in the following sections, where economic impacts are described through: supply chain analysis, quantitative impact analysis (cf. table of impacts) and causalities chain analysis (cf. diagram).

The summary of each case provides information on the history of the product, its features and its value chain.

Stage 6: Synthesis of all the impacts and their causalities (August 2016–January 2017). Building on cross analysis of the nine cases, complemented with the literature review, conclusions on economic impacts and their causalities are drawn and summarized in this section.

Chapter 4 – GI processes and their economic impacts

In this section the various types of economic impact observed in each case are synthesized (impact on price and income; on production; on market access and competitiveness; on resilience; and at the territorial level). As a preliminary, a description of the GI process and the general effects in each case is provided (see Figure 1 and Table 2).

Figure 1: The nine cases

Source: Authors.

Table 2: The nine cases in a nutshell

Colombian coffee	This GI, applied to a flagship commodity of the international market, is based on a well-established strategy of differentiation linked to origin, thus ensuring prices that are certainly dependent on the world market but that are superior to it and benefit small producers. It also contributes to strengthening of a country's global reputation. The governance of this GI is very effective: Fedecafé strengthens its political legitimacy notably through its efforts to promote Colombian coffee, protect its reputation and ensure redistribution of added value to smallholders, in particular by setting a minimum price paid to producers. Lessons learned: • setting a minimum price with purchasers integrated into the process is key for producers; • the GI strategy combined with brands has positive effects even in the case of an export product for which part of the differentiation takes place mainly outside the area of origin (roasters) and not always differentiated at the level of the final product (blending).
Darjeeling tea	This GI was set up to protect the name of an old, well-known product for export and to develop new markets. This strategy, led by the state, is more a response to the demand of sophisticated consumers in the international market than a result of an endogenous, local dynamic. The impact of the approach in economic and employment terms is notable, allowing support to social and environmental improvements. Lessons learned: • a government-led coupled with export-oriented GI approach that takes little account of the endogenous aspect of local dynamics can be developed; • the GI can enable the enforcement of labour regulations and therefore increase employment by reducing illegal labour when the specifications impose respect for international labour standards.
Futog cabbage	This recent GI targets local production with the twofold objective of preserving a local variety and enhancing economic development. As the reputation of Futog cabbage was well established due to its specific use in cooking the famous traditional dish *sarma*, the effect of certification on prices was immediate and positive for producers. The young institutional framework implies a collective learning of the new system, mainly in order to finetune procedures and sensitize all players, in particular producers and consumers. Lessons learned: • environmental (i.e. preservation of local varieties) and economic objectives (price increases) are not antinomic, but may be synergistic; • the GI strategy also demonstrates its relevance in the case of small-scale local production for the local market; • when the product has a well-established reputation, the effect of certification in terms of added value is immediate.
Kona coffee	The approach in this case is based on the high reputation of the product. Despite the absence of specifications, it ensures significant positive economic impacts for producers. Two views of the GI coexist in this case, which is a source of tensions among the stakeholders in the sector: • the GI as a tool of differentiation in the international market for a high-quality coffee, a niche product based on a solid reputation, allowing blends even if this entails a risk of misappropriation of the name and consumer fraud; • the GI as a territorial development tool, with the maintaining of small farms and the development of farm shops, integrating all the tasks from production to marketing and offering 100 percent Kona to informed, demanding consumers. Lessons learned: • protection of the geographical name linked with a certain quality can be a cause of conflict if the interests and goals are not shared by all the stakeholders; • direct sale (boutique farm model) and local tourism are powerful territorial development tools for a niche market, complementing the strong reputation of the product and its geographical name; • confusion for the consumer in the face of contradictory or even misleading labelling.
Manchego cheese	Implementation of the Manchego cheese PDO has allowed protection of a specific sheep breed and recognition of local know-how in order to face strong competition and counter the risks of usurpation. This long-established GI is well organized, supported, efficient and largely open to export. The Manchego cheese PDO sector has recently evolved to deal with a crisis situation with success for the stakeholders who have been able to stay in the sector, thanks to development of the United States market. This strategy changes the vision of the GI tool, so far the guarantor of a traditional know-how and a territorial development strongly linked to the *terroir*. Lessons learned: • the GI can be a tool for protecting biodiversity through specifications targeting an ancient breed or variety, specific to a region; • advantage of analysing a long-term strategy: an old GI can evolve into new markets and reinforce its reputation.

Penja pepper	Implementation of the GI has had a prime mover/driver effect on the entire pepper value chain (GI and non-GI) in the region and beyond, allowing significant technical improvements in terms of productivity and quality, as well as having an important impact on local development. The GI process seeks to include farmers in the quality and differentiation strategy and to share the added value coming from some niche markets. The role of the interprofessional body, which brings together producers, nurseries and distributors, is decisive in collective action, especially by ensuring an annual minimum price for pepper from Penja. It must now be consolidated, in particular to ensure certification. Lessons learned: • implementation of the GI through its specifications leads to technical innovations positive for the stakeholders in the value chain and beyond; • the interprofessional body of the GI, bringing together the various value chain stakeholders, can strengthen its role of collective support, for example by fixing a minimum price.
Taliouine saffron	The GI approach in this case aims to encourage development of a flagship product within a territorial dynamics, to allow local development and stop rural migration in an economically marginalized zone. It is based on a set of specifications incorporating traditional practices and includes all producers. Introduction of the GI has a positive economic impact for them. The approach has a leverage effect on the structuring and professionalization of the value chain and is part of a strong public policy to support small-scale agriculture, especially by the creation of a 35-cooperative network. It requires the assumption of ownership by the stakeholders to ensure its sustainability. Lessons learned: • a GI approach with strong technical and financial support from public players can help to upgrade quality management, structuring of a sector and formalization of markets; • the issues of producers' assumption of ownership and the sustainability of the GI approach are posed in a context where the GI process is initiated in a top-down manner by the state; • training and capacity-building of stakeholders, particularly women, are crucial for empowerment and ownership of the whole GI process in the middle to long terms.
Tête de Moine cheese	Development of a technical innovation to present the cheese to consumers in a new form made it possible to revive the Tête de Moine cheese value chain in the 1980s. This product occupies a seasonal niche market, with a high added value, thanks in particular to the diversification of cheese factories. The sector is highly supported by public players. The interprofessional association of the Tête de Moine cheese PDO is well organized and effective in promoting the product, which is based on an old and well-established reputation. Lessons learned: • advantage of a technical innovation associated with the specifications to boost the sector by offering consumers a special form of presentation of the cheese (rosettes); • the role of the interprofessional body is essential in the management of quality but also of volumes; • the state may support the economic impact of the GI by supporting promotion of the product; • a seasonal niche market is made possible thanks to the diversification of cheese-making activities.
Vale dos Vinhedos wine	This GI approach initiated in response to competition from foreign wines was based on the identity of the valley and contributed to its tourism development. It has also had a driver effect on other wine-growers, who have adopted its innovative practices in the valley and beyond, also increasing the risk of misappropriation of the Vale dos Vinhedos name. Evolution from the PGI to the PDO, which is more demanding in terms of cultivation practices, has led to the exclusion of certain farms but also contributed to the creation of new ones. This PDO product is positioned as the flagship of the valley and has a driver effect on other stakeholders. It would be helpful to observe this evolution over the next few years, with the current lack of feedback making it impossible to draw conclusions at present. The pressure on land will undoubtedly affect this development, the price of land being very high today. The PGI and PDO approach has led to an increase in the incomes of the wine-producing establishments involved. The role of APPROVALE, which is strongly supported by public players, is fundamental in its development. Lessons learned: • dissemination of new techniques defined in the GI specifications can contribute to an improvement in the quality of the wine of a region, beyond the members of the GI, and to the conquest of new markets; • a demanding GI approach can lead to the development of a flagship product that has a driver effect on all socio-economic stakeholders in its production region.

Source: authors' elaboration based on data gathered for the study.

Table 3: Main findings regarding impacts on price

Case study	Price
Colombian coffee 2004: national DO registration 2007: EU registration of the PGI	The proportion of the price transmitted to growers has increased since registration of the PGI: before, growers received 68% of each dollar paid by roasters to Fedecafé on the international market, and afterwards this increased to 85%. The difference between Colombian coffee under PGI and the hypothetical coffee without PGI is on average US$0.38 per pound in favour of the PGI coffee. Prices of international coffees are cointegrated – therefore not independent – with prices paid to growers in Colombia before and after PGI registration (2007), indicating that the PGI has not allowed Colombian coffee to be decommodified.
Darjeeling tea 2004: the first GI in India 2011: registration of the PGI in the EU	Premium compared with substitutes: • between 1991 and 2013, an average premium of INR 60.4/kg and INR 66.9/kg in comparison respectively with Assam and Dooar teas; • price almost double the prices of substitute Assam and Dooar teas in recent years. Price increase: • price increase of 4% between the periods before and after PGI registration in India (2004): from INR 125/kg to INR 130/kg; • significant increase in prices after 2011, when the PGI was registered in the EU: from INR 110/kg in 2011 to INR 153/kg in 2013.
Futog cabbage 2008: registration of the PDO 2012: first certification of the PDO	Premium price of Futog cabbage compared with its substitute, the Bravo variety: • between 2006 and 2011, the prices of the two cabbages were similar; • from 2012, the price difference between the two cabbages increased: - 2012: premium of 18% compared with the substitute (fresh and fermented); - 2013: + 20% compared with the fresh substitute and + 24% compared with the fermented substitute; - 2014: + 16% compared with the substitute (fresh and fermented).
Kona coffee 2000: creation of the "100% Kona Coffee" certification mark	The price of Kona coffee was two to three times higher than the prices of Hawaiian coffees (Kauai, Maui and Honolulu) and as much as five times higher than international coffee prices between 1991 and 2008.
Manchego cheese 1982: national DO 1996: European PDO	Cheese price: • increase in the price paid by consumers: + 45% before/after the European PDO in 1996 (from approximately EUR 10.6/kg before to approximately EUR 15.3/kg after); • increase in the price paid by retailers to wholesalers: + 45% before/after the European PDO in 1996 (from approximately EUR 7.8/kg before to approximately EUR 11.3/kg after); • increase in the price paid by wholesalers to producers: + 45% before/after the European PDO in 1996 (from approximately EUR 6.3/kg before to approximately EUR 9/kg after); • increase in the farmgate price of Manchego milk: + 5.5% between 2005 and 2010 (from EUR 0.91/litre in 2005 to EUR 0.96/litre in 2010).
Penja pepper 2013: registration of the PGI with OAPI	GI registration in 2013 was accompanied by an average price increase of 120–130% between the periods 1995–2013 and 2013–2015, with prices on the international market evolving in a comparable manner.
Taliouine saffron 2010: establishment of the PDO	Increase in prices paid to producers outside cooperatives: • + 40% between 2000 and 2014 (from approximately Dh 11 500/kg in 2000 to approximately Dh 16 000/kg in 2014). Increase in prices paid to producers via cooperatives: • + 500% between 2000 and 2014 (from approximately Dh 3 300/kg in 2000 to approximately Dh 17 000/kg in 2014).
Tête de Moine cheese 2001: national DO registration 2011: the DO becomes a European PDO and is recognized in the EU and Russia	Milk price: • lower decrease in price of Tête de Moine milk, compared with decrease in prices of Tilsiter milk and standard milk, between 1999 and 2014; • average price of milk was EUR 0.71/kg for Tête de Moine milk, EUR 0.67/kg for standard milk and EUR 0.65/kg for Tilsiter milk between 1999 and 2014. Cheese price: • exports: + 57% between 1999 and 2014 in the EU (from approximately EUR 15/kg in 1999 to approximately EUR 24/kg in 2004); • continuous increase on the domestic market: - + 4% between 2001 and 20004 (from approximately EUR 20/kg in 2001 to approximately EUR 21/kg in 2004); - + 5.13 between 2004 and 2014 (from approximately EUR 21/kg in 2004 to approximately EUR 24/kg in 2014); • wholesale price stable: EUR 14/kg between 1999 and 2014.
Vale dos Vinhedos wine 2002: PGI registration 2012: PDO registration	In 2015, the PDO wine price averaged EUR 17/litre, while the non-PDO wine price in the Vale dos Vinhedos area was EUR 13.50/litre and the non-PDO wine price outside the area was EUR 10.50/litre.

Source: authors' elaboration based on data gathered for the study.

4.1 Impacts on price

The implementation of a GI substantially increases the price of the final GI product or its main raw material in all the nine cases studied. As shown in Table 3, the positive effects of GIs on price are considerable, and this result holds regardless of the type of product under consideration (coffee, tea, wine etc.), the region of origin (Europe, Africa, America) and whether the GI has been established for a long time or is recently registered.

There are various mechanisms behind the positive effect of a GI process on price. The first pertains to the ability of GIs to reduce the asymmetrical nature of information between producers and consumers by providing information on the link to origin, and consequently to increase consumers' willingness to pay higher prices. This is particularly true in situations where an official logo is systematically used, the product is certified and there is a system of enforcement to prevent misappropriation of the name, as in the cases of Darjeeling tea, Futog cabbage, Manchego cheese and Tête de Moine cheese (see Table 4). Nevertheless, even in these cases, the reduction of information asymmetry that the logo should provide depends on consumers' awareness, and here there is often a gap to be addressed, even in European countries.

The second mechanism concerns producers' ability, through their collective organization, to modify market organization and intervene on price, either through supply control (restricting volumes when demand decreases and thus keeping the price level as high as possible) or through an agreement among value chain stakeholders to pay a minimum price to producers. The fixing of a minimum price paid to producers can be seen in the case of Colombian coffee (where it is fixed by Fedecafé) and in the case of Penja pepper (where it is fixed by the interprofessional association covering producers, retailers and nursery associations). There is no evidence in our cases of any clear decision to regulate supply in order to push the price up (for example managing the volume of certified production through quotas, storing or grading). However, in some cases the decision to set higher quality requirements leads to a decrease in production (see below). In this regard, the case of Vale dos Vinhedos wine interestingly illustrates how the much higher quality requirements in the new specifications may be strategically decided in order to increase the price of the certified wine, but may also have a positive influence on the price of any wine produced in the valley.

There is then the question of the redistribution of value upstream in the case of processed products and whether the price paid to farmers also increased. The two cheese cases show an effect on the milk price paid to dairy farmers. In the case of Manchego cheese, analysis of the price before and after registration shows an increase of 45 percent at all the links in the value chain (retail price, wholesale price, milk price; see Table 3). In the case of Tête de Moine cheese, the milk price is higher than for other milk (up to CHF 0.10 higher than for milk for the non-GI substitute Tilsiter). In the case of Colombian coffee, analysis shows that the share of the price transmitted to producers increased after registration of the PGI (from 68 to 85 percent of each dollar paid by roasters to Fedecafé). However, more systematic analyses of the other cases would be needed before this positive impact on value redistribution could be generalized, but data were unfortunately not available. In the case of Futog cabbage, for example, it will be interesting to see how the price paid to farmers by fermented cabbage processors will increase in the future with the GI process.

With regard to income, when analysis has been possible (in three cases), it shows an increase, despite increased production costs in some cases. In the case of Vale dos Vinhedos wine, all the PDO wine-makers benefit from a higher income; in the case of Penja pepper, the higher productivity developed thanks to the GI process leads to an increase in producers' income; and in the case of Kona coffee, income increased fivefold between 1991 and 2008. Cost-benefit analysis in these three cases shows that GI producers are better off in terms of profits or margins compared with non-GI producers, implying that a GI adds sufficient value to offset the higher costs.

4.2 Impacts on production volumes

In all the cases studied, except for that of Darjeeling tea, the GI process has affected

Table 4: Capacity of GIs to reduce information asymmetry

Case study	Official label	Certification	Importance of the "signalling" capacity: - not active; + slightly active +++ very active
Colombian coffee	Yes on the domestic market and the EU market when traders are part of the GI strategy	Yes	+
Darjeeling tea	Yes	Yes	+++
Futog cabbage	Yes	Yes	+++
Kona coffee	No: wording on labels may mislead consumers	Public certification on request and to be paid for by producers	-
Manchego cheese	Yes	Yes	+++
Penja pepper	Yes	Not yet in place	+
Taliouine saffron	Yes but not used on the informal market	Yes	+
Tête de Moine cheese	Yes	Yes	+++
Vale dos Vinhedos wine	Yes	Yes, but inconsistent use of the Vale dos Vinhedos name by unauthorized users	+

Source: authors' elaboration based on data gathered for the study.

production volumes (see Table 5), although the effect differs in the short and long terms. "Mature" GIs, where long-term impacts can be observed, show that a GI process increases production in the long term as a consequence of market success and increased demand. Some outstanding cases here are Kona coffee with a 250 percent increase between 1995 and 2015 and 36 percent more producers between 1991 and 2012, Manchego cheese with an 83 percent increase in volume between 2001 and 2013, and Tête de Moine cheese with a 300 percent increase in volume between 1986 and 2014.

In the short term (immediately following registration), GIs can, however, provoke an initial decrease as a result of specifications that directly affect production (specific requirements and delimitation of the production area). This is seen in the case for Vale dos Vinhedos wine, with a reduction of 78 percent in production between 2012 and 2014, following PDO registration. It can also be the result of a reduction in the number of producers using the GI as a consequence of the reservation of the name to the "true" GI product, as in the case of Futog cabbage, where the amount produced under the GI fell by 76 percent between 2010 and 2014. In some cases, however, the GI can result in an immediate increase in production, as in the case of Penja pepper (+ 328 percent between 2010 and 2015), as a consequence of specifications that allow for greater productivity.

A reduction in supply in the short term because of an increase in quality is a result of the adoption of new production technology focusing on quality instead of cost reduction. This entails a period of adjustment to adoption of the new practices and full compliance with the specifications (for example, the requirement of planting new coffee bushes or vines, which need time to become productive). The short-term reduction in supply can also be explained by imperfect compliance with the specifications, with some farmers not being involved in the GI process, although they are located in the demarcated areas. Indeed, some farmers may be geographically eligible since they are located in the demarcated areas, but do not comply with the specifications or are not willing to engage in the GI strategy. In addition, farmers located outside the demarcated areas can no longer supply the product. A reduction in production is therefore seen after

Table 5: Summary of the impact of GIs on production

Case study	Production and number of producers
Colombian coffee 2004: national DO registration 2007: EU registration of the PGI	Short-term decrease of 33% in production between 2008 and 2012. Production increased again in 2013 to recover its previous average level.
Darjeeling tea 2004: the first GI in India 2011: registration of the PGI in the EU	Relatively stable: average production of 10 500 tonnes in the period before the PGI and also in the period after its establishment.
Futog cabbage 2008: registration of the PDO 2012: first certification of the PDO	Decrease of 76.6% in production: from 2 000 tonnes in 2010 to 468 tonnes in 2014.
Kona coffee 2000: creation of the "100% Kona Coffee" certification mark	Increase of 250% in production: from 1 000 tonnes in 1995 to 3 500 tonnes in 2015. Increase of 36% in the number of producers: from 609 in 1991 to 830 in 2012.
Manchego cheese 1982: national DO 1996: European PDO	Increase of 83% in production: from 5 890 tonnes in 2001 to 10 757 tonnes in 2013. Decrease of 44% in the number of farms: from 1 430 in 2000 to 798 in 2013.
Penja pepper 2013: registration of the PGI with OAPI	Organization of the supply chain due to the GI process and the increase in international and domestic pepper prices allowed an increase of 328% in production: from 70 tonnes in 2010 to 200-300 tonnes in 2015.
Taliouine saffron 2010: establishment of the PDO	Decrease of 26% in quantities sold by non-cooperative producers between 2000 and 2014: from 856 kg in 2000 to 631 kg in 2014. Increase of 1 075% in quantities sold by cooperatives and private enterprises between 2000 and 2014: from 29 kg in 2000 to 341 kg in 2014. Increase in the number of cooperatives: from 5 in 2010 to 35 in 2014.
Tête de Moine cheese 2001: national DO registration 2011: the DO becomes a European PDO and is recognized in the EU and Russia	Increase of 300% in production: from 565 tonnes in 1986 to 2 262 tonnes in 2014. Significant and rapid increase in volumes in the years following introduction of the DO in 2001: from just over 1 400 tonnes in 2002 to more than 2 000 tonnes in 2006.
Vale dos Vinhedos wine 2002: PGI registration 2012: PDO registration	Average increase in production of the *Vitis vinifera* grape variety, with an increase of 47.8% between 2001 and 2013: from 50 million kg in 2001 to 73.9 million kg in 2013. Average increase in production of the American/hybrid grape varieties, with an increase of 40% between 2001 and 2013: from 384 900 tonnes in 2001 to 537 300 tonnes in 2013. Average decrease of 78% in certified PDO quantities between 2012 and 2014: from 262 kl in 2012 to 49 kl in 2014.

Source: authors' elaboration based on data gathered for the study.

implementation of the GI process, as in the case of Futog cabbage.

4.3 Impacts on market access and competitiveness

Improved market access has been observed in five cases (Kona coffee, Taliouine saffron, Manchego cheese, Tête de Moine cheese and Darjeeling tea) (see Table 6). In these cases, the GI process has had a positive effect on the number of destinations (an extensive effect) as well as on the value exported (an intensive effect). For instance, the number of destination countries for Darjeeling tea rose from 35 in 2004 to 45 in 2015. With regard to the extensive effect, analysis shows that the positive impact of the GI on Manchego cheese is mainly explained by an increase in the market share from 50 percent in

Table 6: Summary of the impact of GIs on market access

Case study	Market access
Darjeeling tea 2004: the first GI in India 2011: registration of the PGI in the EU	Exports: stability and diversification: • about 70% of production (approximately 7 000 tonnes) destined for export both before and after registration of the PGI in India (2004); • diversification of export destinations: from 35 countries in 2004 to 45 in 2013; • type of contract: approximately 55% auctions and 45% direct sales.
Kona coffee 2000: creation of the "100% Kona Coffee" certification mark	Large volumes marketed as Kona. Quantities assembled: confidential information. 4 040 tonnes of roasted coffee (most of it Kona coffee) exported in 2014. 2 080 tonnes of green coffee (most of it Kona coffee) exported in 2014. Improved access to new markets thanks mainly to online sales by boutique farms on the domestic market but also for export (+ 60% between 2011 and 2014).
Manchego cheese 1982: national DO 1996: European PDO	Increased market share of Spanish GI cheeses: + 5% between 2001 and 2013 (from 50% in 2001 to 55% in 2013) Exports: • a 14-fold increase after the European PDO (1996): from 165 tonnes before to 2 320 tonnes after; • access to new markets: United States.
Taliouine saffron 2010: establishment of the PDO	PDO sales in supermarkets in coastal cities (Casablanca, Agadir and Rabat) benefited from a 137.5% increase between 2010 and 2014, exports managed by cooperatives and companies increased and local stores were created.
Tête de Moine cheese 2001: national DO registration 2011: the DO becomes a European PDO and is recognized in the EU and Russia	Exports (mainly to France and Germany): • + 2427% between 1986 and 2014 (from 55 tonnes in 1986 to 1 390 tonnes in 2014).

Source: authors' elaboration based on data gathered for the study.

2001 to 55 percent in 2013, with access to such new markets as the United States and Germany. In other cases, for example Penja pepper, the GI has allowed consolidation of the position of the product on pre-existing markets (the "origin pepper" market in the case of Penja pepper).

4.4 Impacts on resilience: preliminary findings

In the economic literature, resilience concerns three main abilities: that of recovering quickly from an external shock, that of withstanding the effect of a shock or that of avoiding the shock altogether. Preliminary findings regarding resilience (analysed in the six cases where data were available) show that GIs can be useful tools in building resilient supply chains, as has been seen in four of these six cases (Penja pepper, Kona coffee, Manchego cheese and Tête de Moine cheese; see Table 7). The capacity of GIs to contribute to resilience can be explained in our cases first by their enhancement of market diversification for the product and then by their reduction of dependence on the commodity market and related price volatility.

Market diversification

The extensive effect of GIs on exports increases the number of destination countries.

As observed in six cases (Darjeeling tea, Kona coffee, Manchego cheese, Taliouine saffron and Tête de Moine cheese), the GI strategy seems to improve the diversification of product destinations, thus limiting the dependence on a specific country and increasing the resilience potential to any shock occurring in a given country. The international market would seem to be of great importance in overcoming crises, as in the case of Manchego cheese, which was able to recover its market share rapidly by developing the United States market after the 2008 crisis, which strongly affected Spain. It would be interesting to carry out a fuller analysis of product diversification in relation to GI system

Table 7: Summary of the impact of GIs on resilience

Case study	Resilience
Colombian coffee 2004: national DO registration 2007: EU registration of the PGI	No difference in magnitude of shock absorption before and after PGI registration (2007). Colombia, with Kenya and Tanzania, is part of the Colombian Milds Index, which is not independent of the world market.
Kona coffee 2000: creation of the "100% Kona Coffee" registration mark	The cointegration test shows independence vis-à-vis the commodity market.
Penja pepper 2013: registration of the PGI with OAPI	The interprofessional organization that was set up has allowed implementation of a minimum price for producers, negotiated with distributors each year and covering production costs, thus reducing producers' vulnerability.
Tête de Moine cheese 2001: national DO registration 2011: the DO becomes a European PDO and is recognized in the EU and Russia	Lower decrease in the price of Tête de Moine milk, compared with decrease in the prices of Tilsiter milk and standard milk, between 1999 and 2014.

Source: authors' elaboration based on data gathered for the study.

resilience. In the case of Tête de Moine cheese, for example, producers can benefit from two GI cheese products, illustrating the importance of looking for complementarity between production and the products to be marketed.

Reduced dependence on commodity markets: the "decommoditization" effect

As illustrated by the case of Kona coffee, territorial differentiation based on a niche market limits the dependence of GI prices on international markets and therefore makes them more resilient in the face of any commodity price fluctuations. Although it will need to be confirmed in coming years, the Penja pepper price evolution seems to show some initial disconnection from the international price. The case of Tête de Moine cheese also illustrates this capacity for resilience, with milk for Tête de Moine cheese showing better resistance than milk in general to the fall in price caused by market liberalization in Switzerland in 2001.

With regard to commodity markets, in the cases of Colombian coffee and Darjeeling tea, the GI is clearly used as a way of reinforcing differentiation and protecting a growing reputation on the global market, while not aiming at a disconnection from international prices. Indeed, the GI process offers a "decommoditization" opportunity if and when it is associated with a marketing strategy that targets and develops specific relations with niche markets (through contracts), as is illustrated by the case of Kona coffee. In this perspective, it will be interesting to observe the strategy of regional coffees from Colombia that could be positioned in specific niche markets, either locally or for export, and to test the hypothesis that an internationally successful GI is a well-established GI in the domestic market.

4.5 Impacts at the territorial level: preliminary findings

Employment goes beyond strict economic impacts because of its social dimension, although it still reflects important impacts on the local economy and rural development. No systematic in-depth analysis has been carried out, but exploratory data on the case of Darjeeling tea are interesting: the GI specifications are clearly associated with a large number of local jobs, since skilled workers are needed to ensure the use of traditional manual practices.

Although not analysed as such, links between GI processes and tourism are observed in almost all the cases.

The reputation of the product can be the basis for the development of tourism activities: the

case of Colombian coffee illustrates the synergy between the value chain strategy and a territorial strategy based on heritage recognition (UNESCO world heritage) and tourism development (a coffee park). Similarly, the typical Darjeeling tea plantation landscape represents an important tourism asset, with large numbers of local and foreign tourists coming to visit the area, using the special train. No specific attractions have been built in the case of Kona coffee, but a visit to a coffee plantation and the purchase of some Kona coffee on a boutique farm are musts for tourists in Hawaii. In the case of Vale dos Vinhedos wine, the promotion strategy for tourism was also a tool for the promotion of local wine, and the GI process has strengthened this synergy, with the development of a wine trail and tastings of officially recognized wines.

In the case of Taliouine saffron, the typical product is also an asset for the development of rural tourism, in which typical saffron meals and tea are appreciated by local and foreign tourists.

Clearly the reputation of the product serves the reputation of the territory in the form of tourism development, and this can provide the basis for an extended territorial strategy, where not only value chain stakeholders are mobilized for the promotion of their product, but also local players from other goods, services and authorities to optimize positive externalities.

Through a domino effect, GIs can have a substantial positive impact on other sectors of the economy. Various types of externality from GI processes can thus be observed across the cases:

- an increase in the price of substitute products, as in the case of Futog cabbage, where the price of substitute Bravo cabbage has risen significantly with PDO registration (from RSD 8.62/kg to RSD 11.83/kg on average); the same is seen in the case of Vale dos Vinhedos wine, where all the wines produced in the valley benefit from the reputation of the valley;
- the spread of innovative practices to non-GI producers, as is seen in the cases of Penja pepper and Vale dos Vinhedos wine, where the GI process allows development of the activity even for non-GI producers; thus the number of producers increased in the Penja pepper area by 728 percent, and also in neighbouring districts (746 percent in Bouba, 800 percent in Loum Gare etc.), with the boom in international and domestic pepper prices also explaining this increase;
- the GI process can point the way for the development of other GIs, as in the case of Colombian coffee, where many other processes have been initiated since the coffee GI registration in 2004, so that there are currently 23 GI products, 11 of them non-agricultural; a similar phenomenon was observed after registration of the Vale dos Vinhedos wine GI in Brazil.

Chapter 5 – Synthesis of causal mechanisms and success factors

Analysis of the nine cases allows confirmation of the success factors identified in the literature: a specific quality formalized in the specifications or code of practice, a capacity for collective action and good governance, an effective marketing strategy and a legal/institutional framework.

5.1 Specific quality and specifications

Quality differentiation emerged clearly as a way of generating positive economic impacts for farmers, especially in terms of price (in all our cases, the prices of the GI products are higher than those of their respective non-GI equivalents). Based on our findings, the income of farmers or processors is also impacted positively, because (in the four cases analysed in this perspective) the production costs remain below the selling price.

Specific quality differs from generic quality (which is related to compulsory requirements to enter markets, in particular, product definition and food safety aspects) and refers not only to characteristics of final products such as improved texture, appearance or taste, but also encompasses production practices and other characteristics relating to the production area, for example, specific cultural features (such as traditional meals or events).

The link between price and the quality defined in the specifications involves a variety of mechanisms:

- relationship between the specific (exclusive) quality and consumers' willingness to pay;
- innovations requested for quality and their dissemination as promoted by the specifications;
- recognition of the roles of primary producers in the specifications and implications in terms of the redistribution of value upstream;
- description of practices to ensure specific quality in the long term.

Specific quality and exclusive quality

The positive effect of the GI on price and income is at least partially, whether directly or indirectly, due to the quality effect that allows consumers to identify a real advantage for themselves when purchasing the product. This is why the specific quality must be really specific, i.e. it cannot be substituted. Indeed, the key element for added value is the specific quality that origin bestows and that is the basis of the differentiation strategy to enter territorially-based niche markets (Bramley, 2011). In this perspective, typicality represents a unique opportunity in a globalized market to offer a specific quality that satisfies buyers and consumers.

There is a proportional relation between the level of requirements and the increase in value, or at least they follow a similar line of increase or "scale of exclusivity". The "GI exclusivity strategy" refers to definition of the level of and types of requirement in the specifications that will affect the specific quality level compared with that of non-GI products, with a resulting greater level of willingness to pay. Depending on the capacity of local producers to meet the requirements, this will also be linked to the issue of exclusion (see section 6.1). We can use two contrasting examples to illustrate this. On the one hand, the objective of the Taliouine saffron PDO is to allow all producers in the area to use the PDO, and the specifications accept all existing practices. Similarly, the Colombian coffee GI aims at ensuring benefits to all producers, while more exclusive quality is being developed under regional GIs. On the other hand, the Tête de Moine cheese GI focuses on "exclusive quality", with the specifications accepting only cheeses (a) made with raw milk coming from less than 25 kilometres from the dairy and (b) aged for 60 days. The case of Futog cabbage provides another example of an exclusive quality strategy, associated with a low production variety, as does the Vale dos Vinhedos wine PDO, which accepts only wine-makers who have invested in

the *espalier* system and use a restricted number of varieties with lower yields. Producers' groups therefore have to decide on the appropriate strategy, balancing the level of price increase and the number of beneficiaries.

Innovations that boost impacts

In all the cases, the GI process calls for and supports innovation – technical innovation through the specifications and institutional innovation through the establishment of new types of role and new relationships among stakeholders, producers and others.

Vale dos Vinhedos wine and Penja pepper are cases where technical innovations introduced thanks to the specifications are particularly important, differing considerably from pre-existing practices (Fournier *et al.*, 2016). Innovation does not mean that traditional practices that create the specific quality are reduced, although this must be carefully assessed when defining the requirements.

Specifications introducing innovative practices can indeed make the product more competitive, so long as this does not affect the specific quality and image. Two categories of innovation can be observed: (a) to upgrade the quality in order to meet market requirements or consumer demand; or (b) to adapt some practice or practices to make them more productive. An example is seen in the case of Penja pepper, where economic impacts are clearly linked to innovations made with a view to increasing productivity and competitiveness, supported by implementation of the GI. The case of Vale dos Vinhedos wine illustrates innovations in production practices to improve quality. The case of Tête de Moine cheese illustrates another type of innovation that supports strong differentiation and related economic impacts. The innovation here is related more to market demand (even induced demand) and the way the cheese is sliced with the *girolle* (a special cutter or scraper with an axle that is inserted into the centre of the cheese and then turned to produce rosettes), as illustrated in the logo of the GI and mentioned in the specifications with the rosette as a specific attribute.

From this point of view, GI processes can be seen as innovation drivers to facilitate rural transformation and lead to more sustainable development (FAO, 2016; Durand and Fournier, 2015). From this perspective, it is important to consider the time factor as an ally, as time is needed to build trust among stakeholders, improve some practices, empower local stakeholders and resolve conflicts. Long-established cases, such as those of Manchego and Tête de Moine cheeses, illustrate how the GI strategy is a long-term investment, allowing flexibility over time to adapt to changes in the market or in production.

Recognition of the roles of primary producers in the specifications and implications in terms of the redistribution of value upstream

Upstream redistribution of added value as far as the primary producers is not automatic. The case of Futog cabbage illustrates the fact that there is a risk that added value will be kept at a stage closer to the market (in this case, the processor) instead of being redistributed at farmer level, as a result of power relations within the value chain (in this case, a single producer is able to process the cabbage, creating a monopoly situation). The power of the producers (farmers and processors) is vital in order to negotiate a fair economic return upstream, reaching as far as the growers. The GI system can be a tool to strengthen such power by recognizing the specific role of primary producers in the supply of specific – and therefore non-substitutable – raw material to obtain the GI product. The specifications represent a crucial tool in ensuring the pay-back effect for farmers and producers by specifying their specific roles in providing the unique natural and human resources. They bind the GI value chain to some primary producers, who therefore have a say in negotiating price and more generally in managing the GI.

When this happens, GI strategy is seen as a way of "re-shaping relationships along international supply chains" (Quiñones-Ruiz *et al.*, 2015), offering an opportunity for local producers to define their own standard, as opposed to other voluntary standards and certifications[8] that are

8 For example, in the coffee sector, these voluntary standards are: Nespresso AAA Sustainable Quality (AAA), Starbucks Coffee And Farmer Equity Practices (C.A.F.E. Practices), 4C Association, Organic, Fair Trade, UT and Rainforest Alliance (Potts, 2014).

most often driven by downstream stakeholders, who impose them on the growers (Quiñones-Ruiz *et al.*, 2015; FAO, 2014).

Formalization of practices or methods to ensure specific quality in the long term

The case of Kona coffee provides an interesting lesson regarding the way the specific quality is defined in the specifications, with potential impacts on reputation. Unlike the other cases, where the specifications describe not only the characteristics of the final product (corresponding to the obligation of result, or the "liability approach"), but also the practices (how the specific quality is obtained, or the obligation of means or the "due care approach"), the official documents providing the requirements for use of the Kona coffee GI, the Hawaii-Grown Coffee Law and the associated Standards for Coffee, do not define any specific methods or practices, but only the final quality of the beans (such as "good green colour, good aroma and flavour") for any of the Hawaii coffees, including Kona (i.e. obligation of result). In practice, the interviews show that producers are familiar with the necessary specific practices adapted to their area and how to implement them, although they are not laid down by law. This raises the question of whether referring only to the obligation of results may place the long-term reputation and specific quality of the product (and thus the price increase and its sustainability) at risk if producers are not obliged by law and may thus change their practices in the course of time. The story of some cheeses in Europe (Cantal, Fourme d'Ambert etc.) shows that the obligation of results is sufficient so long as the practices do not evolve too much from the traditional ways of producing the specific quality, but that when this has happened, it has put the reputation (and thus the willingness to pay and the added value) at risk and led producers to describe methods in fresh specifications (Jeanneaux and Meyer, 2013; 2010).

This is why it seems important for the common rules governing practices to allow for adaptation to change, not only internal (for example, the need for innovation) but also external (for example, market and consumer demand). Some of the case studies indicate that stakeholders can change the specifications when they see a new competitor trying to muscle in and obtain the added value. This shows that the specifications are not set in stone. In the case of Manchego cheese, changes in the specifications favour more productive practices and therefore large-scale players may gain more power in relations among the various types of stakeholder.

To conclude, the way the specific quality is defined in the specifications (with the related requirements in terms of practices), taking the above factors into account, depends on the type of product and the producers' strategy. When the strategy aims primarily at defending a strong reputation against unfair competition, the reputation is long established and in our cases is linked to specific practices, all already enshrined in the specifications. This is different from the "offensive" approach, where the strategy is to establish the reputation of the GI product more solidly. In this case, the reputation must be strengthened.

5.2 Collective action, value chain and governance

Local resources provide the basis both for the differentiated physical components of the final product and for intangible and symbolic attributes (Barjolle et al., 1998; Belletti et al., 2015). Such an activation of local resources represents a social construction process (Casabianca et al., 2011) that relates to producers' collective willingness and coordination for a collective differentiation strategy.

Because of this collective nature, the GI process strengthens collective action in the area by bringing the various stakeholders together, as is observed in all cases. The level of governance can be related to the types of action and levels of economic impact.

On the one hand, horizontal coordination allows for a shared view of quality definition and management and economies of scale in terms of production, processing and marketing. On the other hand, when stakeholders share their vision vertically along the value chain, this allows for a strategy of the distribution of added value (fixing of a minimum price, as in the cases of Colombian coffee and Penja pepper).

Some cases, such as Manchego and Tête de Moine cheese, Colombian coffee and Penja pepper, clearly demonstrate the running of well-established interprofessional associations. Formal interprofessional associations bring together vertical and horizontal organizations, ensure efficient coordination among stakeholders and provide a strong governance structure with powerful effects. In the case of Penja pepper, for example, the GI organization (covering input suppliers, producers and traders) is very young but already provides agreement on minimum price, the collective purchase of inputs for production etc.

To summarize, formal organization of the collective decision-making process leads to services for its members, leading in turn to market success in many dimensions:

- quality enhancement: a strong GI organization enhances the certification independently of the national context and the size of the GI system; in many cases, the organization plays a role in quality management, in particular by providing excellent traceability and guarantee systems, as demonstrated by Colombian coffee, Darjeeling tea, Futog cabbage, Manchego and Tête de Moine cheeses and Vale dos Vinhedos wine;
- increased bargaining power of groups of stakeholders, in particular for producers vis-à-vis downstream players;
- market information: GI organizations may organize transparency in the market, as is seen in the case of Colombian coffee, where the National Federation of Coffee Growers (Fedecafé) regularly publishes green coffee market prices to farmers;
- economies of scale in providing services or goods (in production or in promotion to reinforce the signalling aspect of GIs);
- public support: in some countries, public aid can be conditional on a collective organization of producers (as in the case of Taliouine saffron, where subsidies are given to cooperatives and economic interest groups to support certification).

However, the bargaining power of producers vis-à-vis downstream segments of the value chain is sometimes weak. In the case of Futog cabbage, for example, the unique processor is in a position of monopoly; this may weaken the GI system if the major part of the added value is retained at the processor level. In the case of Manchego cheese, the recent change in marketing strategy, which benefits large-scale producers over smaller traditional ones, weakens the link to origin, making it potentially less sustainable in the long term. Lastly, in the case of Colombian coffee, although the national federation is very strong and is fair towards small-scale producers, long data series show that an increase in the domestic price is less reflected in the price paid to producers than is the decrease in the international price, because Colombian coffee remains a commodity in the sense that it remains dependent on the international market price.

This sheds light on an important aspect: the organization is not in itself sufficient, but needs time to build capacities and trust among stakeholders and achieve the necessary local combination of cooperation and competition ("coopetition") (Dagnino and Padula, 2009). The case of Taliouine saffron is a good illustration, where public support was given to improving the structure of the value chain and establishing a large GI organization: the number of cooperatives increased sevenfold between 2010 and 2014, and an overall GI organization has been created (encompassing all cooperatives, economic interest groups and companies). Public support consolidated the structure, but now stakeholders need to gain experience in running the GI (the PDO is recent, registered in 2010) in order to enhance existing positive economic impacts. Similarly, in the case of Penja pepper, trust over management of the GI needs to be built up, especially over the certification that still needs to take place, so as to retain the current positive results in the long term.

5.3 Effective marketing efforts

One key role of the GI organization is to define and manage the collective aspect of the marketing strategy. This collective action is complementary to the individual efforts of the GI stakeholders, who continue to manage their own marketing strategy in parallel.

Throughout our study, we can observe how the stakeholders' engagement in marketing efforts influences economic impacts.

(1) Branding the GI

Many cases show that the capacity to build agreements with downstream operators is vital for economic impacts. It boosts the visibility of the GI product and the correct use of the registered name of the product at the point of sale. This is particularly important in cases where the GI system has been developed mainly among producers, either because the GI essentially covers the production stage, while processing takes place outside the production area (for example, roasting for Colombian coffee), or because farmers and processors do not sell directly to consumers, and retailers are not interested in the GI strategy but are more interested in retaining their bargaining power. An interesting example is provided by the strategy of the Colombian Federation of Coffee Growers aimed at making the signal to consumers more effective. First, the specifications cover the final coffee – without being specific on quality requirements at this stage – and, second, use of the GI by the final market operators is conditioned by an agreement between the federation and the company in order to ensure some compliance with the branding strategy (use of the name linked to compliance with the specifications).

(2) Targeting niche markets

Our cases show that marketing strategy is driven by the types of GI approach (offensive or defensive) and marketing channel (niche or mass). The best economic impacts in terms of prices are when the GI organization focuses its strategy on managing supply volumes to prevent prices from falling due to a major increase in volumes, which then exceed demand. This is also linked to the destination market and whether it is a niche market (likely to be so for small volumes) or commodity market (likely to be so for large volumes). The relation to volume and number of producers is also linked to the "exclusive quality" approach taken in the specifications (see 5.1), which influences the type of marketing channel, niche markets being more likely to be related to exclusive quality, while mass markets will relate to less exclusive quality. In this regard, the cases of coffee – Colombian and Kona – provide interesting insights. Colombian coffee (like Darjeeling tea) still behaves as a commodity on the international market as a result of the large volumes sold on the global market (thus setting the international price). Kona coffee, on the other hand, has developed a strategy to position the coffee on niche markets, in this way remaining independent of international market prices.

In some more recent cases, the strategy is not yet clear. For instance, the Penja pepper organization could still decide to invest marketing efforts in niche markets, positing origin pepper as an exclusive product (like Kampot pepper from Cambodia, which targets chefs), or to continue competing on the pepper commodity market. Another example of such an undecided position is Taliouine saffron, which has not yet focused on a clear niche market strategy. Exclusivity is associated with lower volumes and potentially higher prices, but benefits fewer producers compared with a non-exclusive strategy. One or the other strategy may be more appropriate according to the situation, or the choice could depend mainly on the decision of the producers engaged in the strategy.

(3) Accessing new markets

Thanks to its well established registration, the case of Manchego cheese provides a long period of GI process for observation and illustrates how the specifications can serve an evolving marketing strategy. Initially developed by small-scale producers to differentiate their cheese made from milk from local breeds of sheep from other cheeses and prevent misappropriation of the name, the specifications have been revised twice to facilitate access to new markets. The producers' group decided to make the first changes to the specifications in 1995 to allow a smaller size of cheeses in order to satisfy demand. Then in 2008, the decision was made to increase exports in order to face the national economic crisis, and the organization obtained fresh changes in the specifications, in relation this time to production practices. The new specifications allow sheep to be fed more concentrates. New large-scale operators have entered production, which has supported rapid

development of export markets, especially in the United States. This has had an impact in terms of an increase in volumes.

5.4 Legal framework and role of the public sector

A sound legal system for IPR protection and for promotion is a key success factor. As protection of an IPR, the GI process improves market efficiency by limiting unfair competition and free-riding behaviour through the enforcement of GI legal provisions. This allows a lower risk of devaluation of the product through imitation and consequent consumer confusion. This kind of risk arises when producers do not respect the same production rules and therefore do not have the same production costs and can offer similar products at a lower price. Such unfair competition exerts pressure on producers offering the quality that really satisfies consumers and supports the reputation-building process for the product. When protection is adequate, the price increase is maintained, because competitors located in the area of origin have to meet all the conditions laid down in the specifications and therefore face the same costs if they wish to enter the GI system, while competitors located elsewhere are totally excluded (Barjolle and Jeanneaux, 2012).

Another way in which the legal system affects market efficiency is in the capacity to reduce asymmetrical information, thanks to the provision of information to consumers, in particular through official national logos or seals and public campaigns to inform consumers regarding GI concepts.

This is particularly illustrated in the "old European" cases of Manchego and Tête de Moine cheeses, but also by the cases of Colombian coffee and Darjeeling tea, where the legal and institutional frameworks seem to provide all the necessary functions and clear information to users in order to protect producers and consumers. The fact that the GI legal and institutional frameworks are long established has allowed stakeholders to learn collectively and function smoothly.

In the other cases, the legal and institutional frameworks are more recent and a learning process is ongoing at the institutional level. The main difficulties appear when it comes to certification of products and the use of GIs, for example (a) the long time needed to establish the certification system in the case of Penja pepper, (b) the reduced number of producers involved in the Futog cabbage process in Serbia, many of them preferring to wait and see until they can really understand the advantages and disadvantages, since official procedures may not be sufficiently clear at the moment, and (c) the lack of clarity about the simultaneous use of a PGI and a PDO in the case of Vale dos Vinhedos wine. These weaknesses in the legal implementation of GIs have been identified as factors hampering the economic impacts of the GI process.

Kona coffee is a special case as a result of the non-unified understanding and system for administering GIs in the United States (Barham, 2011), where they are for food products, which are generally protected under trademarks. The Hawaii Department of Agriculture offers the possibility of using the GI not only for the 100 percent product but also for lower percentage products with as little as 10 percent in the final blend. This leads to a variety of products under the Kona GI, which may mislead consumers (and could create distrust at some point) and leads to conflicts in the value chain. Although a higher price can be observed for all Kona coffee compared with other Hawaii coffees, we can assume that this premium would be less if the GI were reserved for 100 percent Kona coffee. Currently, growers defend a low volume for the GI reserved for 100 percent Kona coffee, hoping for a high price, and do not care if the turnover for the entire supply chain is low. Traders defend a high volume reserved for 10 percent Kona coffee at a lower price, but still with a premium and with a relatively high turnover for the supply chain. Today traders have the upper hand in view of the economic advantage for the Hawaii State. The success factor in this case appears to be important niche markets that value the cultural assets associated with the Hawaii production area: first, there is the domestic market, with direct sales and tourism (boutique farms); and, second, for the traders, the driver of their success is the strong market demand in Japan and other American states.

Another function of public players is to support GI development so as to enhance its contribution to public goods (FAO, 2009). Various situations can be observed regarding the role and importance of public intervention:

- **Public support for GI development and promotion from local and/or national authorities**. This is the case for Tête de Moine cheese for which the interprofessional association receives significant public financial support for advertising, and also legal enforcement of its decisions when reached by a majority vote, if needed. Vale dos Vinhedos wine receives support for development of the PGI and the PDO. Kona coffee has been strongly supported by the Hawaii Department of Agriculture for creating and registering the trademark. In the cases of Futog cabbage and Penja pepper, strong public aid was provided during their establishment phase, as public authorities (the Serbian Government and the African Intellectual Property Organization) participate in the cooperation project supporting their development. In a broader perspective, it is important to note that Serbian and Cameroonian GIs do not currently benefit from public GI support policies.
- **Strong public-private coordination in GI management**. This is the case for Colombian coffee, where export fees are managed by the National Federation of Coffee Growers for investment in the value chain, while GI strategy has been discussed and approved by public authorities. Similarly, in the case of Manchego cheese, local authorities are members of the regulatory body.
- **Direct involvement of public players in the GI decision-making process**. The case of Darjeeling tea is unique, inasmuch as public authorities directly manage the GI system through the Tea Board of India, in collaboration with the Darjeeling Tea Association, which was created in a second stage. Taliouine saffron may also fall into this category, as local authorities (who presented the application for registration) and national authorities (through large-scale funding and attendant conditions) have shaped the GI system.

These observations show that public authorities always play a role at some point and some level in support of GI development. The support takes different forms depending on the context and history of the case, as has already been observed in other contexts (Biénabe and Marie-Vivien, 2015; Durand and Fournier, 2015). Such involvement is beneficial for GI development, especially in the initial stage (to support the first certification costs as in the cases of Futog cabbage or Taliouine saffron). In a long-term perspective, the empowerment of local stakeholders is crucial. Otherwise, poor understanding and/or low power of decision over the GI system will lead to strategic failure, since producers will not be able to manage the system alone.

5.5 Investment capacity, territorial dynamism and size

As highlighted in the background section, investment capacity and territorial dynamism can also be considered as success factors for GI impacts, although not independent of the governance and policy support aspects.

The importance of local support and investment as key elements in initiating the GI process is demonstrated particularly clearly in the cases of Futog cabbage, Penja pepper and Taliouine saffron. The capacity of the GI organization and producers to coordinate with local operators may boost rural development, with impacts on other local activities (the production of other goods and services, tourism). In this regard, the case of Vale dos Vinhedos wine is very interesting, inasmuch as it shows how such a strategy can pre-exist and determine the GI process. In the case of Darjeeling tea, the expansion of tourism around tea gardens, linked to the splendid landscape offered by the tea plantations and the tea "culture", is a good example of what can be developed in this sense.

Lastly, the size of the production system would not seem to be an issue for GI success, depending on the type of GI and the market segment. This is shown through the case of Futog cabbage, which represents 0.5 percent of total Serbian cabbage production and benefits from added value.

5.6 A roadmap leading to economic impacts

Building on the nine cases, the economic impacts and key steps in the GI process, starting from local resources and a willingness for collective action to obtain benefits for the whole area, can be synthesized in a roadmap leading from the potential of a GI product in a given area towards economic impacts and externalities for rural development.

The potential economic impacts of a GI process are shown in Figure 2.

The GI process starts with the social construction of the product typicality when local stakeholders, particularly farmers and processors (the "producers' group"), decide to develop a collective strategy to preserve and/or promote their origin-linked product (in the diagram "social construction of the product typicity and coordination of stakeholders"). The producers' group first discusses and defines the common rules. Existence of specific natural resources, specific know-how and willingness to act collectively are the main pillars supporting the emergence of the GI process. All these elements (in red) are preconditions for official recognition and registration of the GI (in blue). During the GI process, two "coordination tools" are the main outputs of the discussions between the local stakeholders: the specifications (code of practice) and the GI producers' collective strategy concerning production and marketing (in orange). The specifications lay down rules as to the level of agricultural production and post-harvest techniques and define the production area.

The registration and official recognition of GIs have two institutional impacts (in grey). They formally bind local economic operators to governments that recognize the GI, bringing (i) public-private coordination (and, depending on country and policy, some public support, even financial, to facilitate GI development) and (ii) legal protection of the GI, with possible action to counter misappropriation of the name and the misleading of consumers.

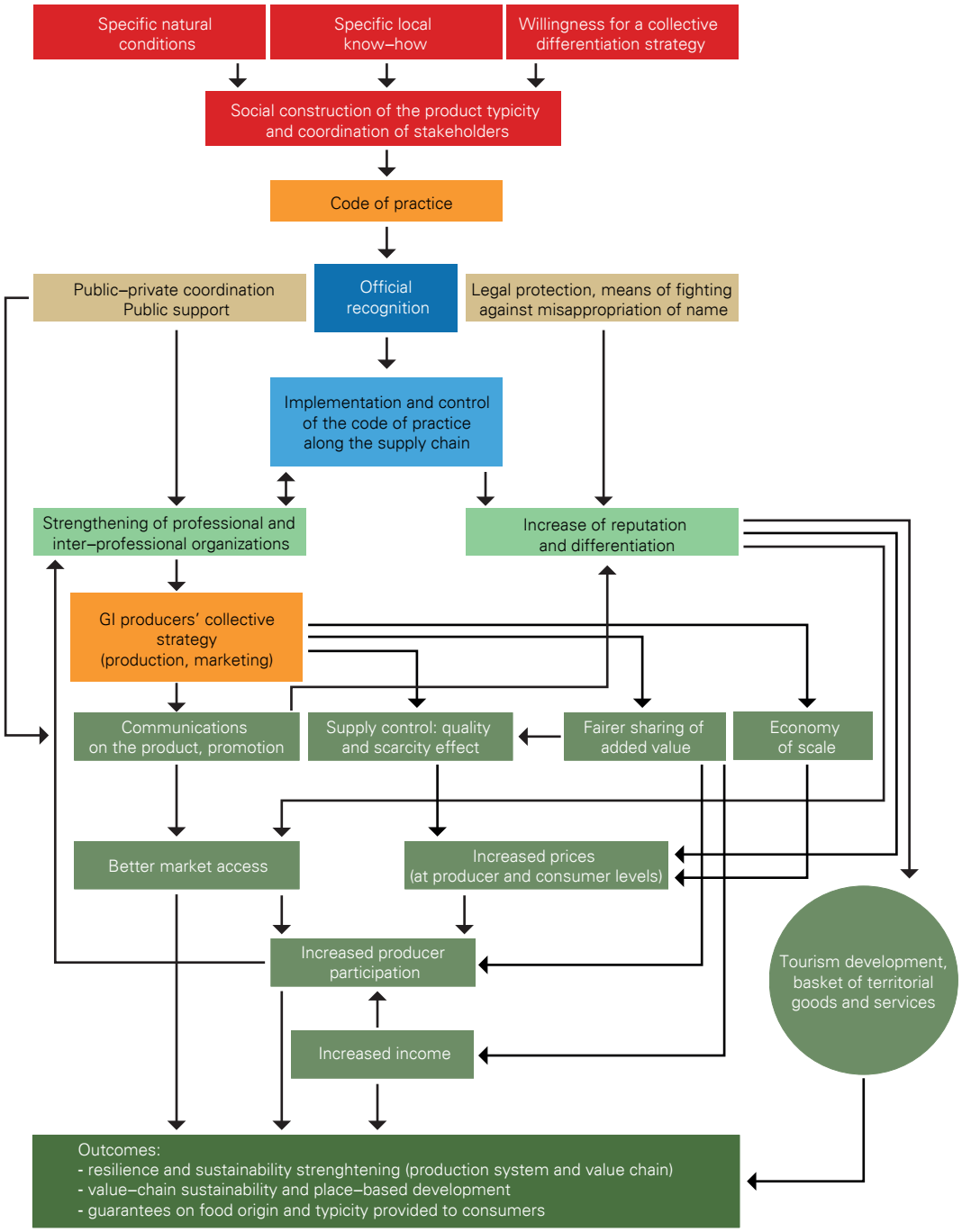
Induced impacts (in light green) derived from implementation and control of the specifications in the supply chain (in light blue) are as follows:

- Increased reputation and differentiation: the struggle against misappropriation and misrepresentation can boost the product's reputation and differentiation, which may have been tainted by possible counterfeiting. Associated with effective control of the specifications, this may provide consumers with stronger guarantees on the geographical origin and characteristics of the product, so that they are then inclined to pay a higher price for the original product. In cases where the GI did not have a previous reputation, registration supports the creation of this reputation. Consumers can recognize a specific quality through such a signal, and their willingness to pay may also increase.
- Strengthening of professional and inter-professional coordination within the GI value chain allows the development of a GI producers' collective strategy, covering all the GI system components. This collective strategy allows coordination of action in the fields of production, communication and pricing policy, resulting in efficient promotion of the product, control of the supply and a fairer sharing of added value.

These mechanisms lead to economic impacts (in medium green, with the "final" impacts represented in dark green). The price increase makes the GI more attractive for local producers, who may initially be reluctant to pay certification costs and in some cases to change their practices to comply with the specifications. The increase in the number of producers and their contributions and in the quantity of certified products may provide the GI organization with additional financial resources for (i) establishing efficient monitoring and traceability systems and (ii) carrying out promotional and communication activities on the product. The reputation of the product grows through these two processes, and a virtuous circle appears.

Collective agreements made within the formal GI organization may create economies of scale and bring about changes in the distribution of added value in the GI sector (fair sharing) and collective supply management to ensure quality, avoid crisis overproduction (supply control) and sometimes create a scarcity effect, pushing the

Figure 2: Potential economic impacts of a GI process



Source: authors' elaboration

Key:

- The mechanisms at work raising the GI process: red
- "Coordination tool": orange
- Institutional impacts: grey
- Economic impacts: green (light to dark for the direct, indirect and final impacts)

price up. Both phenomena make the GI sector more attractive in the eyes of local producers, who then adhere to the GI in greater numbers, reinforcing the virtuous circle. The increase in GI prices can have significant effects on producers' income, even after the potential additional production and transaction costs are deducted.

Other economic operators in the area or outside it can also benefit from an improved income (in green circle). In fact, the GI value chain can have externalities for other local goods and services, these effects being particularly substantial if the reputation and consumer recognition of the GI product are strong.

The GI product can participate in such elements of territorial strategy as "baskets of territorialized goods and services" (Hirczak *et al.*, 2008) that generate other externalities for the area in relation to tourism and local consumption. This can lead in turn to a local development phenomenon (in dark green) able to slow down the rural exodus and the marginalization of rural areas. When it works, a GI can be a powerful regional planning tool. Outcomes also cover consumer welfare, with guarantees over food quality and origin and the preservation of dietary diversity.

Chapter 6 – Trade-offs

The case studies also converge in the identification of some important trade-offs, which should be taken into account to facilitate appropriate decision-making in the GI strategy and process.

The case studies converge in the identification of trade-offs to be taken into account when developing GI processes, so that informed decisions can be made on strategy in relation to the issue of exclusivity versus inclusion; the top-down versus the bottom-up approach in some cases; and the economic versus the environmental in the case of major market success.

6.1 Exclusivity versus inclusiveness

A differentiation strategy is based on excluding those outside the strategy from those inside. Specifically, a GI process normally excludes producers outside the GI area and also those inside but not complying with the specifications. The trade-off issue is not about exclusion in general, but the exclusion of producers within the area who are willing to participate in the GI process but are unable to comply with the requirements set out in the specifications.

As described earlier (see section 5.1), the "exclusivity strategy" refers to the levels and types of requirement affecting the specific quality and consumers' willingness to pay more. The exclusivity strategy may therefore lead to the incapacity of some producers to meet the requirements, either as a result of practices that differ from those in the specifications (for example, when traditional practices are opposed to more industrialized ones) or because of a level of basic quality lower than that expected of a "quality product" (for example, in terms of hygiene or packaging).

What is certain is that the requirements should not exclude producers who contribute to the specific quality and image of the product.

In defining the core elements of typicality, specifications should recognize the local practices on which the specific quality has been built through the generations, thus usually recognizing the key role of traditional and/or small farmers. This is why specifications should usually be adapted to the small farmer's situation, in this way reducing the risk of exclusion due to non-compliance, and even making farmers more competitive by raising costs to rivals who have to bear a "leadership strategy cost" (Barjolle and Jeanneaux, 2012). On the other hand, if a GI seems not to favour small producers, this raises questions about the enforcement of the legal/institutional framework and should be adjusted.

From a theoretical point of view, the exclusion capacity can be linked to the vision of the GI group functioning as a "club". Based on the neoclassical economic theory and the club theory of Buchanan (1965), some authors consider the GI, which is a collective IPR, as a club good (Torre, 2002). A club good is characterized by voluntarism, sharing, exclusivity (unique quality) and exclusion thanks to institutional barriers. In order to protect their collective advantage, the members of the club organize themselves to build barriers to entry to their club, thus allowing members of the GI to "enjoy advantages denied to non-members" (Torre, 2002). This capacity offers the members of the club the choice of moving forward either as a monopoly or as an open local team. If entry to the club is open, the monopoly effect is no longer operative. Therefore, in most of the GI regulations, open entry is strictly mandatory: every producer who complies with the specifications has the right to produce without other restriction than participating in the costs of the GI collective running.

A balance needs to be struck between the level of added value to be generated by the GI process (linked to the level of requirements) and the number of beneficiaries (the level of exclusion). The case of Penja pepper provides interesting insights on how to avoid "quality-exclusion" and succeed in ensuring both equity (no unfair exclusion) and economic impacts (requirements ensuring high quality) (Belletti, 2016). If the recent process of establishing the interprofessional

association shows the leading role played by larger producers who have the investment capacity, while not all small–scale producers yet participate in the process, the specifications developed allow efficiency and equity to be properly balanced in the GI process, not only through the types of requirement but also the way they have been agreed upon among stakeholders: the level of requirements ensures higher quality, leading to improved market access, but producers are also given a transition period to comply, while technical assistance and capacity-building is provided (Belletti *et al.,* 2016). The future will show whether inclusiveness is improved so that small-scale producers will also benefit.

The case of saffron illustrates an inclusive strategy, a "GI for all" that avoids exclusion. And this is fine so long as all the saffron can demonstrate a specific (and minimum) quality, because otherwise the GI reputation may suffer in the middle term. A key success factor of the inclusion of small-scale producers is the good relations between the various stakeholders in the value chain (not the absence of conflicts, but the capacity to find compromises), as both large and small have a contribution to make.

Lastly, it seems important for the common rules governing practices to allow for adaptation to change, not only internal (for example the need for innovations) but also external (for example, market and consumer demand). Some of the case studies indicate that stakeholders can change the specifications when they see a new competitor trying to muscle in and obtain the added value. This shows that the specifications are not set in stone. In the case of Manchego cheese, changes in the specifications favour more productive practices and therefore large-scale players may gain more power in relations among the various types of stakeholder.

6.2 Public/private coordination: bottom-up approach versus efficiency

As described earlier, GIs are primarily legal tools for IPR protection and differentiation tools in the market, with a leading role for local producers (FAO, 2009). However, by their nature, GIs are also tied to the provision (or support the provision) of many public goods: territorial reputation (Begalli, Capitello and Agnoli, 2015), natural and cultural resources, the local community and its consumption habits, preserved or increased quality, and economic and social effects on the area (job creation, income, social cohesion) (Belletti *et al.*, 2015).

This is why public authorities may decide to provide strong support to a GI process in order to improve the efficiency of the process, especially when they need to fit in with the timeframe of a project and facilitate its benefits in terms of sustainable development. This is particularly frequent in contexts where small-scale players need some support to start a GI process, as in the cases of Penja pepper and Taliouine saffron, or where there is a lack of awareness in general in countries where GIs are recent, as in the cases of Futog cabbage and Vale dos Vinhedos wine.

When public authorities intervene strongly and provide incentives to the process in order to compensate for producers' lack of capacities and knowledge, there is a risk for long-term viability if local players, especially producers, do not assume ownership in the medium term. Such a process can sometimes be perceived as a top-down approach, although a bottom-up approach is not possible at the very start because it may take too long to empower local stakeholders with no assurance that a GI process may start. There is thus a trade-off between getting most of the GI benefits in a shorter time, and letting local stakeholders lead the process.

A way of escaping this dilemma is to consider an exit strategy from the very start for the public and external players supporting the process and to view the empowerment of local people as a central activity, with a plan for the transfer of leadership. In this perspective, it is also important to consider the "capabilities" dimension of sustainable development, as described by Sen (1999; 2013) (i.e. the capacity and freedom of a person to act in a way to achieve his/her objectives).

On the basis of our case studies, public-private coordination can be seen as a learning process until the right balance is found between the economic/marketing component and public intervention, so that the GI process becomes a

unique way of combining a collective marketing tool (a market approach) with the management of the cultural and biodiversity heritage (a public goods approach) (Vandecandelaere, 2016), and a driver to structure development projects (Van de Kope, 2006).

6.3 Uncontrolled economic success versus environmental sustainability

As mentioned earlier, GIs can be drivers for rural transformation leading to more sustainable development (FAO 2016; Durand and Fournier, 2015), first because economic sustainability is an important step towards environmental and social sustainability: positive environmental and social impacts of GIs cannot be supported if producers have to abandon their practices to be more competitive. A second reason is that the specifications can directly influence environmental sustainability, depending on the requirements that are considered (local species or breed, specific agricultural practices etc.).

Tailored specifications allow identification of the best sustainable practices to preserve the specific local resources, particularly local breeds and species that affect the specific quality of the GI product (Vandecandelaere, 2016). The case of Futog cabbage illustrates well how a GI process aimed at preserving an ancient and less productive variety can have an economic impact, as does the case of Manchego cheese, which allows preservation of the Manchego sheep breed.

Nevertheless, specifications may also lack requirements regarding natural resource protection, and uncontrolled economic development may lead to overexploitation of the natural resources involved in production. This is especially the case when the GI is so successful on the market that producers (existing and newcomers) intensify production (extending areas, specializing in monocultures and increasing yields), moving towards an intensive monoculture system to meet market demand without taking the reproduction of local resources into account.

The trade-off here concerns an increase in existing economic benefits versus preservation of the natural resources. Looking to the future, it is also a trade-off between short-term economic benefits and long-term ones, taking into account the fact that the availability and quality of local resources will determine economic viability in the future.

The recommendation to carry out regular assessments of the economic, social and environmental impacts of the GI process (FAO, 2009) is very important in this regard and would be particularly useful in the cases of Darjeeling tea (where farming practices are very intensive), Kona coffee (where there is a risk of the excessive use of pesticides) and Penja pepper (where there is the risk of excessive use of pesticides with the intensification of production and the increasing number of producers).

Chapter 7 – Conclusion and recommendations

Conclusion on GI economic impacts

This study confirms the existence of positive economic impacts in the nine GI processes analysed. It should be remembered that the cases were selected as operational GI processes, meeting the legal definition of a GI, i.e. specifications (or a code of practice) have been defined and the GI is used and managed by a collective organization. The evidence collected therefore confirms the hypothesis that when the basic conditions of registration of the GI are met, the economic impacts do occur.

The roadmap leading to impacts was analysed and illustrated graphically in order to help stakeholders plan a roadmap for their GI system. The key factors for success found in the literature also confirmed this. The first element contributing to impacts is the existence of specific characteristics linked to the geographical place of origin of the product. The transcription of these characteristics into the specifications and the quality management system both contribute to the consistency of the differentiation strategy over time. The second element is therefore related to the existence of effective collective decision-making by a strong producers' organization. This organization is the one that decides on the precise content of the specifications, while other collective decisions may boost the effectiveness of the differentiation strategy regarding such aspects as quality enhancement, market information, the lowering of certain collective costs such as research and access to public support. The main additional dimension that has a direct influence on the economic impact is the marketing strategy, at both the individual and collective levels of the GI value chain. An effective marketing strategy is a mix of branding, which may increase the renown of the product, positioning of the product on the market and access to new markets. Adjustment of the content of the specifications may be necessary to adapt to market changes. Lastly, public support is a major component that can boost or hamper the GI process, and thus have a strong influence on economic impacts. The aid provided by the public sector may be complemented by the private sector in effective public-private partnerships. The drawback of the involvement of the public sector is certainly the lack of empowerment of the value chain stakeholders, which weakens the long-term efficiency of the producers' organization.

Specific lessons learned from the studies have been highlighted so as to sensitize stakeholders regarding important issues when implementing a GI strategy: ensuring benefits to the upstream section of the value chain, striking the right balance between the public and private sectors, and taking the opportunity to disseminate innovations.

Limitations of the study

The aim of the study was to collect more evidence on GI economic impacts from a variety of cases and products in Europe and new GI countries where GIs are operational, in other words they have been implemented according to their definition, are based on specific quality, entail collective action and are sold on a market.

A first limitation is the number of cases: it would be important to extend the study to more cases in other countries and for other types of product. In addition, data are not always available in some countries, so that some cases rely mainly on qualitative data from stakeholder interviews and the number of interviews is sometimes low due to time and logistical constraints.

Another limitation is linked to the GI process itself: it is hard to assess the effects of GIs that are recent – as is often the case outside Europe.

The methodology established at the beginning of the study evolved considerably and had to be adjusted from one case to another. Further work is needed to develop a robust methodology that can be scaled up for widely varying GI processes.

Nevertheless, overall this study provides good evidence on economic impacts relating to price and market access in particular, together with exploratory results to be further analysed in terms of economic resilience. Impacts at the wider territorial level were outside the scope of the study, but the cases provided preliminary findings in this perspective.

GIs as tools for sustainable development

Official GI recognition and registration act as incentives, both for value chain stakeholders (producers and downstream players) to create and perceive values, and for public authorities to generate and enhance public goods (Vandecandelaere, 2016). Such a strategy is particularly relevant for remote or fragile areas (Colinet *et al.*, 2006), where intensification of agricultural techniques is not a valid option and where a GI process may represent the only means of generating price premiums to cover high production costs and therefore maintain production and economic activity (Parrot, 2002; Barjolle *et al.*, 2011).

In addition, GIs provide an appropriate basis for sustainability thanks to the link to origin and the capacity for "the reproduction of local resources" (FAO, 2010), i.e. preservation of the territorial, natural and cultural assets that underlie the origin-linked quality and reputation of the product. However, economic development, environmental preservation and social welfare may sometimes be seen as having trade-offs. The key is therefore to provide local stakeholders (producers, but also facilitators and local authorities) with the information and tools to make the necessary assessment and decisions, looking to the future of the GI system, including local resources. In this perspective, producers should think of sustainable development as a strategic orientation for preparing their own future by considering two important factors:

- the reproduction of local resources: in the long term, overexploitation of natural and human resources will damage the GI system itself and its viability;
- sustainability is increasingly being requested by consumers and is becoming a condition for market access, while negative impacts on environmental and social aspects could damage the image of a GI product and the GI category of products.

In this perspective, a series of recommendations can be made to maximize the contribution of GIs to sustainable development and sustainable food systems, representing a promising approach to achievement of the SDGs.

Recommendations for GI processes with a view to developing more sustainable food systems and sustainable value chains

Thanks to their link to origin, GI products can be the pivot for implementation of the origin-linked quality virtuous circle (FAO, 2010): the market tool can indeed also provide positive externalities to contribute to the preservation of local natural and human resources, and therefore to the three pillars of sustainability.

From the analysis of the key stakeholders and the lessons learned from the cases, recommendations can be drawn up for value chain stakeholders, public authorities and facilitators in order to optimize the positive economic impacts of the GI process on their areas, value chains and stakeholders. These recommendations also aim at supporting GIs as drivers of sustainable development and sustainable food systems.

Recommendations for value chain players engaged in the GI process: farmers, processors and retailers:

- take care over the content of the specifications or code of practice concerning specific quality in order to ensure equity and efficiency, i.e. both strong differentiation (premium) and bargaining power upstream (fair redistribution of added value);
- consider medium-term rather than short-term processes so that trust can be built up among players and a coopetition approach can be developed;
- consider the possibility of targeting niche markets and building supply control mechanisms to reduce price volatility and obtain more added value;
- from the start of the process, consider the possibility of developing agreements between

upstream and downstream segments of the value chain to implement fair distribution of value;

- pay careful attention to the specifications as a central tool (in terms of content and how they are agreed), so as to ensure not only equity and efficiency, but also the reproduction of local resources, by considering how requirements will influence the social and environmental dimensions of the GI system sustainability;
- consider regular assessment of impacts and adjustments.

Recommendations for public authorities:

- consider both protection and promotion policies in a sound policy framework;
- enhance the quality signal dimension of GIs thanks to the use of official logos;
- ensure that the legal framework and its enforcement are appropriate for small-scale producers, and ensure empowerment of producers, especially smallholders;
- facilitate changes in the specifications of registered GIs;
- consider new ways for certification to adapt to the diversity of local situations by building on the variety of possible verification systems: self certification, second-party certification and third-party certification, or even a participatory guarantee system;
- support the use of GI development as a tool to establish sustainable food systems and value chains by integrating the economic/social/environmental dimension into GI policies; for example, consider policies to remunerate positive externalities of the GI system for the environmental and social dimensions if no relevant market can be found to remunerate them sufficiently (prescriptively or as incentives, depending on the context.

Recommendations for facilitators and donors:

- raise awareness of the impacts of GIs and the key success factors in using GIs as drivers for sustainable local development, and facilitate technical assistance and investment in this field;
- facilitate the establishment of a governance structure ensuring horizontal and vertical organization as well as coopetition among stakeholders (see FAO training manual, 2017);
- facilitate the involvement of every stakeholder in the supply chain and the widening of the stakeholders from producers (processors + retailers) to consumers and others concerned with the GI process (local authorities, NGOs);
- facilitate information systems to provide transparency on specifications, prices and volumes;
- develop research to provide evidence on the link between the GI system and sustainable development, with the related key success factors;
- enhance the capacities of stakeholders in the GI supply chain to improve their process.

Annex 1 – Methodological approach for the study of economic impacts of geographical indications

As a preamble, this study was part of a collaboration with various universities (Angers School of Agricultural Studies, Montpellier SupAgro, Clermont Ferrand VetAgroSup, Swiss Federal Institute of Technology, in connection with master's degrees, which, on the one hand, allowed the study to benefit from the work of students to collect data, and, on the other, offered the students a formative experience. This influenced the way in which case studies were selected and the data collected.

Four stages were proposed for each case study: (1) description of the product and its value chain; (2) economic impact evaluation; (3) causal relations; and (4) discussion with the stakeholders. The research was carried out at three main levels: meso (the value chain of the GI product), micro (enterprises) and, when possible, resilience of the system. Only the meso level required standardized data collection and analysis in order to carry out cross analyses based on comparable data. The two other levels were adapted depending on the context, available data and resources. In general, samples of interviewees were not large, but sufficient in terms of the research questions addressed (Mason, 2010), inasmuch as each case required a general picture of the situation of the product and the value chain to start with. Then, quantitative (and representative) data for impacts were not always available. Some first insights into the effects of the GI process could be obtained through qualitative data on small samples. This made it possible to identify the various impacts more precisely, together with the sources of available data. In a second stage, systematic statistical data analysis and econometric assessment of economic impacts were carried out.

1.1 Description of the product and its value chain

This analytical presentation of the context is important, inasmuch as it provides the framework for the study.

Product description

The critical point is to identify the characteristics of the product that give it its special quality and are the basis for consumers' recognition of a level of specific quality. The FAO guide (Barjolle and Vandecandelaere, 2012)regional or national level, stakeholders and policy\u2010makers in agricultural and rural development often wonder about the existence of an agricultural and food heritage and the possibility of developing a strategy based on the optimization of typical products. These questions generally arise from the search for local development strategies that capitalize on local resources (by means of labels for products or tourism activities for carrying out inventories of origin-linked quality products sets out the link to the *terroir* and its components (Grid 1 concerning assessment of the link to *terroir* in ten points). This grid was used here: http://www.fao.org/in-action/quality-and-origin-program/tools/methodology-identification-inventories/en/.

Sources of information:

- face-to-face interviews with key people selected for their knowledge of the product;
- documents such as an existing code of practice or specifications applied for the product.

Value chain mapping

The objective here is to map the value chain and its stakeholders, operations and flows of materials and capital, and carry out a functional analysis.

This point concerns the productive structure of the value chain. The way GI value chains are organized varies widely, with some being fairly

integrated (with varying degrees of formality), while others operate more informally. The number of links in the value chain, their importance and the way they are coordinated will influence transaction and information costs, as well as the strategic choices made by the stakeholders, who, as Perrier-Cornet and Sylvander (2000) state, are interdependent and work together to monitor specific advantages, but retain their autonomy and property rights.

The task is to describe the dynamics of the system, then to determine the role of each link, the relations connecting the operators to one another and how these relations can increase the market value of the product for consumers.

Main points of analysis:

- the role of each link in differentiating the product and in building up the end product must be identified: what service is performed?
- what is produced by one link in the chain and how is it optimized (or not exploited) by other links?

Methods:

- value chain mapping;
- stakeholder mapping.

Sources of data:

- face-to-face interviews with experts and stakeholders in the value chain;
- secondary data (official and grey literature, internal dataset of the producers' group, statistics etc.).

Tools:

- map of stakeholders in the wider sense, that is, the economic players directly involved in upstream and downstream exchanges of the reference product (the GI studied) and also the institutional players or organizations that play a role in its development.

1.2 Economic impact evaluation

In order to collect data, analysis of economic impacts has been carried out at the three levels mentioned above (value chain, enterprises and resilience of the GI system). In order to explain differences in economic performance among GIs themselves, and between GIs and their substitute products, the influence of various factors has been taken into account.

Data collection methods:

- quantitative data are given priority during at least five years if possible, to allow a discussion of price transmission, market power transmission, market stability and the control of volatility, an essential point in stabilizing stakeholders' expectations;
- the typical farm approach was used to evaluate production costs;
- in the absence of data, however, qualitative information was collected.

Sources of data:

- statistics, if available; analysis of long-term series (over 20 years, for example); data for at least five years should be obtained;
- in addition, qualitative information should be collected from a representative number of stakeholders (or experts) in such a way that they can be converted onto scales (for example, the Likert scale https://en.wikipedia.org/wiki/Likert_scale);
- Apart from collecting data on prices at different points in the value chain, information should also be collected on the way prices are set at the various points.

Selection criteria for the substitute product: only three cases made a synchronic comparison using a substitute product (Darjeeling tea, Futog cabbage and Tête de Moine cheese), and in these cases, the student identified a similar product produced in an identical natural and economic environment:

- Darjeeling tea: non-GI mountain tea (from Nepal) or a GI plain tea from India (Assam);
- Futog cabbage: non-GI cabbage produced in the same village but of another variety;
- Tête de Moine cheese: another GI cheese produced in the same region (Gruyère PDO.

1.3 Causal relations

At this stage, the objective is to link the effects observed at the economic impacts level (economic status and resilience) with the causes, which can be identified in many aspects:

- the local setting of the GI (composed of both the natural and human factors of the area, which confer specificity to the product);
- the history of the GI (in the two dimensions of the history of the product itself and of the social construction of its quality, including its registration as a formal GI);
- other explanatory variables that have been preidentified for each case, such as juridical protection, quality and governance;
- any other cause, which may be very case-specific.

1.4 Discussion with stakeholders

The point here is to see what the advantages of these systems are from the stakeholders' point of view, and also their perception of the levers of economic and territorial development. The stakeholders to be included are those directly involved in the value chain, but also, more broadly, other players who may have a connection with the GI, including players from other economic sectors (such as tourism) or such political players as local communities or support institutions (bodies involved in research, agricultural advice or regional development).

A priority here is a discussion of the analysis of economic and territorial impacts, based on the views of experts and other stakeholders in the system. The discussion may be filled out with analysis of the specific contributions of each case, compared with the results found in various bibliographical references. This allows a validation of the conclusions and critical comments on the approach.

Annex 2 – Statistical method of GI impact evaluation

2.1 Methods

An evaluation has been carried out through in-depth quantitative analysis with a search for correlation explaining the economic impacts based on comparative time series (the diachronic method, before and after the GI process) or between the GI product and its non-GI substitute (the synchronic method), through econometric methods (mean comparison test, synthetic control and cointegration test), to provide thorough outputs on the economic impacts of the GI process. The methods used depend on the availability of data.

The bases for comparison are the GI product and one or more substitute products. The three levels of economic impact evaluation defined previously are the meso (value chain) and micro (enterprises) levels, and resilience.

Indicators have been set as follows:

- variables to be explained relate to economic performance (price, income, volume of production, exports) and resilience;
- explanatory variables relate to legal protection, governance and quality management.

A descriptive statistics approach is also adopted for each case.

2.2 Mean comparison test

A mean test was conducted to compare GI producers' performance before and after adoption of the GI, when we cannot implement synthetic control because of the lack of control groups.

Generally, two types of variable were used: economic variables, which include number of farmers, marketing, price and income; and physical variables, which include acreages and yields. For each variable, a mean test is performed in order to compare the mean value before the GI and the mean value after the GI. To put it differently, the null hypothesis of no difference before and after the GI is tested. A t-test was conducted. If the null hypothesis of no difference before and after the GI is rejected at the significance level of 5 percent, the results indicate that variables have significantly increased after adoption of the GI. This increase may be partially, but not wholly, explained by adoption of the GI.

2.3 Synthetic control

Previous studies evaluating the impact of GIs used either a diachronic approach – before and after GI registration – or a synchronic approach – comparison of two similar products, one with a GI and the other without (Hughes, 2009). However, one drawback of these approaches is the difficulty of separating the impact of GIs from other factors such as technological advances, quality control, advertising or policy dynamics (Bramley, 2011). The synthetic control method introduced by Abadie and Gardeazabal (2003), followed by Abadie *et al.* (2010; 2011), was proposed because it is primarily designed to overcome the limitations pointed out above. It provides a data-driven procedure to build a synthetic control unit based on a convex combination of comparison units that approximates the characteristics of the unit that is involved in the GI process. Overall, the synthetic control approach consists of five steps: (1) the first step selects the outcome variables; (2) the second step selects the relevant predictor variables so as to better match treatment unit (GI product region) to control regions (or countries); (3) the third step selects the period during which the difference between treatment unit and synthetic regions is minimized (two periods are distinguished: the first, known as the input period, represents the pretreatment period); (4) the fourth step identifies a pool of potential control countries from which the synthetic group is constructed (potential control regions or countries should not include regions or countries where the introduction of PGIs has taken place); and (5) the final step involves robustness checks (falsification test and mean squared prediction error test).

2.4 Cointegration test

Concerning resilience evaluation, there are two approaches underlying this concept in the present study:

- first, by considering the GI as a tool to decommodify agricultural products: it can be assumed that a GI can help to build a resilient production system by limiting the transmission of international price fluctuations to the domestic price; in econometric time series language, it can be said that the two markets are not cointegrated; the Engle and Granger two-steps approach (1987) was used to analyse the transmission of the international or domestic price to the local growers' price;
- second, by testing the ability of the GI market to absorb price shocks: this method uses the same approach as in price transmission; however, unlike price transmission analysis, a horizontal relationship is involved, analysing the price at the same market level (here, at world level).

Table A2.1: Synthesis of the data and methodologies used for the nine case studies

GI Product	Source of data	Type of analysis
Colombian coffee	• Survey data (van der Ven, 2015) - Fedecafé - 25 farmers - 3 cooperatives - 4 municipal committees - Cenicafé - 2 state bodies - 1 educator - 4 exporters - 6 traders/roasters - 5 supermarkets - 7 experts • ICO • CE DOOR	• Descriptive analysis • Synchronic analysis • Synthetic control • Cointegration test
Darjeeling tea	• Survey data (Shridhar, 2015): -21 tea gardens out of 87 -4 tea researchers -12 traders -20 small-scale tea planters -5 Tea Board of India officials • Tea statistics • Tea Board of India: accounting data and archives	• Descriptive statistics • Diachronic evaluation • Synchronic evaluation (Assam, Dooar and Nepal) • Mean difference test

GI Product	Source of data	Type of analysis
Futog cabbage	• Field data collection (Ochinnikova, March–May 2015): - in-depth interviews: 20 growers, 1 processor and 2 potential growers of Futog cabbage, 22 growers and 2 processors of Bravo cabbage, middlemen and experts - consumer survey: 15 closed-ended questions with 301 consumers interviewed via personal contacts, given questionnaires and in electronic form • Statistical Office of the Republic • Official site of the Futog Cabbage Association	• Descriptive analysis • Diachronic evaluation (since 2010) and synchronic evaluation (Bravo, the main hybrid) • Analysis of the consumer survey with Statistica 12.0 software, Pearson's chi-squared test of goodness of fit with cross-tabulation of results • Mean difference test
Kona coffee	• Survey data (Woodill, 2015): - discussion with industry leaders, field researchers and organizations - interviews with 20 stakeholders: 16 boutique farms, 3 processors, 1 cherry farmer • USDA and HDOA • Grading standards, labelling requirements, Kona certification and grading distribution, production values, export	• Descriptive statistics • Diachronic evaluation • Cointegration test
Manchego cheese	• Survey data (Ponce, 2015): - 75 producers provided information on the phone - face-to-face interviews with 14 stakeholders: Manchego Cheese Regulatory Council, Manchego Cheese Museum, 5 traditional cheese-makers, 3 industrial cheese-makers, 2 cheese experts and 2 ripeners These face-to-face recorded interviews followed a questionnaire of approximately 100 open questions about the value chain, the creation of economic payment, the surplus creation mechanism, the mechanisms explaining distribution and governance • Private reports from the CRDOQM • Annual reports from the Spanish Ministry of Agriculture, Food and the Environment 2001–2013 • Record of prices from the Provincial Technical Agricultural Institute • Reports of programmes implemented by the National Association of Manchego Sheep Breeders	• Diachronic evaluation (since 2000) • Synchronic evaluation (with Idiazabal and Zamorano cheese) • Descriptive statistics • Mean difference test
Penja pepper	• Survey data (Charbonnier, 2015): - interviews: 50 growers (40 GI, 10 non-GI), 20 GI distributors, nurseries, GRIGPP representatives, public and private partners (development agencies, research centres, government departments) and experts (agricultural researchers) - 2 farmers' focus groups - survey of 974 farmers - GRIGPP census dataset (120 GI growers) - major producers' price data (PHP and Plantations Metomo, 2009–2015) • IPC	• Diachronic analysis • Cost structure of the typical GI farm • Descriptive statistics • Mean difference test

GI Product	Source of data	Type of analysis
Taliouine saffron	• Field survey data (Mutarambirwa, 2015): - 91 farmers, 26 cooperatives, the 2 companies and the 3 consortia - in Taliouine: 6 local buyers in the souk and 3 local retailers were interviewed - in other towns: 1 cooperative, 20 supermarkets and 8 retailers in spice shops or souks were interviewed • Moroccan Export Bureau	• Analysis of production costs using the typical farm model • Descriptive statistics • Diachronic analysis • Mean comparison test
Tête de Moine cheese	• Survey data (Magna, 2015): - interviews: 2 ripeners, 9 processors, 14 cheese milk producers, 11 industrial milk producers, 14 cattle breeders and 7 horse breeders - the interprofessional association and several local agricultural experts were also interviewed • Federal Office of Agriculture • Swiss Centre for Agricultural Advisory and Extension Services • Swiss Milk Producers Union	• Modelling of a theoretical average farm • Synchronic evaluation • Diachronic evaluation • Descriptive statistics • Mean difference test
Vale dos Vinhedos wine	• Survey data (Michelotto-Pastro, 2015): - Interviews conducted in July and August 2015: - APROVALE (2 employees) - 13 wineries (out of APROVALE's 25 winery members) - 2 grape producers - 6 experts • 9 wineries under PDO: data from 1995 to 2015 regarding production costs, prices, volumes and income • APROVALE and IBRAVIN: data from 1995 to 2015 regarding number of wineries and volumes • Business France and Euromonitor: data from 2009 to 2015 regarding prices	• Diachronic evaluation • Descriptive statistics • Mean difference test

Source: Authors.

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PART II: Case Studies

Colombian coffee

boosting a strategy of differentiation by origin

The case in a few lines

- Arabica coffee, wet-processed, green or roasted, produced in Colombia's highlands at altitudes of between 400 and 2 500 metres, representing almost all the country's coffee production.
- Second largest Arabica coffee producer in the world: roughly 13 million 60-kilogram sacks, with almost 85 percent of production exported as green beans and 4 percent in roasted form, while 11 percent is consumed locally.
- A reputation protection strategy with national recognition of the geographical indication in 2004 and then recognition by the European Union (EU) in 2007 based on a long-established strategy of differentiation by origin, with commercial promotion of the *Juan Valdez* trademark registered in the 1950s, then the *Café de Colombia* trademark registered in the 1980s.

Economic impacts

- Increase in the prices paid to growers
- Short-term decrease in volume (effect of the control of supply by quality)
- Quality improvement and control
- The share of the price transmitted to producers increased
- Growers still affected by price fluctuations on the international market
- The GI allows more equitable middleman-grower negotiations

Key messages

- A consistent strategy to boost and protect a reputation linked to origin, which started to be developed in the 1950s.
- This strategy allows a rise in the price paid to growers, but does not protect against fluctuations in price on the international market.
- The effects can be boosted with the development of partnerships with roasters to differentiate the final product and thus move towards a niche market strategy; from this point of view, the strategy of developing good practice agreements with those who actually place the coffee on the market, permitting use of the GI, seems most appropriate.
- The GI process has meant that control over the value chain and the legitimacy of the National Federation of Coffee Growers of Colombia (Fedecafé) could be boosted.
- Fedecafé is strong and effective, and it receives considerable support from the state; in particular, it assures growers of a guaranteed minimum price.
- A future step: development of the GI in terms of regional protected designations of origin (PDOs) in Colombia, linked to an additional specific quality.

1. Link to the *terroir*

Colombian coffee (*Arabica* species, with Caturra, Tipica, Borbón, Maragogype, Tabi, Castillo, San Bernardo and Colombia varieties) was produced on 948 000 hectares in 2014 (see Figure 1) on three mountain ranges in the Andes at altitudes of between 400 and 2 500 metres. The soil and climate conditions are fairly specific: volcanic soils, annual temperatures between 18°C and 22°C and rainfall favourable to coffee growing throughout the year. The 86 microclimates resulting from these geoclimatic characteristics, combined with traditional know-how linked to hand harvesting and wet-processing techniques that have been used for generations, allow the production of green coffees that will yield a sweet drink after roasting, with medium to high acidity and a strong bouquet.

Figure 1: Colombia's coffee producing zone

Source: Authors.

2. History of the GI process

Since the 1950s, Fedecafé has built up the reputation of this coffee linked to its national origin. To start with, at the end of the 1950s, the creation of the Juan Valdez symbol marked the first differentiation strategy, evoking the image of the typical Colombian small farmer, as a response to the low market prices of coffee. This differentiation was backed up by the implementation of a quality control policy. Later on, at the start of the 1980s, the Café de Colombia certification brand was created and heavily promoted by Fedecafé.

This Fedecafé strategy was weakened with liberalization of the coffee market in 1989 following the abolition of the International Coffee Agreement, which had set up a quota system for coffee producing countries in order to regulate the world supply and thus prices. Prices between producing and consuming countries were – and still are – strongly affected by a very active international market in this relatively unprocessed and undifferentiated commodity.

Legal and institutional framework

Geographical indications for Colombia are registered with the Andean Community (which covers Bolivia, Ecuador and Peru as well as Colombia) in the framework of the Cartagena Agreement signed in 2010 (Decision 486 of 2000 of the Andean Community Commission), in which they are defined as designations of origin (DO) (a *sui generis* system).

The body owning the DOs and its unique label is the Superintendency for Industry and Trade. Management of the DO may be delegated to the public or private body representing the producers of the DO product. The producers can request registration of a DO as a natural or legal person.

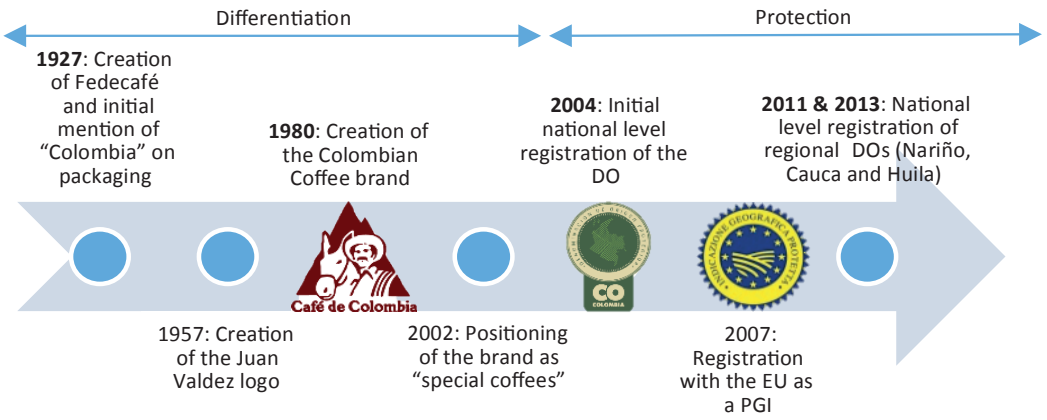
Controls guaranteeing quality and respect for the practices laid down in the specifications are obligatory.

Colombian coffee was the first product to obtain DO certification in Colombia.

Competition among producing countries intensified with the rise of such countries as Vietnam, which was producing almost no coffee at the start of the 1990s but was achieving similar amounts to Colombia by 2000. The volume produced by the 60 top coffee producing countries in 2001 was therefore greater than consumption and prices were steadily falling. In the face of this situation, Fedecafé launched a major campaign at the start of the 2000s to position Colombian coffee as a unique coffee with its authenticity linked to origin. It created its own roasted coffee brand, Juan Valdez Coffee, and opened specialist shops in many countries. It also targeted new countries, whereas until then it had focused on the United States and Canadian markets (since 1981 and 1990 respectively).

It started by developing and registering the first Designation of Origin (DO) at the national level – Colombian Coffee – in 2005, extending

Figure 2: History of the Colombian coffee value chain



Source: Authors.

Specifications

The specifications for Colombian coffee, whether national or European-level registration is concerned, include: demarcation of the geographical area; a description of the control and certification body and its role; a description of the product (coffee species and varieties, moisture content of green coffee, sensory qualities of the finished product, product age, preparation and presentation); production, selection, branding and packaging methods; growers record-keeping; procedure for obtaining GI authorization; and rights and obligations of GI beneficiaries.

The Colombian coffee specifications contain requirements solely for the production of green coffee. Only green coffee of the *Arabica* species produced in Colombia and harvested by hand, having been wet-processed and complying with the quality standards laid down by the Colombian Coffee Growers' National Committee, is eligible for the DO at the national level or the PGI at the European level. The final product must be a sweet drink with medium to high acidity and body, and with a full, pronounced bouquet.

No requirements are specified regarding roasting, which may take place outside the production zone. However, only roasters registered with Fedecafé and undertaking to observe good practices may use the Colombian Coffee GI. In the case of blends, Colombia may be mentioned in identifying origin so long as all the other origins are also mentioned.

this to Peru and Ecuador in 2006 and Bolivia in 2008, and obtaining registration of the protected geographical indication (PGI) in the pean Union in 2007, and then in Switzerland in 2013.

Formulation of the specifications to accompany the application for the European PGI was based on the overall policy for coffee drawn up by Fedecafé and the Colombian Government, together with the export quality standards in force since the 1930s. The specific elements of production were drawn up by the Coffee Research Centre (Cenicafé) by analysing data from about 13 000 coffee-producing properties. Fedecafé then developed a strategy of regional DOs on the basis of more specific zones of Colombia that enjoy a certain reputation among purchasers and have also been registered at the national level: Colombian coffees from Cauca (2011), Nariño (2011) and Huila (2013).

In 2010 the Superintendency for Industry and Trade delegated management of the Colombian Coffee DO – and also of the regional DOs Nariño Coffee, Cauca Coffee and Huila Coffee – to Fedecafé.

The strategy of differentiation by origin is thus not new and has gone through several major stages:

1. the trademark in the 1980s;
2. the national-level GI process starting in 2002 and registration of the DO in 2004;
3. registration of the PGI with the European Union in 2007, then with Switzerland in 2013;
4. development of regional DOs (registration of three such DOs between 2011 and 2013).

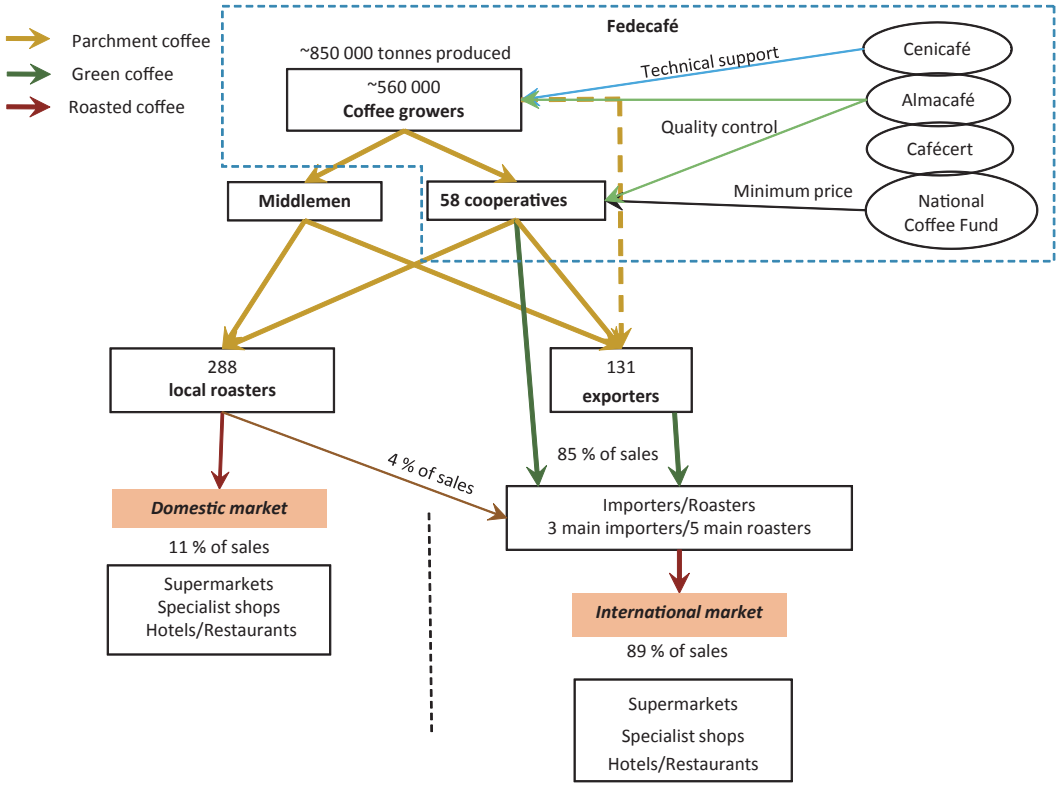
Production and market: some figures

World production of green coffee is about 150 million 60-kilogram sacks, with Arabica coffee accounting for approximately 85 million sacks.

With an annual production of approximately 13 million sacks of green Arabica coffee, Colombia is the world's second-largest Arabica coffee producer after Brazil, which produces about 38 million sacks. Almost 90 percent of Colombian coffee production is exported: in 2015, 5.2 million sacks of green coffee (40 percent of national production) were exported to its main consumer, the United States, which is followed by the European market (30 percent) (Fedecafé, 2015).

In terms of the local market, the Juan Valdez shops pursue a strong communication strategy. In 2015, the 230 such shops in Colombia and the 108 in 15 other countries generated a turnover of USD 68.5 million.

Figure 3: Diagram of the Colombian Coffee GI value chain



Source: 2015 data based on field surveys

3. Value chain

The GI value chain is managed by Fedecafé, which covers all the growers and their cooperatives, or over 550 000 growers, more than 90 percent of whom are small farmers with less than 5 hectares who together produce a little over half the total national production (see Figure 3). Apart from being the main exporter, accounting for 22 percent of exports, Fedecafé encompasses various institutions, thus enabling it to provide the value chain with a better structure:

- a network of 58 cooperatives with 605 purchase points;
- the National Coffee Fund, which is a parafiscal fund[9] entrusted with regulating the market;
- Almacafé, which is the logistics body and has inspection offices responsible for quality control and ensuring compliance with the GI

9 A parafiscal account managed by Fedecafé under a contract with the government, fed mainly by the coffee sector through taxes on exports, thus allowing the financing of public goods and services benefiting the whole sector (for example, purchase guarantees, scientific and technological research, technical assistance from extension services, and promotion).

Colombia coffee cherry

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specifications all the way along the value chain (production, processing, export and roasting);

- Cenicafé, the Coffee Research Centre, which has adapted near infra-red spectroscopy (NIRS) technology to guarantee the origin of coffee for export in order to avoid fraud;
- Cafecert, the certification body responsible for evaluating authorization to use the GI by new members and monitoring the use made of it.

The middlemen and cooperatives gather the production together in the form of parchment (depulped) coffee. A few growers sell large quantities directly to exporters.

Most of the coffee produced (85 percent) is exported in the form of green coffee. The remaining 15 percent is processed by local roasters and about 4 percent of this 15 percent is exported. Since Colombian coffee is marketed mainly on the international market, it is dependent on the downstream links in the value chain, concentrated in the hands of a few players. This makes it an oligopolistic structure, inasmuch as three major importers control 50 percent of the world's green coffee sold on the international market, while 45 percent of the world's roasting markets are in the hands of five roasters.

4. Governance of the GI

Management of the GI by market stakeholders

Fedecafé was created in 1927 to monitor the market and defend coffee growers' interests. It is the body responsible for managing and promoting the coffee value chain, monitoring all exports, fixing the daily minimum prices paid to growers (on the basis of prices on the New York stock exchange), carrying out quality management, supporting research and providing extension services for growers. It is thus responsible for the promotion and protection of Colombian coffee. It is funded by (1) taxes paid by growers (USD 0.06 per pound of coffee exported[10]) through the National Coffee Fund; (2) sales of coffee through Fedecafé; and (3) sales in Juan Valdez shops.

Fedecafé drew up the specifications on the basis of analysis of farms and in consultation with the growers.

External and institutional support

The Colombian State supports the coffee sector, particularly through the National Coffee Fund. It has passed laws to establish GIs in Colombia and recognized Fedecafé as the PGI management body in 2010. These measures have enabled Fedecafé to boost its political legitimacy as a result of promotion efforts and regulation of the international market.

10 Or USD 0.13 per kilogram.

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method/Source
Price paid to growers	Price for coffee under PGI higher than the price of hypothetical coffee without PGI	The difference between coffee under PGI and hypothetical coffee without PGI is on average USD 0.38 per pound in favour of PGI coffee (see Figure 4)	*Synthetic control*: • before and after registration of the PGI in 2007 • PGI Colombian coffee and non-PGI countries belonging to ICO[11]
Resilience	Transmission of the international price	• The share of the price transmitted to producers increased after the registration of the PGI: before producers received 68% of each dollar paid by roasters to Fedecafe on the international market; and after this share increased to 85%. • Asymmetrical transmission of prices to growers: greater in the case of a fall in the international price than in the case of a rise • Prices of international coffees are cointegrated - therefore not independent - with the prices paid to growers in Colombia before and after PGI registration, indicating that the PGI has not allowed Colombian coffee to be de-commodified	Cointegration analysis with structural break
	Absorption of price shocks	No difference in the degree of shock absorption before and after PGI registration	Cointegration analysis
Volume	Short-term reduction in coffee production between 2008 and 2012	Reduction of 33 percent, or about 4 million sacks, in coffee production between 2008 and 2012 in comparison with previous years when production reached 12 million sacks (see Figure 5)	Descriptive statistics Master's dissertation

Source: Authors.

Monitoring and guarantee systems

GI certification is guaranteed by a traceability system covering the whole value chain. To start with, Fedecafé has a database of all the plantations and their characteristics (the Colombian Coffee Growers' Information System, SICA). Almacafé is in charge of carrying out quality controls based on the Colombian coffee specifications at all stages up to export. Monitoring of the coffee during its processing is ensured through controls on purchases on authorized sites and is linked to an official waybill (*guía de transito*) that accompanies the product to the export port and is checked by customs officials and also by Cafecert. The roasters authorized to use the GI observe the good practices agreement made with Fedecafé. The roasted coffee is also subject to various quality controls by specific enterprises. Bodies hoping to use the word "Colombian" and the logo must send Fedecafé the Cafecert compliance certificate and the record of all the sites through which the coffee has passed (processing and roasting plants).

5. Economic impacts of the GI process

In the case of the Colombian coffee GI, the following economic impacts can be highlighted (Table 1).

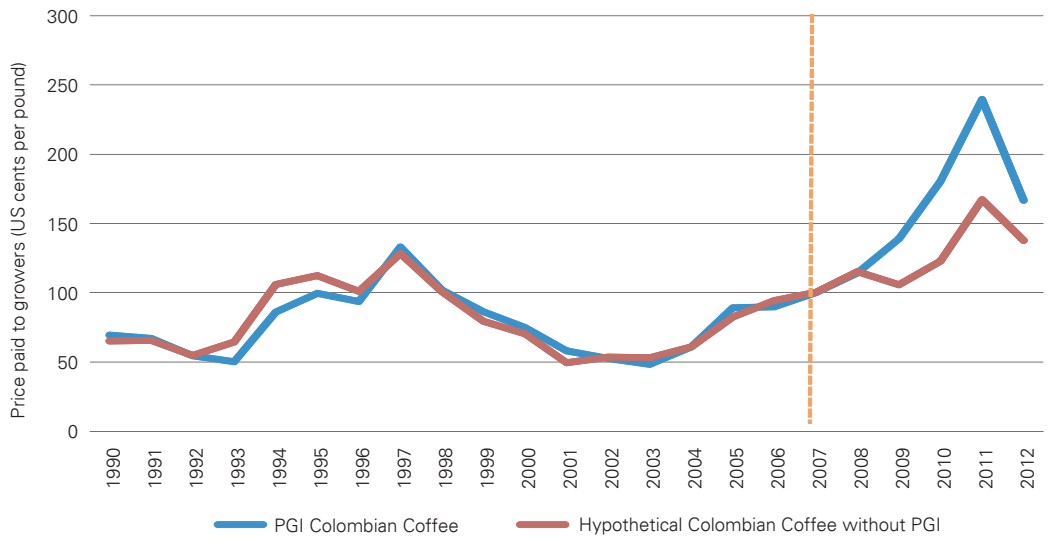
The quantitative analysis performed using the synthetic control approach shows that adoption of the GI has allowed an increase in the coffee price paid to growers. Thus, Figure 4 shows that in the absence of the GI, the prices paid to Colombian coffee growers would have fallen. For example, the price paid to Colombian coffee growers as observed in 2010 was USD 1.81 per pound,[12] whereas it would have been USD 1.23 in the absence of the GI. Over the period 2008–2012, an average difference in price of USD 0.38 per pound is observed in favour of Colombian coffee.

The positive impact of adoption of the GI on the price paid to Colombian coffee growers is a result of the implementation of a plantation renewal policy. Adoption of the GI entails compliance

11 International Coffee Organization.

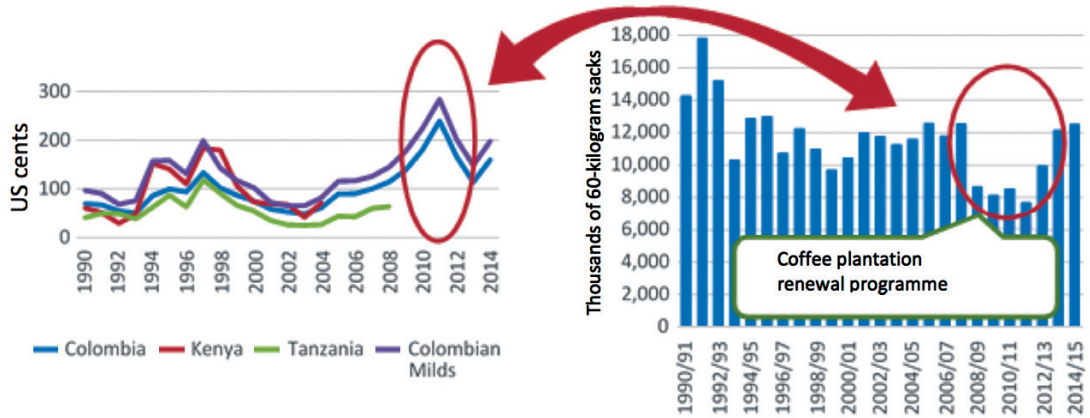
12 Or USD 3.99 per kilogram.

Figure 4: Evolution in the price paid to growers for GI Colombian coffee between 1990 and 2012



Source: Authors.

Figure 5: Relationship between price and production of Colombian coffee



Source: data obtained from ICO

Impacts on the territory

The Colombian coffee GI was the first GI registered in Colombia and has been followed by many others, so that there are now 12 agrifood products and 11 non-food artisanal products registered at the national level. Five are coffees from specific regions of Colombia. The stakeholders interviewed believe that the Colombian coffee GI provided a model and has encouraged the development of such strategies of optimization on the basis of origin.

Moreover, local governments see Colombian coffee as a source of employment and national economic development. Creation of the "coffee axis", in which coffee production is a shared development resource, covers five departments: Valle del Cauca, Quindío, Risaralda, Caldas and Tolima. Coffee production is seen as a lever for the development of rural areas of Colombia and protection of this system by the GI makes it possible to protect territorial development efforts and the results achieved to date.

Lastly, the development of tourism has also been stressed. The registration of GIs helps to preserve and protect growers' local landscapes, traditions and know-how. The Coffee Park created in 1995 by Fedecafé, which offers a number of attractions, entertainments and discoveries linked to Colombian coffee in the Quindío region, illustrates the link between a product of origin and tourism, and also the ability of this link to generate jobs and income: five million coffee lovers from all over the world came to visit in 2009.

The inclusion of the cultural and Colombian coffee-producing landscape among UNESCO world heritage sites undoubtedly also plays a role in this rise of tourism.

Typical landscape of the Colombian coffee territory

© Van Der Ven Paulo

with specifications that lay down stricter quality requirements. Improvement in quality through a programme to renew plantations with varieties more resistant to climatic fluctuations entails a shrinking in supply, which in turn, in the context of a stable demand, leads to a rise in price (see Figure 5).

Following registration of the PGI, control of the coffee value chain was concentrated in the hands of Fedecafé, thus boosting its national and international standing and its legitimacy in managing the national value chain.

This strategy of having Fedecafé control the supply has certainly provided a boost to the application for European Union recognition of the GI, a longer-term strategy that will give access to new markets.

Adoption of the GI has also led to an increase in the portion of the international price received by Colombian coffee growers: analysis shows that prior to establishment of the GI, for each dollar received by the National Coffee Fund for the sale of Colombian coffee, USD 0.68 was paid to the grower, whereas after adoption of the GI, this portion had risen to USD 0.85. This result shows the capacity of the GI tool to enable growers to benefit from a rise in international prices, through two channels:

- on the one hand, Fedecafé proposed a "purchase guarantee" to growers, stipulating a minimum price that varies depending on the price on the international market on which middlemen base themselves;
- on the other hand, the collective action strategy allowed by establishment of the GI has enabled growers to join together and made it easier for them to negotiate higher prices with the exporter; the GI makes it possible to establish a more equitable negotiating relationship between middlemen and growers.

Even so, these results are not clear-cut, inasmuch as the power balance between middlemen and growers is not even. Quantitative analysis shows that falls in price are more easily handed on to growers than rises in international prices (asymmetrical transmission), indicating a strong concentration and a high rate of intermediation downstream in the value chain. Moreover, the improvement in the prices paid to growers does not make up for all the difficulties facing Colombian coffee growers. Although it may seem an economic success, the differentiation strategy now being implemented is not sufficient to attract the younger generation. Costs rose by 28 percent between 2009 and 2014, mainly because of the high price of fertilizer and labour,

with workers increasingly hard to find in rural areas. In 2014, growers retained approximately 10 percent of the final value of the coffee, while roughly 50 percent remained in the consumer countries (van der Ven, 2015).

Lastly, the whole process of differentiation by origin and its protection have not led to an improvement in the capacity to absorb shocks in international prices. The results show that there is no difference in shock absorption before and after adoption of the GI. Moreover, despite adoption of the GI, Colombian coffee is still a commodity: the Colombian coffee market is still dependent on the international market (Colombia Milds).

6. Conclusion and future outlook

Colombian coffee is distinguished from other coffees at the international level by, on the one hand, its close link to a particular *terroir* and, on the other, governance of the value chain. For example, the guarantee of a minimum price to coffee growers or the formulation of strict quality requirements and their monitoring mean respectively a more equitable sharing of wealth and a higher quality product.

Fedecafé has thus played a crucial role in developing the value chain, in the first place by promoting Colombian coffee through the creation of the *Juan Valdez* and later the *Café de Colombia* trademarks, and then through protection of the name and reputation thanks to the registration of a DO at the national level and a PGI at the European level. These steps made it possible to protect Fedecafé's differentiation strategy, thus boosting its legitimacy. Even so, coffee is still marketed as a commodity and is affected by fluctuations in the international market. For example, inasmuch as it is not obligatory to mark the final product with the PGI as a sign of quality and origin, systematically affixing this label to it when it is marketed in Europe, Colombian coffee sometimes simply becomes an ordinary coffee without any particular differentiation.

One of the main challenges for maintaining the value chain is to boost the attraction of rural areas so as to keep a sufficient workforce in place, because the latter is tending to shrink. A second task is to continue research so that traditional production systems can be better adapted to climate change. The third task is to boost the involvement of all the stakeholders in the value chain, from growers to importers and roasters, in the GI process with shared objectives to develop the differentiation strategy and work to achieve a value chain that is less dependent on the international market.

Methodology

Sources

- Survey data (van der Ven, 2015)
  - Fedecafé
  - 25 farmers
  - 3 cooperatives
  - 4 municipal committees
  - Cenicafé
  - 2 state bodies
  - 1 educator
  - 4 exporters
  - 6 traders/roasters
  - 5 supermarkets
  - 7 experts
- ICO
- CE DOOR

Types of analysis

- descriptive analysis
- synchronic analysis
- synthetic control
- cointegration test

Acronyms

Cenicafé	Coffee Research Centre
DO	designations of origin
EU	European Union
Fedecafé	National Federation Coffee Growers of Colombia
GI	geographical indication
ICO	International Coffee Organization
NIRS	near infra-red spectroscopy
PDO	protected designation of origin
PGI	protected geographical indication
SICA	Colombian Coffee Growers' Information System

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Darjeeling tea, India

protecting a product's name for export markets

The case in a few lines

- Tea from the Himalayas (traditionally black tea, but also green, white and Oolong tea), considered the "champagne of teas" on the international market.
- Produced at altitudes of between 600 and 2 250 metres on an area of roughly 18 000 hectares in 87 large tea gardens that are the only ones with the right to "GI status".
- About 10 000 tonnes of tea produced each year, more than 70 percent of it exported.
- GI managed by a government body, the Tea Board of India.
- Long-standing protection of the GI, initially with protection of the logo in 1957, then various strategies to protect the name and the logo depending on the importing country (trademarks, certification marks and protected geographical indications) through to the obtaining of a PGI in the European Union in 2011.

Economic impacts

- Existence of a price premium as against substitute teas
- Diversification of export markets
- Increase in the number of permanent jobs

Key messages

- Darjeeling tea has a long-established reputation linked to its *terroir*, and national public and private stakeholders very soon realized how important it was to protect its name on the international market through various intellectual property protection tools.
- The major involvement of the state means that planters play a very minor role in managing the GI.
- The establishment of a sophisticated traceability system to provide a certificate of origin makes it impossible to counter any misappropriation of the name.
- Its economic success could be more effectively accompanied by more sustainable environmental and social measures.
- The Darjeeling tea GI process is an intellectual property protection strategy in which the local territorial strategy plays little part.

1. Link to the *terroir*

Darjeeling tea is grown on the lower Himalayan mountain chain in India (see Figure 1) on an area of 17 820 hectares at a high altitude (between 600 and 2 250 metres) and on fairly steep slopes (between 60° and 70°), where the tea gardens create a unique and spectacular landscape. The specialized traditional knowledge of Darjeeling tea picking and its delicate processing also contribute to its special character and its unique "musky" bouquet.

Figure 1: Darjeeling tea production zone

Source: Authors.

The variety of tea grown is var. sinensis, which is distinguished from other varieties by its particularly small leaves
Darjeeling tea is picked mainly by women (60 to 70 percent of the workforce) and the task represents a very special ancient skill. It is delicate work carried out by hand and consists of picking solely the two smallest leaves of the bud, which explains the very low yield as compared with other teas: between 400 and 450 kilograms per hectare as against a national average of about 1 800 kilograms.

After picking, the leaves undergo a wilting process in which they lose moisture and shrivel. Other processes follow: rolling, fermentation, drying, blending and packaging.

Depending on how the leaves are processed, Darjeeling tea may be black, green, white or Oolong. The leaves are picked three times a year, each harvest giving different sensory characteristics: the first harvest gives a tea with a more floral bouquet, whereas the bouquet from the second picking is tinged with nutmeg.
Tea has been grown in this region since about 1835 and expanded rapidly after a nursery was established in 1847 and also thanks to the very favourable climatic conditions of the region. Trade with the British Empire meant that Darjeeling tea quickly acquired a global reputation, being considered the champagne of teas thanks to its unique sensory qualities.

Legal and institutional framework

In India, a first law on trademarks was approved in 1958. Following this law, the Tea Board of India registered the name "Darjeeling" in 1986, together with its logo, which had been used since 1958 as a certification mark.

Geographical indications (GIs) in the sense have existed since 15 September 2003, when the 1999 Geographical Indications of Goods Act came into force. There is only one way to protection. Application for a GI must be made by a producers' association or some other type of group representing producers.

In 2004, Darjeeling tea was the first product registered in India as having a GI.

2. History of the GI process

The tea industry has been controlled by the central government since the Tea Act was passed in 1933. However, this law was temporary, and in 1938 a permanent law was passed with the aim of controlling Indian tea exports and expanding the areas under tea.
In 1949, the Tea Board Bill was passed, with the aim of developing the sector. With a view to combining these two laws (the 1938 Indian Tea Act and the Tea Board Bill), the new Tea Act was promulgated in 1953, setting up the Tea Board of India, again under the control of the government, in the form of the Ministry of Trade and Industry. All the value chains for the various teas grown in India (from cultivation through to marketing), including Darjeeling, are managed by the Tea Board of India, which is the body responsible for applying the regulations and policies laid down by the government. It has the task of regulating Indian tea production by improving its quality, encouraging research to regulate tea sales and exports, supplying training for sensory analysis,

Specifications

The Darjeeling tea PGI specifications (for the European Union) contain: a description of the product (with a brief historical introduction to the tea, its sensory and chemical characteristics and the features of its *terroir*); demarcation of the geographical zone; proof of origin through a historical reference and explanation of the traceability system (description of controls carried out of planters, warehouses, distributors and exporters); a description of the production method; the link to the terroir (geographical, agro-climatic, topographic, harvesting method); an indication of the certification body; and a presentation of the logo and the various protections of the name and logo.
With regard to the production method, the specifications lay down that all processing of Darjeeling tea must be carried out within each tea garden where the state's processing plants are found, in order to keep the time between the picking and processing of the leaves to a minimum to guarantee the ideal quality.
The wilting stage must last for between 14 and 16 hours to trigger the first physical and chemical changes: the leaves become soft so that they can withstand twisting and can be rolled without breaking. Fermentation, the next stage, must last for between two and four hours. The specific sensory qualities of Darjeeling tea develop thanks to this process. After this, the leaves are dried in order to stop the fermentation process thanks to enzymatic deactivation. Lastly, the leaves are graded on the basis of their size. Bulk packaging must be carried out in the production zone, but retail packaging for the end consumer may take place outside the zone.

establishing quality standards and improving tea promotion in India and other countries.
In 1957, the Tea Board of India designed and registered a specific logo for Darjeeling tea (see Figure 2), thus marking the first differentiation of Darjeeling tea on the international market.

Figure 2: Darjeeling tea logo

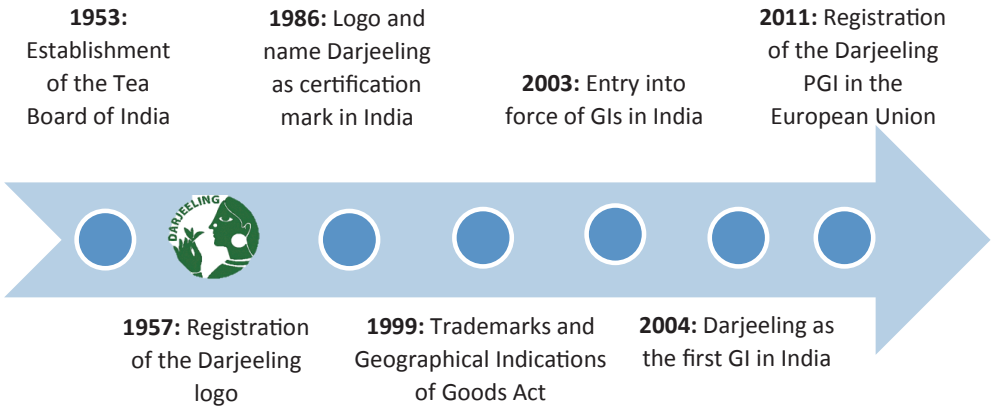
It had such an excellent reputation that its name was misappropriated in various countries. Some planters estimate that between 40 000 and 50 000 tonnes were being traded annually before 1987, whereas at this time production in the Darjeeling zone was only 10 000 tonnes. Through the various steps taken to ensure protection, it became possible to curb misappropriation of the name. In defence of the name of Darjeeling tea, the Tea Board pursued 15 legal cases in the fight to counter usurpation of the Darjeeling name in 2015. The Tea Board also registered the name and logo in the framework of the new Trademarks and Geographical Indications of Goods Act in 1999. With a view to providing legal protection, the board registered the name "Darjeeling" together with the logo in various ways in each country. In the United States, the United Kingdom and Australia, for example, the Darjeeling name and logo are protected by a certification mark, while in Russia they are registered as a trademark. In the European Union, the Tea Board obtained registration of the protected geographical indication (PGI) in October 2011. In various other countries, the logo has been registered on its own under various types of mark.[13]

3. Value chain

The GI value chain is organized around 87 large tea gardens with areas of between 23 and 550 hectares each. They belong to the government of West Bengal State and each garden manager has a renewable lease from the government for a minimum of 30 years. Seventy-two of these gardens have a processing unit where the tea goes through all the processing stages up to packaging. Those running the 15 other gardens go to one of their neighbours' processing units. The gardens employ about 70 000 permanent staff against board and lodging and a low wage. A further 15 000 seasonal workers are taken on to cover picking (between March and November).
Once the tea has been processed, it can be sold either by auction or by direct sale to a private player. After this, the tea is mainly exported, but some is sold on the domestic market. Direct export from the garden to the international purchaser is also possible.

13 http://ec.europa.eu/agriculture/quality/door/registeredName.html?denominationId=1900

Figure 3: History of the Darjeeling tea value chain



Source: Authors.

Production and markets: some figures

China and India are the world's two main tea producing countries, accounting for close on 60 percent of world production. China produced more than 1.9 million tonnes in 2013, while India produced more than 1.2 million tonnes. The tea produced in the State of Assam represents almost half of India's total production, or more than 550 000 tonnes, while Darjeeling tea production is of the order of 9 000 tonnes, or less than 1 percent of the country's total production. In the neighbouring region, Dooar tea, which has sensory qualities similar to those of Darjeeling tea, has a production of about 180 000 tonnes.
Kenya, China and Sri Lanka are the world's largest tea exporting countries and India is fourth, exporting a little more than 20 percent of its production. It should be noted that the majority of Darjeeling tea, or 70 to 80 percent of production, is exported, mainly to Europe and Japan.

It should be noted that there are also 15 000 independent small-scale tea planters (with less than 1 hectare each) in the Darjeeling region, located in marginal zones and with no infrastructure to carry out processing. They very often sell their production to middlemen, who resell the leaves to factories specializing in this production; this tea is intended mainly for the local market and is not considered to be Darjeeling tea.

4. Governance of the GI

Management of the GI by stakeholders

The Darjeeling Tea Association (DTA), previously the Darjeeling Planters Association, is made up of all the stakeholders in the Darjeeling tea value chain: gardens (planters and processors), middlemen and exporters. The association is responsible for collecting the picked, processed and forwarded tea, and informs the Tea Board of this, which then issues the certificate of origin. The DTA has also supported the establishment of a traceability system by a specialized body (see below).

Along with its close collaboration with the Tea Board of India for the promotion of Darjeeling tea, the DTA keeps its members abreast of anything that could help to develop the sector (legal issues, technical training, market situation). It also works with the West Bengal Labour Department and the Workers' Union to fix a minimum wage and bonus levels.

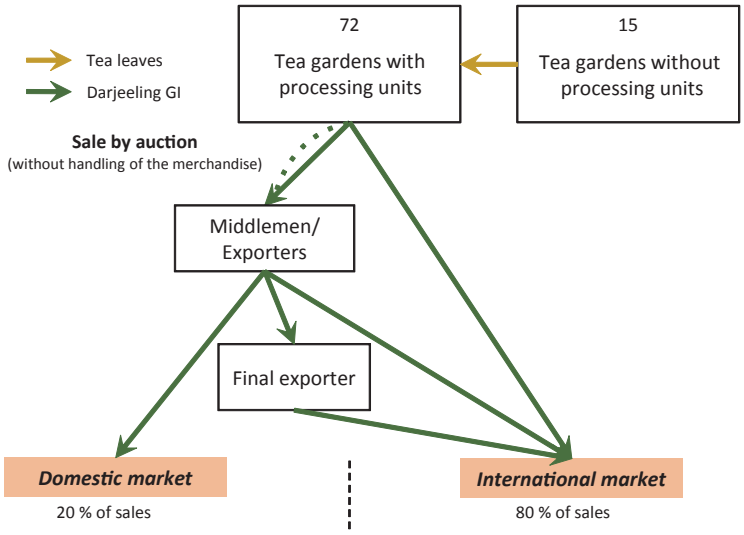
External and institutional support

The Tea Board is responsible for applying for the GI and any other action taken to date to protect the Darjeeling name and logo. It plays an active role in supporting the Darjeeling tea value chain and provides technical and especially financial assistance to the DTA. It also establishes protection and monitoring measures for the name in other countries. In addition, the board subsidizes the gardens: plantations, infrastructure, capital development, conversion to "green" production, certification costs, training etc. The National Bank for Agriculture and Rural Development and various international

Darjeeling tea harvesters

© Srhidar Aparna

Figure 4: Diagram of the Darjeeling tea value chain



Source: 2015 data based on field surveys

development agencies also contribute to this development.

Monitoring and guarantee systems

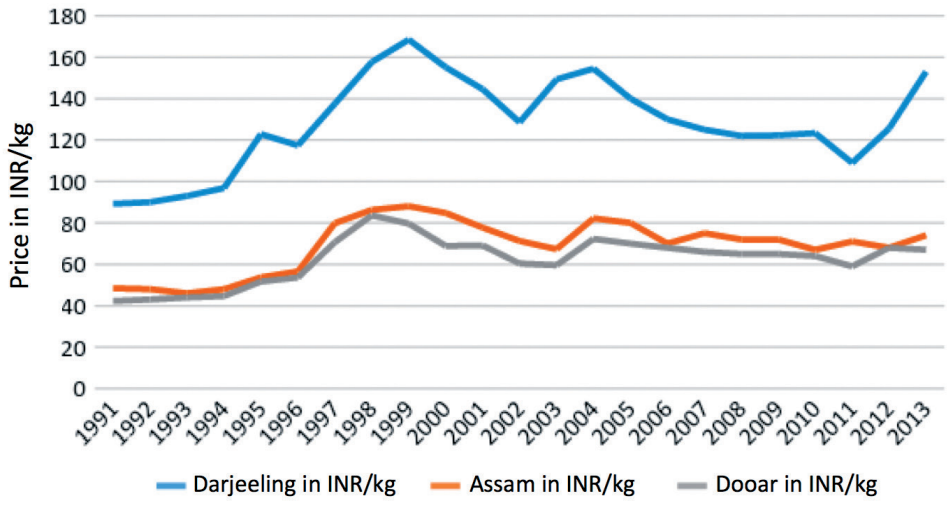
The traceability of Darjeeling tea is guaranteed through the monitoring of all the stages in production (gardens, storage facilities and distributors, including exporters) and is based on an on-line system, the Darjeeling Tea Trade Supply Integrity System, which provides the basis for issuing a certificate of origin. The gardens are all registered with the Tea Board of India, which carries out regular controls. All invoices are recorded and filed by the board. They contain lot and batch numbers, together with details as to the quantity, quality and chest number. The tea is then sent to storage facilities, which are also registered with the board. All the tea sold is registered with the Sales Centre, as are all the purchasers (exporters, brokers or auction centres). Exporters are registered by the Tea Board of India

Table 1: Economic impacts

Variable	Impact	Scale of the impact[14]	Method
Price	Premium in comparison with substitutes	Between 1991 and 2013, an average premium of INR 60.4/kg and INR 66.9/kg in comparison respectively with Assam and Dooar teas Price almost double that of Assam and Dooar teas in recent years	Descriptive statistics
	Price increase	Significant increase of prices after 2011, the European Union PGI registration date: from 110 INR/kg in 2011 to 153 INR/kg in 2013	Descriptive statistics
		4% increase in prices between the period before PGI registration in India (2004) and the period after PGI registration in India: from 125 INR/kg to 130 INR/kg	Mean comparison test
Production	Relatively stable	Average production of 10 500 tonnes in both the pre-and post-PGI periods	Mean comparison test
Markets	Exports: stability and diversification	Approximately 70% of production (about 7 000 tonnes) exported in both the periods before and after PGI registration in India (2004)	Mean comparison test
		Diversification in export countries: from 35 countries in 2004 to 45 in 2013	Descriptive statistics
	Types of market	About 55% sold at auction and 45% through direct sales	Descriptive statistics
Jobs	Increase of about 25% in the number of jobs between the pre-and post-PGI periods		Mean comparison test

Source: Authors.

Figure 5: Evolution of prices of Darjeeling, Assam and Dooar teas between 1991 and 2013



Source: Tea Board of India, 2015

and for each lot exported they must supply the certificate of origin, the tea exporter's permit and the certification mark user's permit. The planter's permit number is indicated on each package .

Lastly, an independent certification body, IMO Control Private Ltd., is responsible for carrying out audits of the commercial chain: 29 gardens are audited each year, 9 others are audited randomly, and 100 downstream stakeholders are checked.

5. Economic impacts of the GI process

In the case of Darjeeling tea in India, the following economic impacts can be highlighted (Table 1).

14 1 Indian rupee (INR) = EUR 0.01376 EUR – December 2016.

Impacts on the territory

Intensive tea production in Darjeeling has caused major environmental problems. Deforestation and the intensive use of chemical products are the source of the soil erosion and degradation problem. Apart from causing environmental problems, this type of production is a threat to long-term development of the value chain, since soil quality is one of the major factors in the specific quality of the tea. Fair trade and green agriculture certifications are those most widely requested by purchasers and consumers, reflecting an increased awareness in this regard among consumers.
Lastly, the development of tourism in the Darjeeling district should be highlighted, for it represents a major economic activity in the region, which has become one of India's main tourist destinations. According to the Ministry of Tourism, about 350 000 Indian tourists, compared with 20 000 to 30 000 foreign tourists, visit the region each year, generating about INR 6 500 000, or a little over EUR 85 000, in earnings. A wide range of activities is offered in Darjeeling: tea shops, tea rooms, a train that travels up to an altitude of more than 7 000 metres, cable cars, places to see and purchase local dress, bungalows and rural tourism where tourists discover the very simple way of life of planters.

Typical Darjeeling tea production landscape

© Srhidar Aparna

The price of Darjeeling tea is consistently and significantly higher than that of its substitutes (almost double that of Assam and Dooar teas in recent years: see Figure 5). Between 1991 and 2013, Darjeeling tea had an average premium of approximately INR 60 per kilogram and INR 67 per kilogram as against Assam and Dooar teas respectively. Its specific quality and high production cost are the main reasons for this difference. Moreover, there was a significant increase in prices after 2011, the year the PGI was registered by the European Union (see Figure 5). The relative stability of production and the constant demand may be the source of this rise.

Registration of the GI does not appear to have had an impact on production, which remained relatively stable in the pre-PGI period and the period after the PGI was put in place, averaging about 10 500 tonnes. Exports follow a similar trend, accounting for an average of about 70 percent of production. A diversification can be noted in the destination of exports, with the number of countries rising from 35 in 2004 to 45 in 2013.

Another impact to be noted is the 25 percent increase in the number of permanent jobs in the region between the pre-PGI period and the period after the PGI was put in place. The stricter specifications concerning production conditions and the quality of the tea may be behind this increase. Moreover, better application of the 1951 Labour Law is reflected in an increase in permanent jobs at the expense of temporary jobs. Nevertheless, it seems that this can

be linked more to the emergence of other certifications, particularly fair trade certification.

6. Conclusion: lessons and future outlook

The Tea Board has played a vital role in the development of the geographical indication. Its strategy is based on the development of international markets, while local dynamics are taken into little account. The specifications highlight special traditional skills in the delicate picking and processing of Darjeeling tea, which make a major contribution to its original character and unique bouquet. The monitoring and guarantee system established is very effective.

Darjeeling tea benefits from a major premium as against other Indian teas, and registration of the PGI by the European Union has led to a considerable increase in permanent jobs in the sector.

The implementation of various strategies to protect the name is fundamental in safeguarding the reputation of the value chain. Social and environmental certifications are a major trend today, and it may be of benefit to develop complementarity between these types of certification and that of the GI in order to support the sustainability of the value chain, especially in social and environmental terms.

Methodology

Sources

- Survey data (Shridhar, 2015):
  - 21 tea gardens out of 87
  - 4 tea researchers
  - 12 traders
  - 20 small-scale tea planters
  - 5 Tea Board of India officials
- Tea statistics
- Tea Board of India: accounting data and archives

Types of analysis

- descriptive statistics
- diachronic evaluation
- synchronic evaluation (Assam, Dooar and Nepal)
- mean comparison test

Acronyms

DTA	Darjeeling Tea Association
GI	geographical indication
PGI	protected geographical indication
TRIPS	(Agreement on) Trade-Related Aspects of Intellectual Property Rights

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Futog cabbage, Serbia

preserving a local variety

The case in a few lines

- A white cabbage, either fresh or fermented, Futog cabbage has particularly fine, elastic and flexible leaves, a characteristic appreciated by Serbian consumers for whom white cabbage is a central element of their diet.
- It comes from a local variety that is less productive than – and increasingly replaced by – less fragile hybrid varieties; its seeds are preserved thanks to the know-how of 36 enthusiastic farmers.
- Grown in the Danube plain in northern Serbia, its production represents less than 0.5 percent of total production (468 tonnes of Futog cabbage produced in 2014).
- The domestic market is the main outlet (92 percent of sales).
- The appellation of origin (AO) was registered in 2009 in the framework of the new Serbian law with the aim of protecting the misappropriated name and preserving the local variety.

Economic impacts

- Increase in prices paid to farmers after registration and certification, and in comparison with the substitute product
- In the case of processed (fermented) cabbage, the lone processor basically retains the added value

Key messages

- The GI process makes it possible to preserve a local variety; the guarantee system established by the association of growers and supporters is an essential tool for in situ conservation.
- It also provides protection of the name and reputation of Futog cabbage.
- The AO is still new (first certification in 2012) and has great potential (premium effect and preservation of the local variety), but it must prove its viability, particularly through more autonomy regarding the financing of certification costs.
- The value chain needs to free itself of the processing monopoly so that the added value linked to the processed product can be better distributed.

1. Link to the *terroir*

Futog cabbage (*Futoški kupus* in Serbian) is grown in the region around the town of Futog (see Figure 1) in the very fertile Danube plain, the Vojvodina, in northern Serbia. The earliest mentions of this crop in the region date from 1578. The zone is composed of the alluvial terraces of the Danube where the altitude is about 80 metres, there are major amounts of subterranean water and the soil is black and rich in humus. Futog cabbage is the result of exclusively indigenous seed produced by farmers for generations. This variety of cabbage is valued for the special quality of its leaves, which are fine, elastic and flexible with a particularly sweet taste, and are thus very well suited to making *sarmas*, a traditional culinary preparation (either fresh or fermented). Other features of the variety are the particular fragility of its leaves, so that greater manual labour is entailed in its production, and yields that are lower than those of hybrid varieties (30 000 kilograms per hectare as against 40 000 kilograms).

Farmers demonstrate special know-how in seed production, soil preparation and harvesting, and also in the processing of fermented cabbage, thus helping to maintain the typicality of Futog cabbage.

Figure 1: PDO Futog cabbage production zone

Source: Authors.

2. History of the GI process

In the past, the traditional Futog cabbage was grown by all the farmers in the zone, but they gradually switched to new hybrid varieties, which are more resistant and have higher yields. The appellation of origin, Futog, was widely used for these hybrid varieties of cabbage, including by farmers in other regions of Serbia, thus endangering its reputation. The Futog cabbage variety was in danger of disappearing with time, and an association to protect it was created in 2007. With the support of a technical cooperation project, this association drew up specifications and made an application for recognition as a AO in order to protect the name, boost the reputation and preserve the local variety. The AO received recognition in 2012 and became the first certified AO in Serbia under the new law.

Legal and institutional framework

In 2010, the law on geographical indications was revised to bring it into line with European regulations. Appellations of origin (AOs) and geographical indications (GIs) were more clearly defined and certification became obligatory for use of the GI.

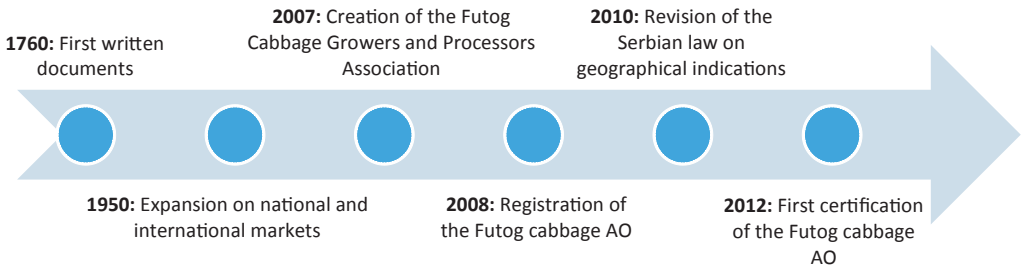
The Intellectual Property Institute, which falls under the Ministry of Trade, is the body responsible for registering GIs. It requests the technical opinion of the Ministry of Agriculture when assessing applications for the registration of food and agricultural products. It also provides support to applicants in order to facilitate the process.

Natural or legal persons, including producers' associations, can apply for registration.
Serbia has 49 registered GIs, only 4 of which were certified in 2015.

3. Value chain

The AO Futog cabbage value chain covers both fresh and fermented cabbage, the latter being marketed solely by the only processor in the sector. Most growers are old farmers who have been growing this type of cabbage all their lives on small plots (from less than 1 hectare to 8 hectares). Other vegetables are also grown, thus ensuring a rotation of crops, and also other varieties of cabbage to meet market demand (essentially for fresh cabbage, inasmuch as fresh Futog cabbage does not keep for very long). Their marketing outlets are sale to the processor (about 50 percent of their total sales), direct sale in open-air daily markets (green markets), farmgate sales

Figure 2: History of the Futog cabbage GI process



Source: Authors.

Specifications

The Futog cabbage specifications contain: demarcation of the geographical area; a description of the final products (fresh and fermented cabbage) with their chemical and sensory properties; the method used to obtain seed; a brief description of labelling standards and the sensory monitoring of products; and identification of the certification body. To produce fermented cabbage under the AO, the raw material must be certified. The Futog cabbage AO thus concerns fresh cabbage and fermented cabbage produced in a specified zone of 5 000 hectares around the town of Futog and in neighbouring districts.

The name of the local variety is not specified since it has not yet been catalogued, but the seed production system ensures that only the indigenous variety is used for the AO cabbage. The Futog cabbage variety is perpetuated thanks to a system of seed production by the farmers themselves with the technical support and supervision of the association, thus ensuring control of the seed used for use of the AO. The association can also supply seed for farmers who do not produce it themselves (50 grams at EUR 5). So far as cropping practices are concerned, a three-year crop rotation is envisaged (after pea, potato, onion, wheat and barley) in order to maintain soil quality.

Farmers wishing to benefit from the AO are not obliged to join the association.

and roadside sales, together representing about 44 percent of sales. A minor portion of production is consumed within the household. The processor produces 5 percent of the fresh AO cabbage, which it processes into fermented AO cabbage together with half the fresh production of other growers.

4. Governance of the GI

Management of the GI by market stakeholders

The Futog Cabbage Association is the GI defence and management body. It has about 150 members, encompassing the 35 fresh cabbage growers, the grower-processor, and supporters and defenders of Futog cabbage. The large number of supporters means that the mission of the association in many ways resembles that of a confraternity.

Its main functions are awareness-raising of the AO among farmers, promotion in the regional press, organization of events, training of farmers and internal monitoring, for which it organizes checks under the surveillance plan (internal inspection) and imposes penalties on those not respecting the AO standards.

The association is financed by subscriptions paid by the growers and the processor, donations from other supporters and outside support under various projects. It has an average annual budget in the region of EUR 10 000.

External and institutional support

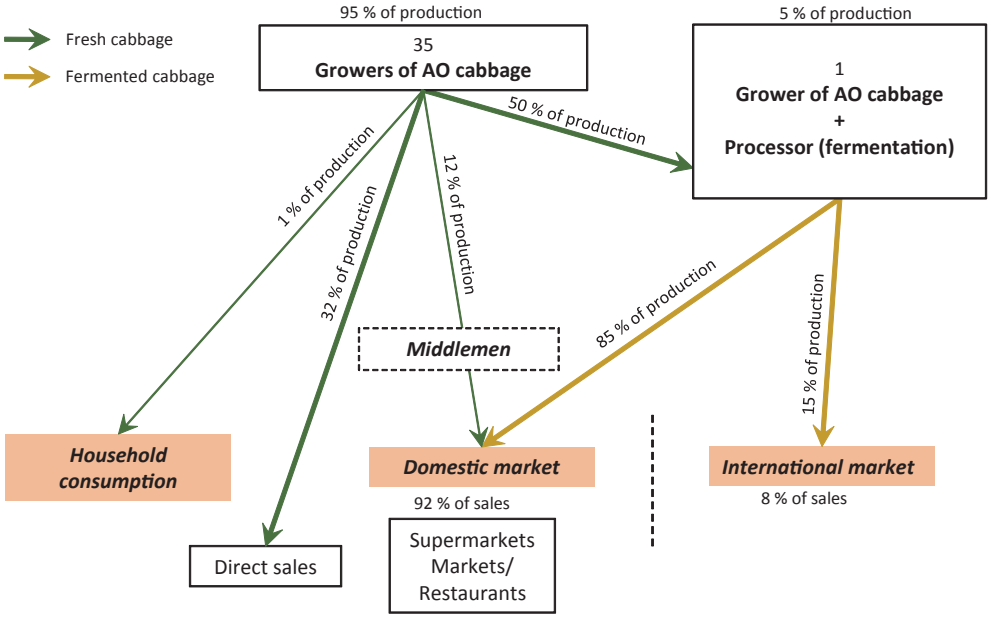
The Serbian Ministry of Agriculture and the Vojvodina Region provided major support to action to obtain recognition of the geographical indication (GI) in the framework of a development project financed by Switzerland (a project to support Serbia's admission to the World Trade Organization and the country's pre-membership efforts for admission to the European Union). Futog cabbage had been identified as a pilot product in implementation of the new legislation.

This support made it possible to cover the costs of drawing up the specifications and establishing controls, together with the costs of accreditation

Production and market: some figures

White cabbage is one of the main vegetables produced and consumed in Serbia, with an annual national production of about 300 000 tonnes. The Futog cabbage production area is less than 1 percent of the cabbage production area in the autonomous Vojvodina Province, or about 22.26 hectares in 2014, with a production of 468 tonnes (1 014 tonnes in 2013), or less than 0.5 percent of total cabbage production. Local and national markets are the main outlets for Futog cabbage. Export, which is carried out solely by the processor, accounts for 15 percent of fermented Futog cabbage production and 8 percent of fresh cabbage. The main importing countries are the United States, Austria and Hungary.

Figure 3: Diagram of the Futog cabbage value chain



Source: 2015 data based on field surveys

of the control organization. The growers have not so far had any expenses in order to certify their product, inasmuch as the relative costs have been covered by this project.

Monitoring and guarantee systems

The guarantee system is based on internal control by the association and control by a third party. The first certification took place in 2012.

To start with, the association carries out controls to ensure the production of good quality local seed. A commission selects the best cabbages from the various growers each season for the seed production fields. The seed producers must inform the association of the quantity they have produced, and those wishing to purchase seed must contact the association. In this way, the association can monitor the quantities of seed produced and required, and thus ensure its traceability.

The association makes sure that the cabbages have the typical organoleptic qualities of Futog cabbage through a sensory analysis commission, which assesses the taste, colour, form, odour and texture.

Third-party certification is provided by the Organic System Control certification body. During the three years when certification took place, its costs were partially financed by the Vojvodina Region, which covered about 40 percent of the total costs; another major part was paid by the processor, which passed this on by reducing the purchase price paid for fresh cabbage by 2 percent; and the association paid the remainder thanks to membership subscriptions.

5. Economic impacts of the GI process

In the case of Futog cabbage, the following economic impacts can be highlighted (Table 1).

Table 1: Economic impacts

Variable	Impact	Scale of the impact[15]	Method
Price	Average increase in the price of fresh cabbage paid to farmers in the green market[16]	+ RSD 6.1/kg following registration of the AO, or roughly + 57% From RSD 10.6/kg to RSD 16.7/kg	Mean comparison test
	Average increase in the price of fresh cabbage paid to farmers by wholesalers	+ RSD 4/kg following registration of the AO, or + 53% From RSD 7.6/kg to RSD 11.6/kg	Mean comparison test
	Average increase in the price of fresh cabbage in farmgate sales	+ RSD 6.1/kg following registration of the AO, or + 70% From RSD 8.6/kg to RSD 14.7/kg	Mean comparison test
	Average increase in the price of fresh cabbage paid in sales to the processor	+ RSD 1.6/kg following registration of the AO, or + 21% From RSD 7.5/kg to RSD 9.1/kg	Mean comparison test
	Average increase in the price of fresh cabbage paid in roadside sales	+ RSD 2.9/kg following registration of the AO, or + 26% From RSD 11.5/kg to RSD 14.4/kg	Mean comparison test
	Premium price of Futog cabbage compared with its substitute, the Bravo variety	Between 2006 and 2011, the prices of the two cabbages were similar From 2012, the price difference between the two cabbages increased: • 2012: premium of 18% compared with the substitute (fresh and fermented) • 2013: 20% compared with the fresh substitute and 24% compared with the fermented substitute • 2014: 16% compared with the substitute (fresh and fermented)	Master's dissertation
	Distribution of added value	In 2015, in the case of fermented cabbage, the farmer retained approximately 6% of the final price in supermarket sales, whereas the processor received 40% and the supermarket received 54% of this price	Master's dissertation
Production	Average, but not significant, decrease[17] in the volume of Futog cabbage produced	- 76.6% between 2010 and 2014 From 2 000 tonnes in 2010 to 468 tonnes in 2014	Descriptive statistics

Source: Authors.

Analysis of the data collected through surveys (20 of the 36 AO growers) allows a certain number of economic impacts to be shown, corroborated by econometric analysis. Growers who adopted the AO saw a major increase in prices over the 2012–2014 period (see Figure 4), with prices for fresh cabbage sometimes more than doubling in all distribution channels. Analysis of the difference in averages between years prior to registration and certification (2006–2011) and those after (2013–2014) shows a significant AO-linked price increase for fresh cabbage in all distribution channels (see the table above). It should be noted that this increase is least for sales to the processor (+ 21 percent) and greatest for farmgate sales (+ 70 percent) and for market sales (+ 57 percent). This immediate rise following the first certifications is because the reputation of Futog was already well established with consumers, who recognize its specific quality and have confidence in an official sign of quality – as the consumer survey shows (master's dissertation). Since the guarantee with the label has existed, consumers have accepted paying a higher price.

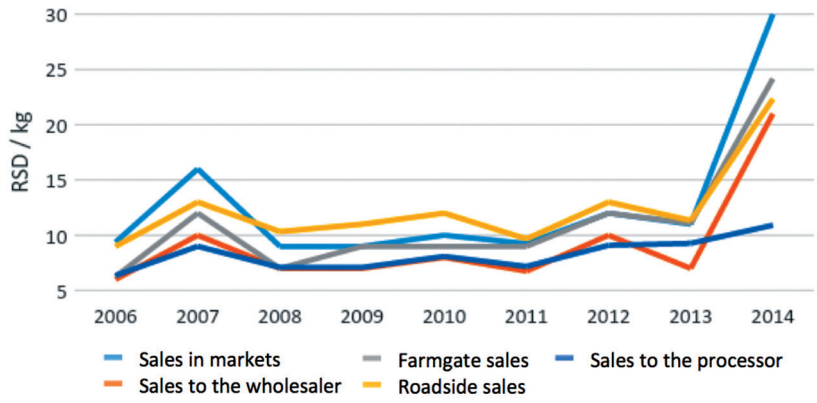
Moreover, according to these field data, until 2009 there was not such a great difference in price between Futog cabbage and other cabbages in Serbia. Following certification in 2012, fresh Futog cabbage saw a differentiation (with a premium of between 15 and 18 percent), as did fermented Futog cabbage.

15 Serbian dinar (RSD) = EUR 0.0081 (December 2016).

16 The green market is the open-air market where farmers or their relatives come to sell their produce (an informal market)

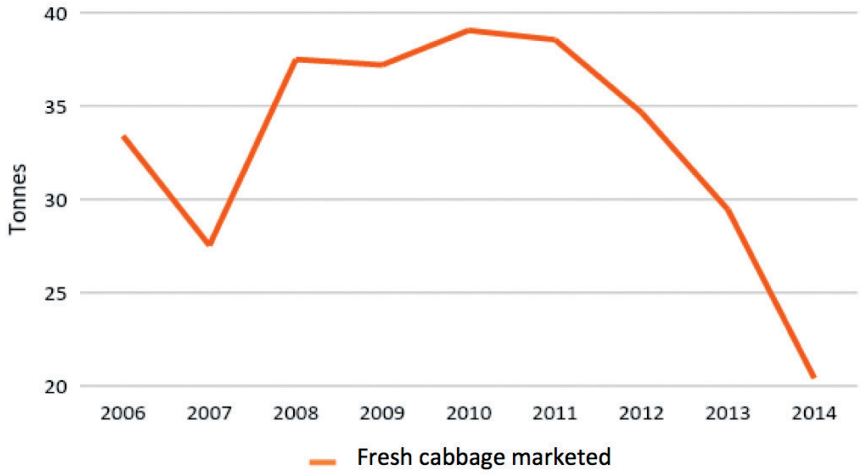
17 If the null hypothesis of no difference before and after GI is reject at the significance level of 5%, the results imply that variables have significantly increased after GI adoption. This increase may be partly explained by the GI adoption but not only.

Figure 4: Evolution in the average price of fresh cabbage in various distribution channels between 2006 and 2014



Source: field surveys 2015

Figure 5: Evolution in the quantity of fresh Futog cabbage marketed between 2006 and 2014



Source: field surveys 2015

Futog cabbage seeds

© Elena Ovochinnikova

Impacts on the *territory*

One of the first effects of the GI process is the preservation of the local variety, as against its disappearance in favour of a hybrid variety. This preservation may be confirmed in the long term, linked to the economic viability of the process.

Registration of the Futog cabbage AO is accompanied by some positive external effects to be seen in other non-AO value chains. The price of the Bravo substitute variety has increased at the same time as that of Futog cabbage, but less significantly, on average from RSD 8.62/kg before AO registration to RSD 11.83/kg after it, i.e. by about 37 percent.

The keenness of supporters and defenders to safeguard the variety has resulted in the maintaining of production and the development of tourism. An important event known as FORA explains to young people the importance of local traditions, how they are maintained and the importance of protecting them. Another important event is the *Kupasijada*, a fair where Futog cabbage growers present the product, sell it and cook traditional dishes.

Along with the price rise, there is a fall in the quantities of fresh cabbage marketed under the Futog cabbage designation. More specifically, protection of the name (in order to combat misuse of the designation) following adoption of the AO (fewer growers may use it) and the steady shrinking of the areas under cultivation have led to a fall in the sales of fresh Futog designated cabbage (see Figure 5). However, this reduction is not significant in relation to registration and certification, and growers have mentioned seasonal factors as major reasons.

Although the AO has created value, it may be noted that in the case of processed (fermented) cabbage this added value is for the most part retained by the processor and by supermarkets, according to calculations of its distribution along the value chain: the supermarket retains 54 percent of the value of the final price and the processor retains about 40 percent, while the growers retain only 6 percent. This portion paid to the growers of fresh cabbage could certainly be improved with better organization of growers in dealings with the processor, who benefits from a position of strength as the only one with the capacity to process the product for the market, given that Futog cabbage is highly perishable, so that growers have to sell it quickly to the processor.

6. Conclusion and future outlook

The strong link to the *terroir* with the existence of a local variety in danger of disappearing, the activities of the association to protect the variety and the product's well-established reputation among Serbian consumers are all reasons why Futog cabbage was identified as a pilot product under a technical support project and linked to implementation of the new Serbian GI legislation.

Despite the recent date of the AO, the economic impacts on prices are very clear – and this applies to all the outlets for fresh cabbage. The lack of data supplied for fermented cabbage unfortunately does not allow any in-depth analysis of the results for this product and its particular markets. It would be interesting to continue collecting data and thus contribute to a feasibility study to see if small farmers should launch into processing. Calculations of the distribution of value show that major gains in added value could be obtained with processing. Boosting its mediation role within the value chain, the Futog Cabbage Association could also foster greater appreciation and optimization of farmers' labour with a more equitable distribution of value.

The association also has an important role to play in raising the awareness of other farmers in the zone, encouraging them to join the process with a view to increasing production and improving the reputation on the market. Establishment of the AO in 2012 has not been viewed favourably by all potential cabbage growers, inasmuch as time is sometimes needed to convince people about collective action.

This young GI has great potential, but its viability needs to be confirmed with time, especially regarding certification costs, which have been covered in its first years. Will the product benefit from a fair price to cover production and certification costs in the future?

Lastly, with regard to the institutional framework and the national context, the fact that this GI was the only one used on the Serbian market in 2015 would point to the need for action to raise growers' and consumers' awareness regarding the significance of the GI, perhaps together with improvements in procedures with a view to reducing costs.

Methodology

Sources

- Field data collection (Ochinnikova, March-May 2015) :
  - in-depth interviews: 20 growers, 1 processor and 2 potential growers of Futog cabbage, 22 growers and 2 processors of Bravo cabbage, middlemen and experts
  - consumer survey: 15 close-ended questions with 301 consumers interviewed via personal contacts, given questionnaire and in electronic form
- Statistical Office of the Republic
- Official site of the Futog Cabbage Association

Types of analysis

- descriptive analysis
- diachronic evaluation (since 2010) and synchronic evaluation (Bravo, the main hybrid)
- analysis of the consumer survey with Statistica 12.0 software, Pearson's chi-squared test of goodness of fit with cross-tabulation of results
- mean comparison test

Acronyms

AO	appellation of origin
GI	geographical indication
RSD	Serbian dinar

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Kona coffee, Hawaii, United States

enhancing commercial prospects

The case in a few lines

- Soil and climate of Hawaii's Big Island favourable to growing a specific coffee, considered one of the most delicate in the world.
- Between 700 and 900 growers on about 1 800 hectares.
- Two value chains co-exist, one relates to the local sales of 100% Kona coffee directly from farmers; the other relate to the export market, where more than 1600 tonnes produced annually, exported mainly to Japan, the main consumer of green beans (60 percent) and roasted beans (90 percent).
- Certification mark since 2000 registered and managed by the Hawaii Department of Agriculture.
- 10 percent of Kona-type coffee is sufficient to obtain the *Kona Coffee* designation. The designation is used by two types of value chain: the first markets coffee containing a minimum of 10 percent Kona; the second offers coffee that is 100 percent Kona.

Economic impacts

- Kona coffee growers have obtained better results since adoption of the GI than during the pre-GI period with regard to income, price and quantities sold. The number of farms has also been on the steady rise since introduction of the GI.
- Increase in Kona coffee growers' income: + USD 20 500 between 1991 and 2007, rising from USD 7 500 per year in 1991 to USD 28 000 in 2007.
- The income increase is a result of:
  a) in first place, the existence of a higher premium price: + 50 percent compared with other Hawaiian coffees (price effect);
  b) in second place but less importantly, increased market access (volume effect).
- Independence from the international market (decommodification): a resilient value chain with limited influence from fluctuations in the commodity market.

Key messages

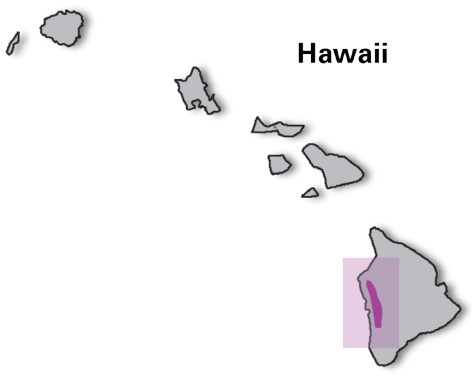
- Kona coffee has a price that is higher than and independent of the average international coffee price, because it is a high-end coffee intended for a niche market.
- Most Kona coffee is sold in the form of a blend of Kona coffee and foreign coffees.
- Boutique farms focusing on direct sales have grown up, covering all the stages from growing through to sales in order to market 100 percent Kona coffee.
- Protection of the name is not effective, since controls are not carried out for lack of financial resources.
- Two views of the geographical indication can be seen in this case, and this is a source of tensions among stakeholders in the value chain: 100 percent Kona versus Kona blends.

1. Link to the *terroir*

Kona coffee, considered one of the most delicate coffees in the world, is grown on west-facing slopes in the small zones of Hualalai and Mauna Loa on Hawaii's Big Island (see Figure 1). The soil and climate in these zones are particularly favourable to a very regular flowering of coffee bushes, ensuring constant production. Thus, the mornings are generally sunny, while clouds form in the afternoon to give daily showers. This phenomenon has the virtue of protecting plantations from the worst heat. The coffee plantations are located on the slopes of a volcano at altitudes of between 250 and 750 metres and are protected from easterly and northerly winds. The volcanic soils are rich in mineral and organic matter, allowing good drainage. The Arabica variety is the most widely grown in Kona. Its cultivation requires special care and attention. Traditional skill and know-how regarding pruning, manual harvesting and processing, combined with the natural conditions, contribute to the specific quality of Kona coffee. All coffee seedlings are produced in Hawaii. The artisanal nature of production and the large number of small-scale growers are the source of a whole range of nuances in flavour that are all faithful to the specific character of Kona coffee, which has a reputation for its sweetness, its caramel bouquet at first sip, followed by a floral aftertaste. The unique aromatic profile of Kona coffee springs from a variety of Arabica known as Typica or Guatemala Typica.

All these qualities make Kona coffee a unique product, known as the champagne of coffees.

Figure 1: Kona coffee production zone



Source: Authors.

2. History of the GI process

The history of Kona coffee started in the 1820s with the planting of the first bushes brought from South America. Since then, coffee cultivation in Kona has known several periods of instability. In 1969, a price stabilization strategy was put in place and Kona coffee became more competitive on the international market, inasmuch as its commercial status evolved from that of an agricultural commodity to that of a high-end speciality product. This strategy was formalized through a collective agreement between the cooperatives and Superior Coffee and Tea, an enterprise from Illinois that dominated coffee purchases and exports at the time. The agreement, established by a contract between the two parties, guaranteed the annual purchase of the whole production. As a result, the price of Kona coffee was no longer influenced by the price on the international coffee market, but was based on the needs of a specific market.

Legal and institutional framework

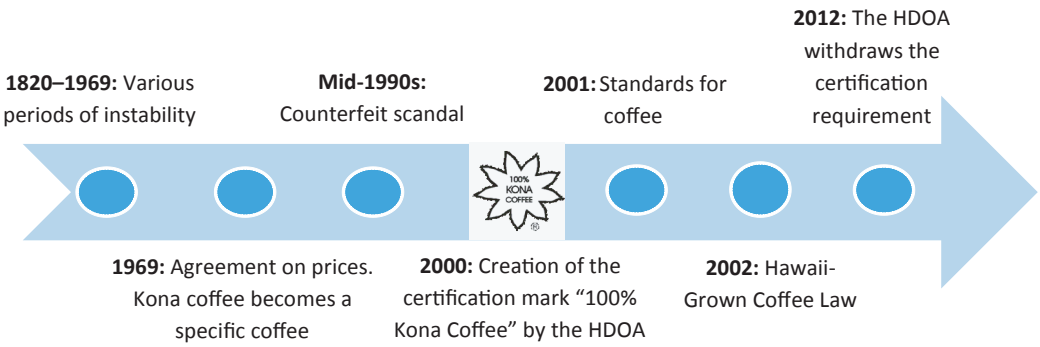
In the United States, geographical indications follow the trademark approach. The body responsible for managing trademarks is the U.S. Patent and Trademark Office.

In 2001, the HDOA published standards for coffee, listing the grading standard, labelling and inspection methods and associated costs, requirements for exports, penalties and the quality verification programme. Later, in 2002, the Hawaii-Grown Coffee Law came into force, specifying labelling requirements, definitions and penalties.

Later, in the mid-1990s, the demand for Kona coffee fell because of a counterfeiting scandal, with a trader selling coffee stamped "Kona Coffee" when it was in reality coffee imported from South America. This fraudulent practice was an extreme example of a current practice that sought to blend imported coffees with Kona coffee. In response, in 2000 the Hawaii Department of Agriculture (HDOA) registered the certification mark "100% Kona Coffee" for green coffee with the United States Patent and Trademark Office. The Hawaiian State Administration took this initiative in order to guarantee transparency and allow legal protection of the product in a context where private stakeholders had lost credibility.

Following the 2002 Hawaii-Grown Coffee Law, the blend of coffee containing at least 10 percent

Figure 2: History of the Kona coffee value chain



Source: Authors.

Specifications

Under the trademark approach, geographical indications are not necessarily based on an official document specifying the rules of production. In the case of Kona coffee, the term "Kona coffee" is taken as covering coffee produced in the Kona geographical area and falling within one of the quality classifications established by the coffee standard. This classification takes account of acceptable defects and minimum size. There are five quality grades for Kona coffee:

- Extra fancy: 8 grams of defects in 300 grams of coffee and size 19 (type 1) or 13 (type 2);
- Fancy: 12 grams of defects in 300 grams of coffee and size 18 (type 1) or 12 (type 2);
- Number 1: 18 grams of defects in 300 grams of coffee and size 16 (type 1) or 10 (type 2);
- Select: 5% of defective beans, size optional;
- Prime: 20% of defective beans, size optional.
- Any coffee not falling within this classification cannot be sold as Kona coffee.

Kona coffee and marketed under the name "Kona-type" or "10% Kona" became possible, undoubtedly to endorse long-established practices and protect a value chain that had been blending coffees with different origins for many years. This possibility of selling coffee blends with 10 percent Kona is the source of a dispute within the sector between defenders of 100 percent Kona coffee and export traders who support the marketing of the 10 percent type.

At the start of the 2010s, for lack of financial resources to carry out monitoring, the HDOA revoked the obligation to have state certification.

3. Value chain

In view of the absence of recent statistics and the non-aggregation of data on the number of growers in Kona and in Hawaii, we shall consider that 90 percent of the coffee produced on Hawaii's Big Island comes from Kona, as is suggested by certain local stakeholders and certain studies.

It is estimated that the Kona coffee sector has between 700 and 900 coffee farmers who grew coffee on 1 800 hectares in 2014, each farming small plots of less than 2 hectares on average.

There are two types of value chain (see Figure 3). The first and older one is marked by a very clear division of tasks: small farmers sell coffee cherries to processors, who turn them over to roasters, and then traders take charge of marketing. Traders play an essential role in the export of Kona coffee and thus hold considerable market power in this value chain.

The second type of value chain has developed over the past 20 years in reaction to the commercial approach of traders who seek to blend imported coffees with 10 percent Kona coffee. It is made up of direct sales shops, which cover all the tasks from growing through to marketing. These planters-retailers tend for the most part to defend 100 percent Kona coffee,

Production and market: some figures

Hawaii is the only American state producing coffee and the Kona region had a production of more than 1 700 tonnes in 2014, or more than half the coffee produced in the State of Hawaii (approximately 3 000 tonnes that year).

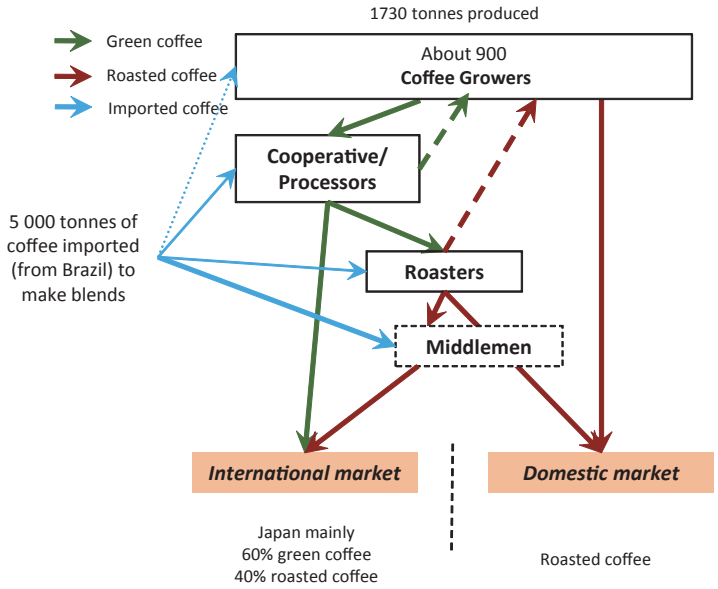
A portion of roasted Kona coffee is sold on the United States domestic market (precise data not available).

International market demand for Hawaiian coffees doubled between 2009 and 2014, and Japan remains by far the largest consumer of both green and roasted coffee from Hawaii, accounting for about 60 percent of exports of green Hawaiian coffee and 90 percent of roasted coffee.

In 2014, 4 040 tonnes of roasted coffee and 2 080 tonnes of green coffee from Hawaii, most of it Kona coffee, were exported.

The same year, at least 5 000 tonnes of coffee were imported from Brazil to make blends.

Figure 3: Diagram of the Kona coffee value chain



Source: Data from 2014 (USDA and NASS statistics) and 2015 based on field surveys

with some pursuing organic farming and playing a role in the tourist development of the Big Island.

4. Governance of the GI

Management of the GI by market stakeholders

The HDOA is the body responsible for protecting, promoting and boosting Kona coffee, and also for evaluating the quality of coffee beans and defining conditions for using the "100% Kona Coffee" label.

Conflicts within this body concern the labelling requirements that permit the blending of beans of different origins and qualities. Some people see these blends as a possible threat to the reputation of Kona coffee and defend the view that a blend of 10 percent Kona and 90 percent imported coffee cannot reflect the characteristics of 100 percent Kona coffee, while others see it as a marketing strategy that allows a major increase in the quantities of coffee stamped "Kona" at a lower price, making it more accessible to consumers.

The Kona Coffee Farmers Association (KCFA) defends the first approach. It was created in 2006 and has 335 members, 276 of whom are coffee farmers with voting rights. Farmers receiving more than half their income from coffee thanks to their Kona coffee plantation are considered to be Kona coffee farmers. The Kona Coffee Council (KCC) is another group made up of farmers, processors, roasters, traders and other professionals involved in the coffee sector. Both bodies have their own identification label guaranteeing "100% Kona Coffee". A third organization, the Hawaii Coffee

Association (HCA), represents the interests of the various stakeholders (processors, roasters, traders). There are tensions among these three associations regarding the use of the name Kona, which the KCFA would like to restrict solely to products containing a minimum of 51 percent of Kona coffee and ideally 100 percent. The KCFA holds that this measure would enable farmers to recover a greater portion of added value (Feldman, 2010).

External and institutional support

The government of Hawaii has supported the sector, initially by developing a protection process and then by assuming responsibility for certification. However, no action has been taken to counter wrongful use of the name, since the HDOA no longer has the resources to carry out controls.

Monitoring and guarantee systems

Since certification is no longer obligatory, it must be requested from the HDOA at a price of USD 48 per hour for those hoping to receive the benefit.

5. Economic impacts of the GI process

In the case of the Kona coffee GI, the following economic impacts can be highlighted (Table 1).

The differentiation strategy developed by the Kona coffee value chain, based on a territorialized niche market, has considerably improved stakeholders' income, especially in the case of farmers. As Figure 5 shows, income rose over a long period. The average income of Kona coffee growers as a group was USD 10.17 million between 1991 and 2000, as against an average of USD 20.30 million between 2000 and 2008. Moreover, Kona coffee farmers have a considerably higher income than coffee farmers on other Hawaiian islands.

The increase in income is a result partly of a willingness to pay more for Kona coffee (a price premium), but also, although to a lesser degree, of a greater access to the premium market (a volume effect).

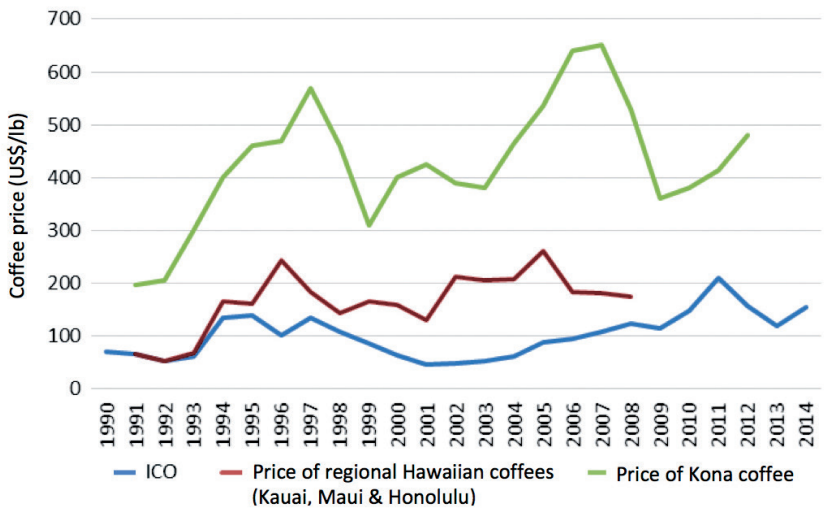
The fame of Kona coffee means that its price is two or three times higher than the prices of standard Hawaiian coffee and as much as five times higher than international coffee prices. The increase in the price of Kona coffee after the 2000s is striking (see Figure 4) and is a result particularly, but not solely, of the creation of the "100% Kona Coffee" certification mark and initiatives by the state to protect the name and promote and maintain the quality of Hawaiian coffees. Less important causes include the rise in production costs, which has been directly passed on to the price of the final product since the 1970s on the basis of the above-mentioned price agreement (see Figure 2). Other factors playing a part in

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Growers' income (green coffee)	Increase in income	• The income of Kona coffee growers as a group increased almost fivefold between 1991 and 2008, rising from USD 4.5 million to USD 21.1 million • By way of comparison, the income of all growers on the other islands, KMH, rose from USD 310 000 to USD 8 million over the same period	Descriptive statistics
Volume	Increase in market access	Large volumes marketed as Kona. Quantities of blends: confidential information • 4 040 tonnes of roasted coffee exported (most of it Kona coffee) in 2014 • 2 080 tonnes of roasted coffee exported (most of it Kona coffee) in 2014	Master's dissertation
		Access to new markets improved thanks mainly to on-line sales by boutique farms on the domestic market but also for export (+ 60% between 2011 and 2014)	Master's dissertation
Price	Higher premium price	The price of Kona coffee is two or three times higher than the prices of regional Hawaiian coffees (Kauai, Maui and Honolulu) and as much as five times higher than international coffee prices, between 1991 and 2008.	ICO, 2015; and HDOA, 2015
Resilience	Boosting of resilience	Independence vis-à-vis the commodity market	Cointegration test Master's dissertation

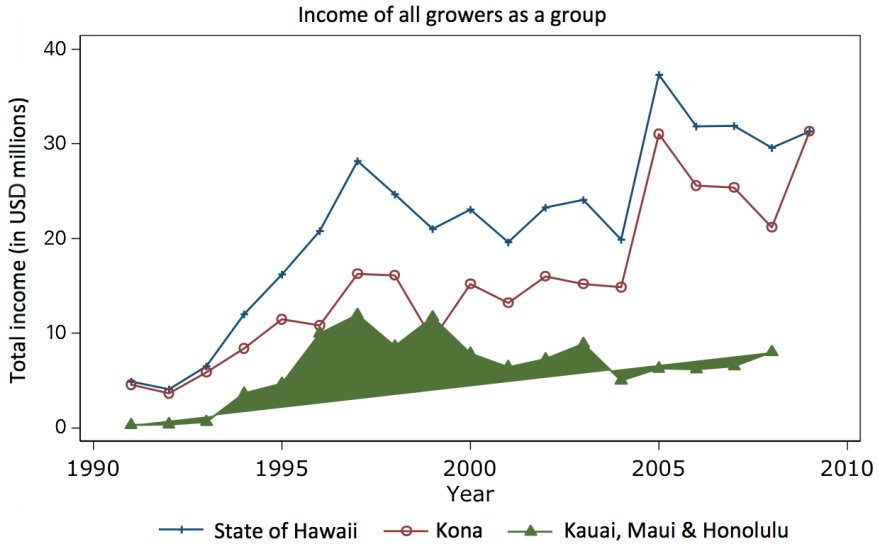
Source: Authors.

Figure 4: Evolution in the price of Kona coffee v. Hawaiian regional coffees (Kauai, Maui and Honolulu) since 1990



Source: ICO, 2015; and HDOA, 2015

Figure 5: Evolution in the income of coffee farmers in the State of Hawaii, in the Kona zone and in three other regions (Kauai, Maui and Honolulu) since 1990



Source: field surveys and data, USDA, Hawaii Field Office and Agricultural Development Division

Impacts on the territory

Boutique farms have developed over the past 30 years. They have the advantage of being vertically integrated, enabling them to reduce transaction costs but also to offer direct sales and thus increase remuneration to growers, although this effect cannot be attributed solely to the GI.

Other effects on local culture concerning coffee, including its innovation component, are considerable. For example, annual competitions are organized to reward the best coffees ("Cream of the crop") and new Kona coffee-based products are invented. A tourist economy is growing up around planters' boutiques. Knock-on effects of this direct sales dynamic work to the benefit of other products and services sold in the boutiques.

The existence of an income thanks to Kona coffee production is undoubtedly behind the tendency to keep lands that produce the GI under coffee plantations. This fact tends to militate against the sale of holdings and the expansion of farms. The effects of speculation and land rent are perhaps increased by insularity and the demarcation of a very small area.

Kona coffee cherry

© Andrea Kawabata

keeping prices high would be the development of exports (to Japan and Canada in particular) and the increasing presence of "boutiques" that optimize the specific characteristics of the *crus* and of local know-how and skill. Obtaining the GI undoubtedly played a part in this improvement in reputation and visibility. It is interesting to note that the prices of Kona coffee are higher than international prices in the long-term.

With regard to the volume effect, analysis shows that between 1995 and 2015 market access for Kona coffee improved considerably, with the quantities sold rising from 1 000 tonnes in 1995 to 3 500 tonnes in 2015. The growth of the value chain is based on wide-scale production, with a substantial increase in the number of growers of almost 30 percent in the past 15 years. This positive trend undoubtedly indicates the attraction of this crop for growers and the hope it gives of improved incomes. It should also be stressed that the plots of Kona coffee farmers are on average smaller than those of coffee farmers on other Hawaiian islands.

Lastly, analysis also shows a certain resilience of the value chain. Thus, rejection of the null hypothesis of cointegration between the Kona market and the commodity market implies an independence between the price of Kona coffee and world coffee prices, limiting the effect of fluctuations in international prices (ICO price, representing the average international price calculated by ICO) on the price of Kona coffee. Even so, the uniqueness of this product and its production system does make it vulnerable to shocks from outside, as can be seen in the price fall caused by the 2007 economic crisis (see Figure 4).

6. Conclusion and future outlook

The case of Kona coffee is a good illustration of the important role that the link to origin can play in the development of a value chain and how its various stakeholders benefit. This coffee, with its unique typicality and a market with a major high-added-value demand does not enjoy any strong protection of its name, leaving the downstream stakeholders to reap the economic benefits of the fame of Kona.

To maintain the reputation and high quality of Kona coffee, together with its excellent placement on the world market, some stakeholders in the value chain believe the law needs to be revised to have a geographical indication in line with the *sui generis* approach, which would allow real protection of the name. Strict controls are needed to protect the name and keep the value chain positioned in this high-added-value niche market. This case also shows how complex the power relations among the stakeholders in a value chain are and how difficult it is to reach a consensus working to the advantage of each one.

Methodology

Sources

- Survey data (Woodill, 2015):
  - discussion with industry leaders, field researchers and organizations
  - interviews with 20 stakeholders: 16 boutique farms, 3 processors, 1 cherry farmer
- USDA and HDOA
- Grading standards, labelling requirements, Kona certification and grading distribution, production values, export

Types of analysis

- Descriptive statistics
- Diachronic evaluation
- Cointegration test

Acronyms

GI	Geographical indication
HCA	Hawaii Coffee Association
HDOA	Hawaii Department of Agriculture
ICO	International Coffee Organisation
KCC	Kona Coffee Council
KCFA	Kona Coffee Farmers Association
KMH	Kauai, Maui and Honolulu
USDA	United States Department of Agriculture

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Manchego cheese, Spain

increasing export sales

The case in a few lines

- Cheese made from raw or pasteurized milk from sheep of the hardy Manchego breed, pressed paste type, not cooked.
- Very long-established reputation in the region (mentioned in *Don Quixote*).
- Dry region with an arid climate and difficult conditions to which the sheep have adapted over the years.
- About 11 000 tonnes produced each year, 70 percent of which is exported (mainly to the United States), by 785 farmers and 74 cheese dairies, on 4.4 million hectares.
- Appellation of origin (AO) in 1982 at the national level and protected designation of origin (PDO) in 1996 at the European level.
- Development of the value chain linked to major changes over the years: protection of reputation, new markets, arrival of large industrial groups, relaxation of the specifications.
- The government supports the value chain in the framework of the national agricultural policy.

Economic impacts

- Notable increase in the production of milk and Manchego cheese
- Concentration of milk production in numbers of sheep and farms
- Price of milk higher than the prices of non-PDO milks
- Price of Manchego cheese lower than those of other Spanish cheeses, but stabilized
- Resilience of the value chain in the face of prices on the international market: following the 2008 crisis, which hit Spain hard, Manchego cheese recovered its market shares fairly quickly

Key messages

- The geographical indication (GI) is based on a strong reputation and allows the protection and preservation of a specific breed suited to a particular environment.
- It allows protection of the name, especially vis-à-vis Mexican Manchego cheese.
- Changes in the specifications enabled the sector to cope with the 2008 crisis and open up an export market by developing an industrial approach.
- The trade association, made up of private and public stakeholders, plays a major role in protecting and promoting the product, particularly by developing the sectoral strategy.
- Links to the *terroir* have been weakened and traditional cheese makers have had to diversify their range, or even abandon the Manchego value chain altogether.

1. Link to the *terroir*

Referred to in books from the seventeenth century, including Cervantes' famous *Don Quixote*, Manchego cheese is marked by its history and has qualities unique among Spanish cheeses. It is a firm cheese made of compressed, uncooked paste, matured and produced exclusively from milk from the Manchego breed of sheep. This hardy breed from La Mancha, a vast plateau covering 4.4 million hectares at an altitude of 600 metres (see Figure 1), an arid but fertile zone, needs very little shade and water, so that it has been able to adapt to the arid climate of the region.

Figure 1: Manchego cheese production zone

Source: Authors.

The specific quality of Manchego cheese is linked to the quality of the milk, which has a higher fat and protein content than other sheep milk. The cheese obtained from the raw or pasteurized milk has a firm, compact consistency with only slight elasticity, a colour ranging from white to ivory yellow, a strong milky odour and a slightly acid flavour with a distinctive delicate aftertaste that gives it its particular aroma.

The rind has a distinctive aspect, reflecting the special way it is made in a traditional wicker mould, the *pleita*, which leaves its imprint on the rind.

2. History of the GI process

The fame of Manchego cheese grew in the twentieth century, especially in the Castile and León region, and its name was taken up by other types of cheese of different qualities. This is why the dairy farmers and cheese makers applied to the Spanish government in 1982 for a AO in order to protect the Manchego name, requesting: (1) the demarcation of the production zone, restricted to the Castilla-La Mancha (CLM) Region; and (2) that the milk should come solely from the Manchego breed of sheep.

Two years later, in 1984, the Manchego Cheese Designation of Origin Regulatory Council (the CRDOQM) was set up by the Spanish Ministry of Agriculture, Food and the Environment as the body responsible for the defence and management of Manchego cheese. It was then, on 21 December 1984, that the regulation recognizing the Manchego cheese AO was ratified by the Ministry of Agriculture, Food and the Environment. Since then, Manchego cheese has conquered the domestic market, expanding and establishing itself as one of the foremost Spanish cheeses.

Legal and institutional framework

In Spain, geographical indications (GIs) are protected under the *sui generis* approach by European Regulation no. 1151/2012. Two protection models are envisaged: protected geographical indications (PGIs) and protected designations of origin (PDOs). Special logos, one for the PDO and one for the PGI, are provided for in the European Union, whatever the product. In order to apply for a GI, producers and/or processors must join together in an association or other type of group. Monitoring to ensure compliance with the specifications is obligatory and is carried out by an accredited body in the country where the application has been made.

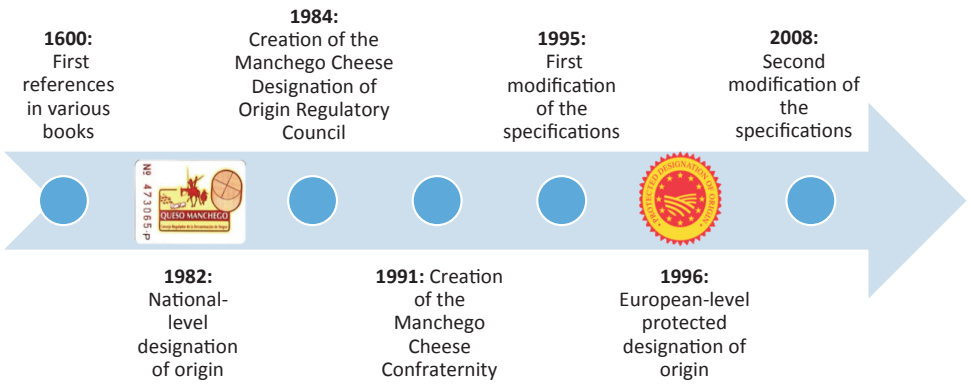
In 2014, Spain had 186 products with GIs, 28 of them cheeses. The body responsible for managing agrifood GIs is the Ministry of Agriculture, Food and the Environment.

Since 2008, the Spanish Government, the CRDOQM, the European Union delegation and the Origen España association have been negotiating with the Mexican Government for protection of the name Manchego for the Spanish cheese. This unfair competition has at the same time led to the opening up of a market that was already familiar with the name.

In 1991, the Manchego Cheese Confraternity, a non-profit organization, was founded to promote and update the image of the product on the basis of studies of the social, cultural and gastronomic resources of the region.

To bring the sector into line with European standards, in 1995 the CRDOQM was registered with the Department of Agriculture and the Environment of the Castilla-La Mancha Region as a "non-profit foundation with legal and public

Figure 2. History of the Manchego cheese value chain



Source: Authors.

Specifications

The Manchego cheese specifications contain: a description of the product (physical, chemical and microbiological characteristics of the milk and cheese and sensory characteristics of the cheese); the geographical demarcation; controls that prove that the product comes from the demarcated area; a description of how the product is obtained from milk through to maturation; the historical, natural and production characteristics justifying the link with the particular *terroir*; an indication of the monitoring and control structure; and labelling and forms of marketing.

The zone demarcated for production of Manchego cheese is the La Mancha Region, encompassing the provinces of Albacete, Ciudad Real, Cuenca and Toledo, with a total area of 4.4 million hectares. Only milk from Manchego breed ewes from licensed flocks, processed in the dairies and aged by cheese ripeners registered in this region are authorized to use the PDO. The milk must have a minimum dry matter of 11 percent (at least 6.5 percent fat and 4.5 percent protein). Physical, chemical and sensory analyses are carried out at each stage in production. The use of paraffin or olive oil to coat the cheese is authorised.

The specifications have undergone two major modifications since they were first established. The first, in 1995, changed the dimensions authorized for the cheese, so that the minimum weight was reduced from 2 kilograms to 1 kilogram, with the maximum set at 3.5 kilograms to meet requests from industrial dairies in order to facilitate marketing.

The specifications were modified for a second time in 2008, when details were added concerning flock management and the permissible dimensions of cheeses were again broadened.

With regard to flock management, the specifications authorized food supplements for the sheep (concentrate, hay and by-products), thus allowing an intensification in production, an increase in milk yields and a reduction in milk production costs, developments that seem to have weakened ties to the *terroir*.

With regard to the manufacture of the cheese, wheels of 0.4 to 4 kilograms were authorized, thus modifying the manufacturing method. The traditional mould, the *pleita*, was gradually replaced with a plastic mould for reasons of hygiene but also to modernize the whole process. The maturation time was also reduced for smaller cheeses. The marketing of sliced or grated cheese was also introduced in this most recent updating.

autonomy". In 1996, Manchego cheese was recognized as a PDO at the European level.

3. Value chain

The PDO value chain is distinguished by a variety of production, processing and marketing models. In 2014, it encompassed 785 dairy farmers. Most of the milk goes to cheese dairies to make GI Manchego cheese. A portion also goes to make other cheeses, although data on this portion are not available.

The pasteurized milk is processed by 39 industrial cheese makers, which are defined as such in the specifications, independently of the quantity of milk processed. The 25 dairies that process raw milk are known as traditional cheese makers

On the one hand, the industrial cheese makers purchase milk from the farmers and their production represents roughly 85 percent of the total production of Manchego cheese. On the other hand, the traditional value chain is fairly

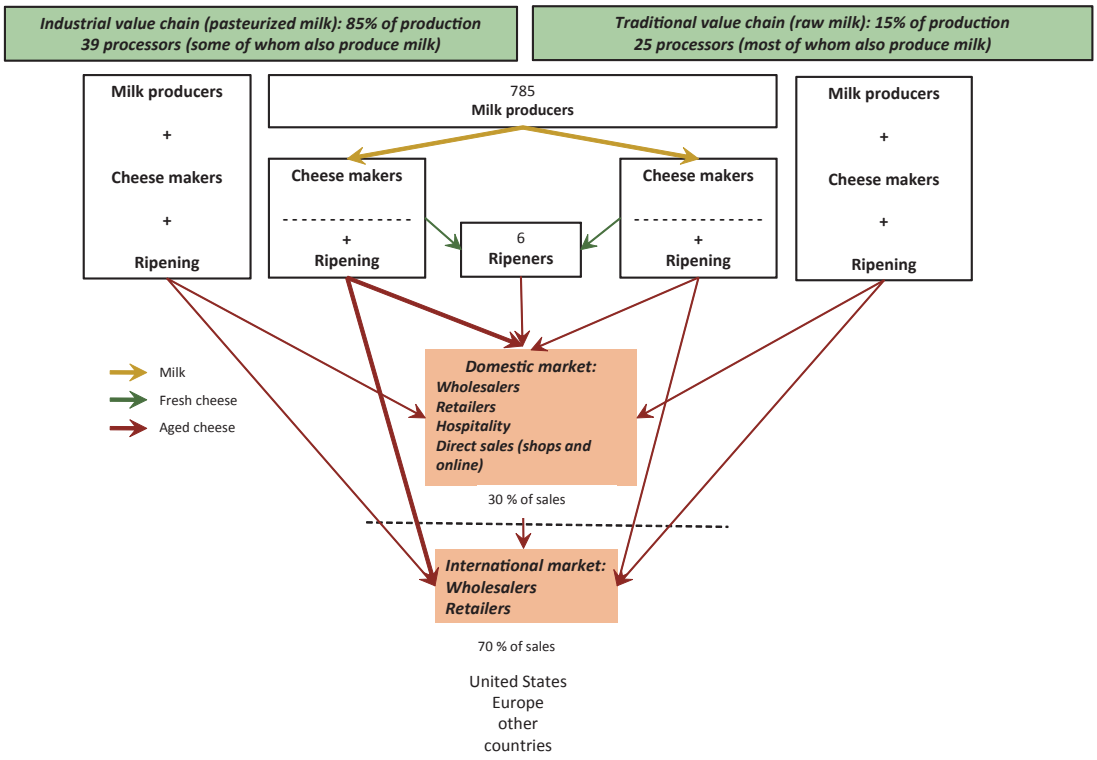
Production and markets: some figures

Manchego is one of Spain's best-known cheeses. With an average annual production of 11 000 tonnes, it has been the Spanish GI cheese with the largest market share – more than 50 percent – for more than ten years.

Until the 2008 global crisis, the domestic market was the main outlet, absorbing 70 percent of annual production. Following the crisis, the market share of Manchego cheese in Spain shrank by 7 percent in 2009, while the export share expanded significantly, increasing from about 30 percent of production, or 2 222 tonnes, in 2002, to 70 to 75 percent in recent years, with almost 8 000 tonnes exported in 2013. Sales on the domestic market have recovered, so that, combined with the increase in exports, production has risen by 40 percent since the 2000s.

The main purchaser is the United States, accounting for almost 4 000 tonnes per year. American consumers are in fact familiar with the name Manchego because there is a very well-known Mexican cheese with the same name, although it bears little resemblance to the Spanish Manchego.

Figure 3: Diagram of the PDO Manchego cheese value chain



Source: 2015 data based on field surveys

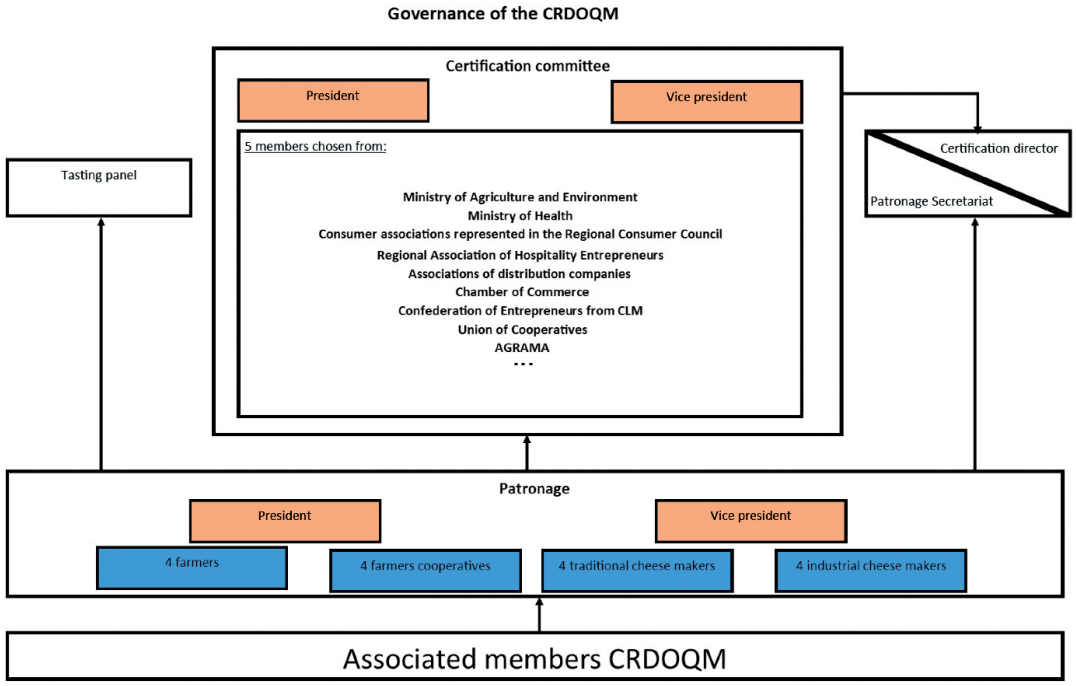
integrated, inasmuch as most of the 25 traditional cheese makers produce their own milk and process it into cheese.

The number of cooperatives has fallen over the years, so that now only two artisanal integrated cooperatives are left. With the increase in the price of milk and the influence of the industrial dairies, farmers no longer see much advantage in joining together in cooperatives.

So far as ageing is concerned, most of the cheese makers, both industrial and traditional, carry this out themselves, although there are six specialist ripeners who age a fairly limited quantity.

Among industrial enterprises, the Lactalis group, one of the most influential in the world in the dairy sector, has been present since 2010 after purchasing the Forlasa company, one of the moving forces behind the PDO process and the Manchego PDO leader at the time. The presence of Lactalis has had a major influence on the commercial strategy of the sector, with its emphasis on the export market.

Figure 4: Organization of the Manchego Cheese Designation of Origin Regulatory Council



Source: Authors.

4. Governance of the GI

Management of the GI by market stakeholders

The CRDOQM, the body responsible for management of the PDO, has the task of encouraging the economic and social development of the community through the prestige of Manchego cheese. To this end, it manages the specifications, certifies the compliance of cheeses through a certification committee, carries out promotion and encourages research on the product.

Today the CRDOQM is registered as a foundation established with a starting capital of EUR 30 000, added to which are the assets and rights of the Regulatory Council, organized into three main bodies: the Executive Board, the Product Certification Department and the Certification Committee. The Executive Board is the body responsible for drawing up the specifications and certifying products under the supervision of the Ministry of Agriculture, Food and the Environment. It has 16 members, divided evenly among farmers, cooperatives and food processing companies, traditional cheese makers and industrial cheese makers. The board is elected by the associates every four years. The Certification Director is responsible for the everyday tasks of certification and reports to the Executive Board. The Certification Committee guarantees the impartiality of the CRDOQM, formulates quality policies and takes part in selecting the Certification Director.

The National Association of Manchego Sheep Breeders (AGRAMA) and the Provincial Agricultural Technical Institute (ITAP) also play a part in governance of the GI, but more indirectly.

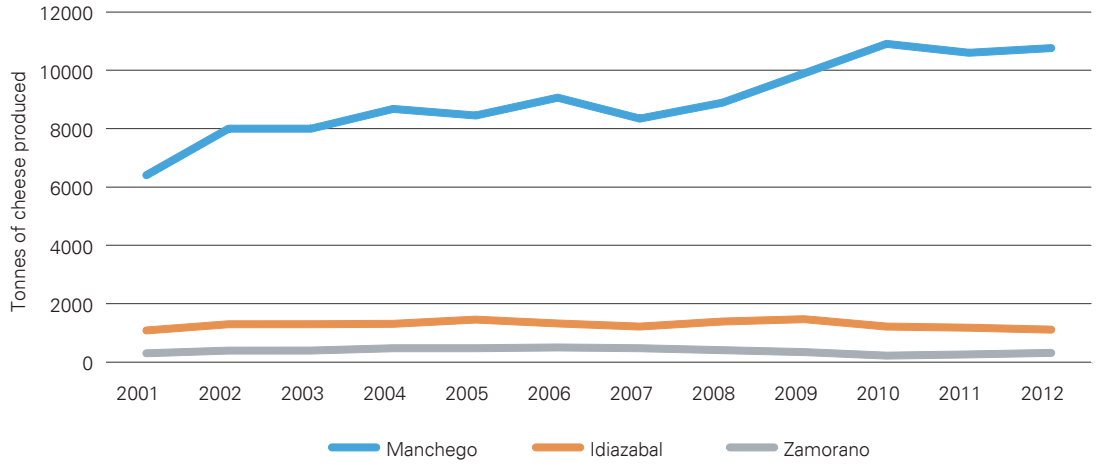
The AGRAMA carries out important work to maintain the breed, promoting it through competitions, providing training and giving technical support to farmers. It also works on genetic improvement through optimization of the flock book and artificial insemination. It is responsible for the electronic identification of each animal and for monitoring marketing.

The ITAP is the body responsible for fixing the prices of Manchego milk on the basis of its content of dry matter. However, this price is not imposed, but provides a point of reference for negotiations between farmers and industrial cheese makers.

External and institutional support

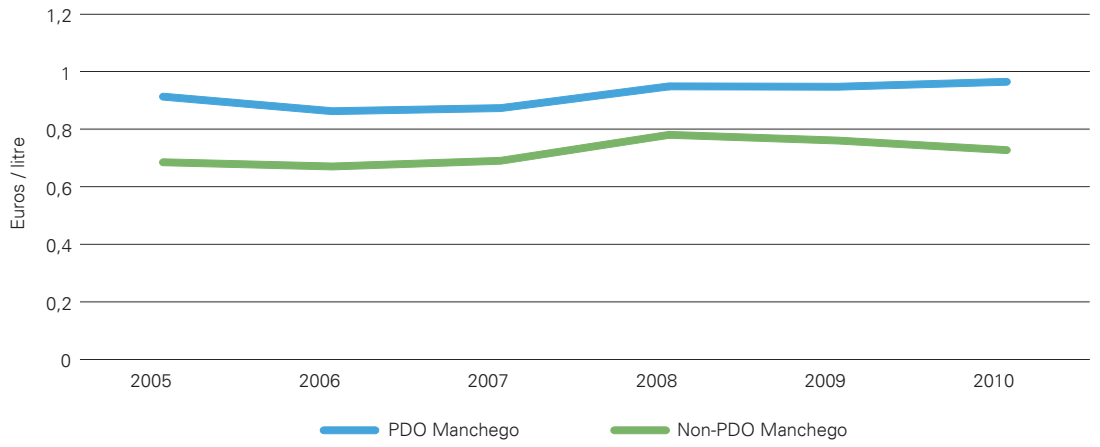
Dairy farmers also receive aid from the CRDOQM for each litre of milk declared in PDO (EUR 0.03

Figure 5: Evolution in the production of Manchego, Idiazabal and Samonaro cheeses between 2001 and 2012



Source: Ministry of Agriculture, Food and the Environment, data on food product PDOs and PGIs, 2001-2013

Figure 6: Evolution in the price of Manchego milk between 2005 and 2010



Source: Ministry of Agriculture, Food and the Environment, data on food product PDOs and PGIs, 2001-2013

per litre). This support helps, on the one hand, to maintain the breed by preventing the cross-breeding of sheep with more productive breeds, and, on the other, to verify that cheese makers respect the obligation to process at least 75 percent of Manchego milk into Manchego cheese and not use it to make other cheeses. The CRDOQM provides financial support for the purchase of rams preselected by the AGRAMA with a sum of EUR 120 per ram. In addition, farmers rearing black Manchego sheep receive a subsidy in view of their activity of maintaining the endangered species.

The CRDOQM receives financial support from the regional government. The amount of this support varies from year to year and depends on the economic situation in the region. With regard to GIs in general, the Ministry of Agriculture, Food and the Environment promotes Spanish GI products both within and outside the country.

Monitoring and guarantee systems

Quality control and certification are carried out by the CRDOQM Certification Committee, which has been recognized by the National Accreditation Body since 2009. The committee is made up of a president, a vice-president and five members who are elected every four years from 11 different bodies: the Ministry of Agriculture, Food and the Environment, the Ministry of Health, consumer associations,

Castilla-La Mancha University, the Regional Association of Hospitality Entrepreneurs, associations of distribution companies, the Chamber of Commerce of Castilla-La Mancha, the Confederation of Entrepreneurs of Castilla-La Mancha, professional agricultural organizations, the Union of Cooperatives of Castilla-La Mancha and the AGRAMA.

5. Impacts of the GI process

In the case of Manchego cheese, the following economic impacts can be highlighted (Table 1).

A significant increase in the production of milk and Manchego cheese between 2001 and 2013 should be noted, whereas the production of other cheeses of the same type, such as Idiazabal and Zamorano, remained stable (see Figure 5).

Modification of the specifications with more flexible livestock rearing and cheese making conditions led to an increase in production in 2008. These changes were fairly major, enabling industrial producers to adapt their strategy in response to consumer demand, while reducing their production costs. This allowed them to expand and also to bring themselves into line with the international market. However, this success of industrial cheese makers took place at the expense of traditional producers, who found themselves obliged to diversify their range of products, with some of them even leaving the Manchego value chain.

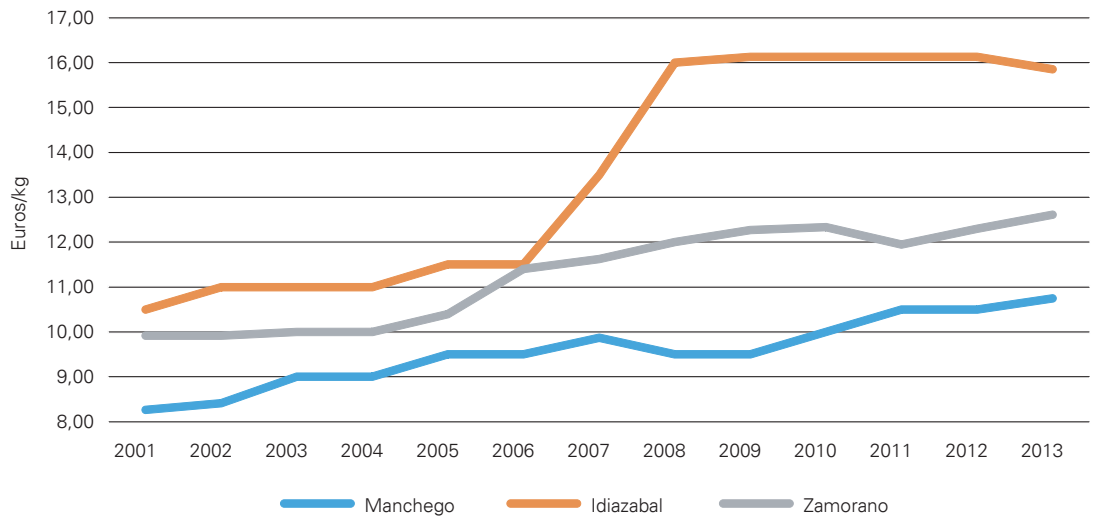
Production has been concentrated in recent years in terms of numbers of both sheep and farms. The number of dairy farmers fell by 40 percent between 2002 and 2009, and their flocks also shrank by 14 percent over the same period. However, thanks to genetic improvement efforts, the milk yield per ewe increased, so that in 2009 the same quantity was produced as in 2005 but with 70 000 fewer ewes.

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Production	Decrease in the number of farms	- 44% between 2000 and 2013 From 1 430 farms in 2000 to 798 in 2013	Descriptive statistics
	Increase in the volume of production	+ 83% between 2001 and 2013 From 5 880 tonnes in 2001 to 10 757 tonnes in 2013	Descriptive statistics
Price	Increase in the farmgate price of milk	+ 5.5% between 2005 and 2010 From EUR 0.91 per litre in 2005 to EUR 0.96 in 2010	Descriptive statistics
	Increase in economic value	+ 525% before/after the European PDO (1996) From an average EUR 11 395 million before to an averageEUR 71 287 million afterwards	Mean comparison test
	Increase in the cheese price paid by consumers	+ 45% before/after the European PDO (1996) From about EUR 10.6 per kilogram before to about EUR 15.3 afterwards	Mean comparison test
	Increase in the average price paid by retailers to wholesalers	+ 45% before/after the European PDO (1996) From about EUR 7.8 per kilogram before to about EUR 11.3 afterwards	Mean comparison test
	Increase in the average price paid by wholesalers to producers	+ 45% before/after the European PDO (1996) From about EUR 6.3 per kilogram before to about EUR 9 afterwards	Mean comparison test
Resilience	Increase in the market share of Spanish GI cheeses	+ 5% between 2001 and 2013 From 50% in 2001 to 55% in 2013	Mean comparison test
	Exports	× 14 before/after the European PDO (1996) From 165 tonnes before to 2 320 tonnes afterwards	Mean comparison test

Source: Authors.

Figure 7: Evolution in the prices of Manchego, Idiazabal and Zamorano cheeses between 2001 and 2013



Source: Ministry of Agriculture, Food and the Environment, data on food product PDOs and PGIs, 2001-2013

Impacts on the territory

The development of tourism may also be seen as an indirect impact of the reputation of Manchego cheese. The Manzanares prefecture opened the Manchego Cheese Museum in 2014. As an illustration, it had more than 10 000 visitors in its first year, whereas the Manzanares City Museum had only 400 visitors in 2010.

Despite the fact that there is no mechanism within the value chain to control milk prices and also that the industrial cheese makers have more negotiating power within the value chain, farmers do enjoy a milk price that is higher than that of non-PDO milks (see Figure 6). This higher price is a result mainly of the major market demand, essentially pushed up by the industrial cheese makers, but also of the subsidies that farmers receive from the CRDOQM.

Cheese prices do not follow the same trend as milk prices. Other cheeses in the same category as Manchego have higher prices (see Figure 7). The lower prices of Manchego may be ascribed to the larger-scale strategy of its operators, whose aim is to produce large quantities in order to reduce production costs (economies of scale) and be able to offer more competitive prices on markets. This strategy has allowed an increase in quantities and particularly in exports without cutting prices too much. In addition, it has also enabled the farmers remaining in the value chain to expand the size of their farms and achieve increases in productivity while benefiting from prices higher than that of standard milk.

Moreover, the sector has proved resilient in the face of prices on the international market. Following the 2008 crisis, which affected Spain very badly, Manchego cheese recovered its market shares fairly quickly. The international market in fact played a major role in overcoming the crisis, inasmuch as exports increased by 350 percent in 11 years, rising from 1 070 tonnes in 1998 to 3 800 tonnes in 2009.

Yet another impact concerns protection of the name Manchego. In Mexico, the Manchego designation has a considerable reputation, because the Mexicans also have a cheese known as Manchego, although it bears little resemblance to the Spanish cheese. A network of various institutions, such as oriGIn[18] and the Spanish Patent and Trademark Organization, support the activities of the CRDOQM for protection of the name. This protection may also explain why the United States market, particularly with the

18 The Organization for an International Geographical Indications Network is a non-governmental non-profit organization based in Geneva. It was set up in 2003 and has become a world partnership for GIs from a wide range of economic sectors, representing some 400 producers' associations and other institutions linked to GIs in 40 countries.

Manchega sheep in their production area

© Fundacion Queso Manchego

community of Mexican origin, which was already familiar with the name Manchego, increased by 314 percent between 2002 and 2013. The PDO can therefore be seen as a tool to differentiate a quality product, upholding its renown and opening up new markets for it.

6. Conclusion and future outlook

To start with, registration of the GI allowed the Manchego cheese value chain to expand. The recent evolution of the PDO created an opportunity for industrial groups, which have taken over the tool, and also led to the exclusion of stakeholders who were the guarantors of the continuation of traditions.

Farmers have been able to increase the size of their flocks thanks to the growing market demand.

They have also increased their productivity by reducing their dependence on local fodder resources. There are question marks over the longer-term consequences of a weakening of links to the *terroir* and of the artisanal nature of production, which is being squeezed out in favour of the increasing power of industrial cheese production, increasingly guided by commercial requirements, thus steadily moving the cheese further from its original characteristics but allowing it to hold its own in a competitive market that suffers periods of crisis.

Methodology

Sources

- Survey data (Ponce, 2015):
  - 75 producers provided information on the phone
  - Face-to-face interviews with 14 stakeholders: Manchego cheese regulatory body, Manchego cheese museum, 5 traditional cheese makers, 3 industrial cheese makers, 2 cheese experts, and 2 ripeners
- Private reports from the CRDOQM
- Annual reports from the Spanish Ministry of Agriculture, Food and the Environment 2001-2013
- Record of prices from the Provincial Technical Agricultural Institute (ITAP)
- Reports of programmes implemented by the National Association of Manchego Sheep Breeders (AGRAMA)

Types of analysis

- Diachronic evaluation (since 2000)
- Synchronic evaluation (with Idiazabal and Zamorano cheese)
- Descriptive statistics
- Mean comparison test

Acronyms

AO	Appellation of origin
AGRAMA	National Association of Manchego Sheep Breeders
CLM	Castilla-La Mancha Region
CRDOQM	Manchego Cheese Designation of Origin Regulatory Council
GI	geographical indication
ITAP	Provincial Agricultural Technical Institute
PDO	protected designation of origin
PGI	protected geographical indication

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Penja pepper, Cameroon

supporting the overall development of the national pepper sector

The case in a few lines

- Pepper from a generic variety introduced into Cameroon in the 1950s, which has spread widely since the 2000s in a specific *terroir*.
- A small production: about 200 growers producing between 200 and 300 tonnes per year of pepper "of origin".
- The domestic market is still the main outlet, followed by a regional market in neighbouring countries.
- A major project to develop GIs in Africa, the PAMPIG project, launched in 2008, has provided the value chain with a proper structure and enabled appropriate specifications to be drawn up.
- The geographical indication was registered in 2013 in order to protect the name and boost the reputation of Penja pepper.

Economic impacts

- Increase in the number of pepper growers and in the volume of pepper produced
- Increase in selling prices
- Diversification of markets
- Dissemination of technical innovations

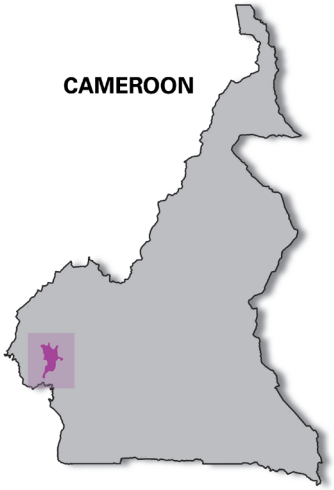
Key messages

- Dissemination, through the specifications, of efficient cropping and post-harvest practices improves the profitability of small-scale plantations.
- Establishment of the GI leads to a substantial local increase in production, which should now be channelled into a certified value chain.
- The trade association encompasses associations of growers, nurseries and distributors, facilitating decision-making and coordination of the value chain.
- A detachment from international prices could take place in forthcoming years but has not yet clearly started.

1. Link to the *terroir*

Penja pepper was introduced into the region by a French entrepreneur in the 1950s and is grown in the Moungo district in Cameroon's Littoral Region (see Figure 1), where the soil, altitude and climate are particularly suited to growing pepper. Penja pepper is marked by its animal aroma, combined with a certain tang when eaten. It may be green (if it is harvested before it is ripe), red, white or black (depending on whether it has undergone fermentation), but it is mainly the white pepper that is produced and that has a considerable reputation. Its typicality comes from the *terroir*: its variety is not native to the region and it is mainly the soil that gives rise to this typicality. Penja pepper is much appreciated in Cameroon and its quality is recognized by many purchasers and experts. In Europe it is considered to be a pepper and is sold as such at a price several times higher than that of pepper of no particular origin.

Figure 1: Penja pepper production zone



Source: Authors.

2. History of the GI process

Foreign entrepreneurs settled in the area in the 1970s and started growing pepper. At the end of the 1990s, new players appeared on the scene: Plantations du Haut Penja (PHP) an enterprise with French capital that mainly produces bananas, purchased existing pepper plantations, while local entrepreneurs also invested in the sector. During the 2000s, the rise in prices boosted the interest of local small farmers in pepper and their numbers increased steadily in the zone. On the domestic market, it is often mixed with imported pepper of inferior quality and then, despite this, sold under the name Penja. This misappropriation of the name Penja within the country and the filing of a trademark by an importer in France prompted growers to initiate a protection process. The Support Project for Establishment of Geographical Indications (PAMPIG), launched in 2008, identified Penja pepper as one of four pilot products for which a GI could be registered.

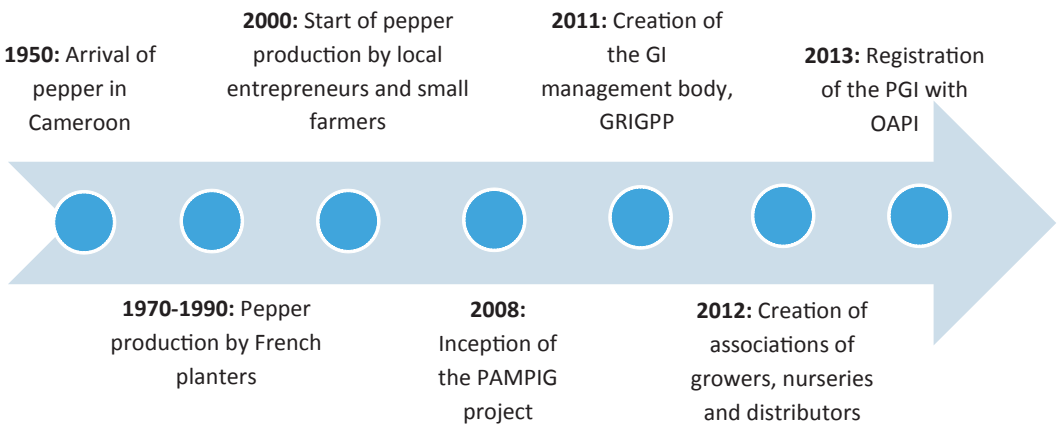
Legal and institutional framework

The African Intellectual Property Organization (OAPI), of which Cameroon is a member, was established in 1977 following the Bangui Agreement. Its aim is to establish a uniform intellectual property protection system among its 17 member states. Geographical indications are protected under a *sui generis* approach following revision of the agreement in 1999.

The PAMPIG project run by OAPI is intended to establish the first GIs in its member states and also to raise the awareness of government officials and provide training for them, constitute national GI committees to evaluate GI applications, and identify new products. The project was financed by the French Development Agency (AFD) and run by OAPI with technical support from the International Cooperation Centre on Agrarian Research for Development, Montpellier (CIRAD), and France's National Institute for Quality and Origin (INAO).

The Group Representing the Penja Pepper GI (GRIGPP) was established in 2011 to apply for the GI, and actions were taken the next year to provide the value chain with a proper structure: training for growers, loans for fertilizer and the creation of associations of nurseries, growers and distributors. The GRIGPP is made up of about 200 growers, 32 nurseries and 72 distributors. Registration of the GI in 2013 had major consequences in terms of the dissemination of information throughout the country, boosting the reputation of Penja pepper and its attraction for both producers and consumers. However, it has not so far been possible to get the monitoring and certification system up and running, so that there is no visible distinction between GI Penja pepper and non-GI pepper. A verification and packaging centre was opened in early 2017 and this should rectify the situation.

Figure 2: History of the Penja pepper value chain



Source: Authors.

Specifications

The specifications were drawn up in the framework of the PAMPIG project in 2010–2011 on the basis of recommendations from agricultural and technical experts and of practices observed in the largest plantations prior to the GI process. Consultation of all the growers led to the partial revision of these recommendations and the inclusion of variations more appropriate for small farmers.

The specific variety can give four types of pepper: white, green, red and black. Harvesting must be carried out by hand and should respect the stage of ripeness of the plant depending on the type of product sought. All the stages in production (production of the raw material, retting, washing, drying and wholesale packaging) must take place in the geographical area south of Mount Koupé between the Littoral and Sud-Ouest Regions on land in six communes, at altitudes of between 100 and 500 metres.

Growers must be registered with the GRIGPP in order to benefit from the GI.

3. Value chain

Pepper was introduced in the 1950s and its production expanded in the Penja zone in the 2000s, with new players: one very large enterprise, Cameroonian planters and many small farmers.

There are two distinct types of producer of Penja pepper:

- large- and medium-scale plantations: the two largest enterprises in the region (PHP and Metomo) have areas of more than 30 hectares under pepper; there are also a few dozen medium-size plantations (with between 5 and 10 hectares each) in the region; most of these stakeholders have adopted technical procedures in line with the specifications;
- 5700 small and very small farmers, growing pepper on areas of between 0.25 and 2 hectares in combination with other crops; this category covers several thousand growers, indicating a major enthusiasm for pepper; however, the volumes produced by the vast majority of these farmers are small (because of the small areas, insufficient technical know-how and/or the fact that the plantations are new).

Some wholesalers, who have been present in the area from the start, have the advantage of large diversified supply and distribution networks (many growers, collectors, local and national distributors, and retailers). Their markets are domestic and subregional and include mass outlets and a domestic niche market where high quality can be maximized (without, however, having recourse to GI certification).

Exports to Europe follow other channels, in which the large-scale growers are in direct contact with importers.

New wholesalers appeared following the rise in pepper prices in the 2010s. Their supply networks are confined to the large-scale growers.

Production and market: some figures

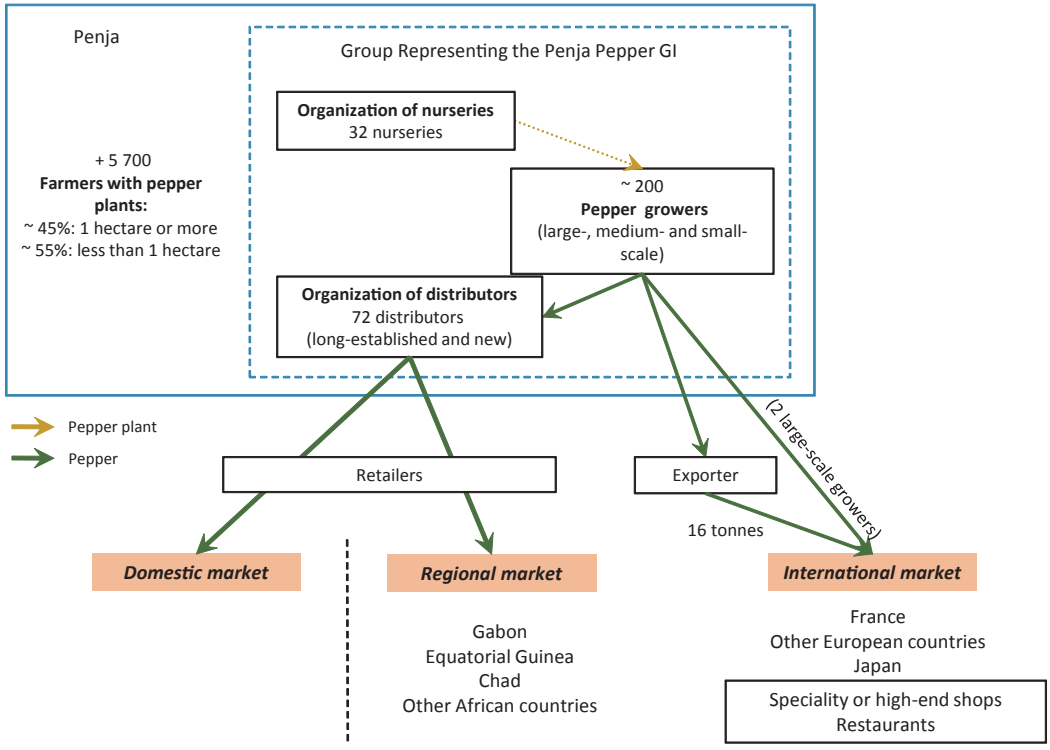
In 2015, about 407 000 tonnes of pepper were produced in the world.[19] Vietnam is the largest pepper producer (32 percent of world production), followed by Indonesia (18 percent), India (16 percent) and Brazil (10 percent). Cameroon's production constitutes a minute portion of world production.

The international market price goes in cycles. The current cycle saw a low point in 2001. Since then, there has been an exceptionally long rising phase, leading to record prices in 2015 that were almost double the previous maximum (recorded in 1997) and more than seven times the 2001 minimum. Demand is thus growing, especially in Asia (+ 3–4 percent per year) and the supply is relatively inelastic because of various problems (disease, climate fluctuations and change, competition from other crops etc.).

Peppers "of origin" constitute about 20 percent of world production.[20] The pepper produced in the Penja zone constitutes only a very minor portion, with a production of between 200 and 300 tonnes in 2015.

The domestic market absorbs most of the Penja pepper produced. Exports are to the subregional market (especially the neighbouring countries of Chad, Equatorial Guinea and Gabon) and the European market (16 tonnes exported to Europe in 2014, with France as the main destination).

Figure 3: Diagram of the Penja pepper value chain (PGI and non-PGI)



Source: 2015 data based on field surveys

Their arrival on the scene has to some extent rebalanced power relations in the value chain.

4. Governance of the GI

Management of the GI by market stakeholders

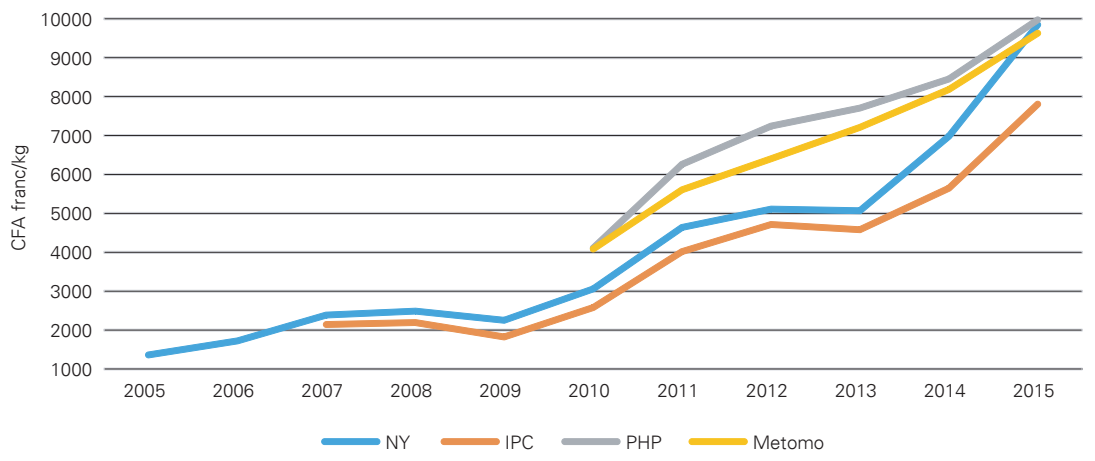
The GRIGPP was set up in 2011 to make the GI application. It was initially made up solely of growers, but since 2012 it has included two new associations, covering nurseries and distributors. This has facilitated coordination of the flow of information and improved the decision-making process.

Since 2012, the role of the GRIGPP has thus been expanded beyond simply defending the interests of its members and monitoring compliance with the specifications. It has been able to start carrying out collective purchases of

19 These figures are the estimates of the International Pepper Community (IPC).

20 Ferrand and François, 2011.

Figure 4: Evolution in the international price of white pepper and selling prices of the two main Penja pepper growers



Source: IPC and data obtained following field surveys

The NY and IPC curves show the evolution of two indicators of the international price of white pepper: the New York spot price and the IPC composite index. These prices were originally quoted in dollars, but have been converted into CFA francs to take changes in the exchange rate into account.

The PHP and Metomo curves show the selling prices recorded in the accounts of the two main growers.

equipment, develop partnerships, play a role in fixing prices and manage loans for fertilizer etc.

In this way, the GRIGPP has concentrated mainly on production in order to guarantee the specific quality of the product, bearing in mind the wide range of techniques used by farmers. Many training sessions have been organized for farmers in order to provide them with the technical knowledge needed for compliance with the specifications.

However, the role of the GRIGPP has developed since 2015. A farmers' association has been created within it, with the same status as the other two associations (of nurseries and distributors) and with the role of carrying out activities specific to the development of production. The GRIGPP thus concentrates on coordinating the value chain (among the upstream, production and downstream stages).

The GRIGPP decision-making committee is composed of 15 people: ten growers, three representatives of the nursery organization, one of the distributors' organization and one of the executive secretariat. The latter is responsible for implementation of decisions taken by the committee and does not belong to any of the three associations.

External and institutional support

The PAMPIG project provided major support, leading to registration of the GI. The application for GI registration was formulated by the GRIGPP and validated in 2013 by the Cameroonian national GI committee, then by OAPI.

Following registration, the state showed great interest and promised support (especially for the supply of drinking water, which is needed for post-harvest processing). The GRIGPP was also able to mobilize other international support (in particular to finance the verification and packaging centre). Various research bodies also provide support (for example in disease control).

Monitoring and guarantee systems

As stated above, it has not yet been possible to get the monitoring and certification system up and running, which means that there is no visible distinction between GI and non-GI Penja pepper. The GRIGPP plans to establish a verification and packaging centre in early 2017, which will make it possible to monitor the quality of the pepper by certifying the GI and placing its logo on standardized packaging.

5. Economic impacts of the GI process

In the context of a fairly unstructured pepper value chain, wholesalers were taking advantage of the situation since farmers did not know the market price of pepper. Thanks to a collective effort on the part of the associations making up the GRIGPP, a minimum annual price is now established by the GRIGPP. Moreover, the entry of more new wholesalers in the value chain made it possible to bring relations between farmers and wholesalers into better balance. The creation of associations of nurseries and distributors and their grouping within the GRIGPP also reduced transaction costs within the sector.

The positive impact of the GI is a result mainly of the spread of cropping and post-harvest practices that are more productive and of better quality. Training sessions have been organized for farmers belonging to the GRIGPP and know-how has then spread out from this. These practices entail higher production costs (approximately an additional 2.5 million CFA francs[21] per year per hectare), but also lead to an improvement in the quality of the final product (and in the selling price) and in yields. The annual profitability of production per hectare can increase about sixfold for farmers who adopted these new techniques in 2015.

The possibility of gaining access to these new techniques and the services offered by the GRIGPP has drawn a growing number of farmers into the GI. The GRIGPP had about 200 members in 2015, as against 10 in 2011. Its members' pepper production rose from 70 tonnes in 2010 to between 200 and 300 tonnes in 2015. This growth will be even greater in coming years, since not all the pepper plants have yet come into production and there is also bound to be a rise in yields.

The spread of technical innovation in a context of rising prices, both internationally and locally, has also prompted a great many local farmers who had not joined the GI to invest in pepper production. The increase in the number of growers is thus striking, not only in Penja but also in neighbouring regions (included in the GI zone), where pepper production was not yet widespread.

The reputation of Penja pepper is thus starting to be established throughout the country and also internationally, with the registration of the GI in 2013 and the ensuing communication strategy boosting this reputation. A French company in particular has put out much information about Penja pepper and its special quality in recent years and has created its own "Poivre de Penja" brand; following registration of the GI, the GRIGPP has sought to get this company to join the GI.

Thanks to this coordination of local stakeholders, the improvement in quality and the steady growth of its reputation, the price of Penja pepper could break free of fluctuations in world prices in coming years. However, this separation has not yet clearly started (see Figure 4), although it can be seen that over the period end-2011 to mid-2014, when the international price fell, prices in Penja remained steadier, to then start rising again when the international price rose. This may reflect a greater resilience of Penja pepper, which may be confirmed in coming years.

In the case of the Penja pepper GI, the economic impacts are detailed in Table 1.

6. Conclusion and future outlook

Dissemination, through the specifications of efficient cropping and post-harvest practices improves the profitability of small-scale plantations in the GI area and beyond.

A detachment from international prices could take place in forthcoming years but has not yet clearly started.

This young, dynamic GI requires the establishment of certain safeguards in order to preserve its identity:

- Governance of the GI is promising, but its long-term stability calls in particular for financial sustainability and capacity-building for its stakeholders.
- If the quality of Penja pepper is to be guaranteed and the risks of misappropriation of the name limited, an effective monitoring and certification system is still needed.
- Environmental issues in the zone could be more fully taken into account in production practices.

21 1 CFA franc = EUR 0.0015.

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Price	Average increase in prices	Prices rose on average by 120%–130% between the periods 1995-2013 and 2013-2015, following the evolution of the international market	Mean comparison test
		Increase in the selling price of dry pepper by PHP between 2009 and 2015: • average price of dry white large-grain pepper: + 185% • average price of dry white small-grain pepper: + 245% • average price of black pepper: + 295% • average price of green pepper: + 222%	Descriptive statistics
		Increase in the selling price by the Metomo plantation between 2009 and 2015: • average price of dry white large-grain pepper: + 242% • average price of dry white small-grain pepper: + 256%	Descriptive statistics
		Increase in average prices of Metomo and PHP plantations between 2010 and 2015 higher than that of white pepper on the international market	Descriptive statistics
Profit	Average increase in profits thanks to adoption of new techniques	Farmers changing from "basic" techniques to new techniques proposed under the GI benefited in 2015 from a gain of about 600%, rising from 1 420 000 to 8 920 000 CFA francs/ha/year	Mean comparison test
Growers	Average increase in the number of growers	Between the periods 1995-2013 and 2013-2015, the number of growers saw an average increase within and outside the PGI zone: • 728% in the Penja district (from 14 to 116 growers) • 746% in the Bouba district (from 15 to 127 growers) • 527% in the Loum district (from 11 to 69 growers) • 800% in the Loum Gare district (from 2 to 18 growers)	Mean comparison test

Source: Authors.

Impacts on the territory

The development of tourism may be seen as an indirect effect of the growing reputation of Penja pepper. Since recognition of the GI, tourist numbers have increased greatly, according to members of the GRIGPP.

Establishment of the GI has also had a ripple effect on the whole pepper sector (both GI and non-GI) in the region and beyond, leading to major technical advances in terms of productivity and quality, an increase in growers' income and a considerable impact on local development.

Penja pepper plant and grain

© Catherine Teyssier

Methodology

Sources

- Survey data (Charbonnier, 2015):
  - Interviews: 50 growers (40 GI, 10 non-GI), 20 GI distributors, nurseries, GRIGPP representatives, public and private partners (development agencies, research centres, government departments), experts (agricultural researchers)
  - Two farmers' focus groups
  - Survey of 974 farmers
  - GRIGPP census dataset (120 GI growers)
  - Major producers' price data (PHP and Plantations Metomo, 2009–2015)
- IPC

Types of analysis

- Diachronic analysis
- Cost structure of the typical GI farm
- Descriptive statistics
- Mean comparison test

Acronyms

AFD	French Development Agency
CIRAD	International Cooperation Centre on Agrarian Research for Development
GRIGPP	Group Representing the Penja Pepper
GI	Geographical Indications
INAO	France's National Institute for Quality and Origin
IPC	International Pepper Community
OAPI	African Intellectual Property Organization
PAMPIG	Support Project for Establishment of
PHP	Plantations du Haut Penja

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Taliouine saffron, Morocco

supporting the development of smallholder farming

The case in a few lines

- This spice is firmly anchored in the local culture and enjoys a considerable reputation on the Moroccan domestic market.
- The variety is found in a very specific mountain zone with a semi-arid to arid climate in the Taliouine and Taznakht communes and is grown with traditional know-how, particular women's, of cultivation of the bulbs and preparation of the stigmas.
- About 1 400 farmers are involved in saffron growing, covering an area of about 850 hectares.
- Taliouine saffron constitutes 95 percent of the national production, and Morocco is the fourth largest producer in the world with a little more than 4 tonnes produced annually.
- The protected designation of origin (PDO) was registered in 2010 in the framework of the 2008 Law on Distinctive Signs of Origin and Quality of the Ministry of Agriculture and Fisheries.
- Development of the PDO and the value chain enjoys much support, especially under the national policy supporting agricultural development, the Green Morocco Plan.

Economic impacts

- Structural organization of the value chain: increase in the numbers of cooperatives and growers involved in cooperatives; between 2010 and 2014, the number of PDO cooperatives increased sevenfold
- Reduction in the quantities sold by growers outside cooperatives and increase in the quantities sold by cooperatives and private enterprises
- Increase in prices paid to growers outside cooperatives and even greater increase in prices paid to growers through cooperatives
- Diversification of markets

Key messages

- The specifications simply take up traditional practices without any additional requirement, which means that all growers are eligible for the PDO.
- The GI process has led to the strengthening of official markets, and thus helped to combat fraud on the informal market through sales via cooperatives rather than direct sales by the grower.
- Development of the PDO was closely associated with the structuring of the value chain through technical support projects (linked to the national policy of developing small farming) and support to capital investment and access to quality standards.
- This recent process, which aims at local development beyond the GI, can be consolidated if public and private efforts are maintained on a long-term footing.

1. Link to the *terroir*

Saffron originated in the Middle East and was introduced into Morocco several centuries ago by Arab traders. The "red gold of Morocco" (one of the most expensive spices in the world) is essential in Moroccan culture, especially in the country's cuisine with its use in various traditional dishes such as tajines, keftas or mrouzia (a mutton- or lamb-based dish), but also in craft work for its colouring properties, and in medicine and cosmetics.

Figure 1: PDO Taliouine saffron production zone

Source: Authors.

Saffron has traditionally been grown in the Souss Massa Drâa (SMD) region, in the commune of Taliouine for at least four centuries, but also in the commune of Taznakht with expansion of its cultivation in the 1960s (see Figure 1). Its reputation was thus founded on the name Taliouine. The soil and climate conditions of these areas are very favourable to the crop: most of the soil is shallow and sandy-silt. The climate is semi-arid to arid, with very cold winters. It is associated with the agropastoral system of the area, and particularly the use of manure from extensive livestock rearing as a technique to improve soil fertility.

Cultivation, harvesting and stigma removing methods represent local know-how that has been handed down through the generations. Picking the flowers and extracting the stigmas in particular require considerable work, which is carried out by women: it takes one hour to pick 1 000 flowers by hand or to extract 500 stigmas, bearing in mind that from 150 000 to 250 000 flowers are needed for one kilogram of dry saffron. The yield can be as high as 10 kilograms per hectare with intensive cultivation and generates an annual income for farmers of more than 35 000 Dirhams (Dh)[22] or about EUR 3 200. However, under traditional cultivation systems, yields are limited to 2 to 3 kilograms per hectare. For 58 percent of the 91 farmers surveyed, saffron contributed more than 50 percent of their income.

Legal and institutional framework

Moroccan Law 25-06 concerning distinctive signs of origin and quality of food, agricultural and fishery products was promulgated in 2008. This *sui generis* regulation envisages two types of protection: the protected geographical indication (PGI) and the protected designation of origin (PDO). The law is part of the Ministry of Agriculture and Fisheries' agricultural development policy, the Green Morocco Plan, one of the main thrusts of which is the promotion of products from small farming.

The Ministry of Agriculture and Fisheries is responsible for recognizing PGIs and PDOs and maintains the register in association with the Moroccan Office of Industrial and Commercial Property.

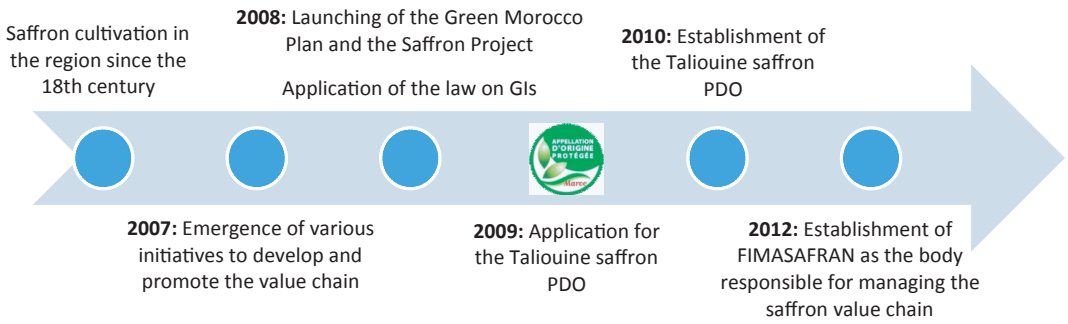
Taliouine saffron is distinguished by a slightly bitter, sharpish taste because of its safranal content, which is much higher than that of most other saffrons: about 50 milligrams per 100 grams as against 15 milligrams for saffron from Iran.

2. History of the GI process

The start of the GI process dates from 2007. An initial identification of potential products was carried out by the local Migrations and Development association with the support of FAO, with a view to promoting and optimizing Taliouine saffron on the market. This process led to technical support from FAO in 2008 to organize the value chain and optimize this mountain product through a geographical indication, in collaboration with the SMD Regional Council and in line with implementation of the law on distinctive signs of origin and quality and the associated decrees. In 2009, the SMD Regional Council filed an

22 1 Dirham = 0.093 EUR, January 2016.

Figure 2: History of the Taliouine saffron value chain



Source: Authors.

Specifications

The Taliouine saffron specifications contain: demarcation of the geographical zone; the historical elements explaining the origin of the product in the area; a description of soil and climate properties and the water resources underlying the link between the quality and features of the saffron and the geographical environment; a description of the chemical and sensory characteristics of the end product; a description of the agricultural practices (crop rotations and combinations, tillage practices, planting methods, irrigation, fertilization, crop maintenance), as well as harvesting, drying and packaging; definition of the certification and monitoring body; elements concerning labelling; and hygiene and quality requirements.

The demarcated area comprises the 13 communes of Taliouine (730 hectares) and the 5 of Taznekht (120 hectares). The stigmas must be extracted in the three days following harvesting in order to retain the quality of the product. Drying of the threads can be carried out in the traditional way, in the sun, in the shade or by dryers. The main new element in the PDO specifications beyond the earlier practices is the formalization of basic hygiene requirements.

This official document refers to the traditional production method, since it is also the most widespread, thus allowing all the growers in the demarcated area to use the PDO.

application for PDO status for Taliouine saffron, and this was granted the following year.

The Green Morocco Plan initiated by the government in 2008 with the aim of stimulating the development of Moroccan agriculture, especially its second component, concerning the optimization of local products, made it possible to provide support to the efforts of the value chain to organize itself and optimize its product, and in particular to create the Moroccan Saffron Interprofessional Federation (FIMASAFRAN) in 2012, which became the body responsible for protecting and managing the PDO.

3. Value chain

The saffron value chain in the Taliouine-Taznakht region has recently been organized and boosted under various projects. In 2015 the various stakeholders formed an association: about 2 300 saffron farmers, 50 cooperatives, 35 of them with PDO certification, 3 economic interest groups (EIGs), middlemen and 2 private enterprises. In general, farmers cultivate small plots (0.2 hectare on average), using traditional techniques, with poor yields. For these small farmers, saffron production represents their earning capacity, while their other products tend to be food or subsistence crops. Private growing and processing enterprises cultivated 19 hectares in 2014, using fairly intensive production techniques and supplementing their supply through contracts with more than 400 farmers.

As far as marketing is concerned, farmers have the choice of selling through middlemen on local informal markets (souks) or to cooperatives, to which more than 80 percent of farmers now belong. The cooperatives can sell on domestic markets, for export or to one of the three existing EIGs, which have the objectives of promotion, quality improvement, marketing and the opening up of markets.

The value chain is still divided between PDO saffron and non-PDO saffron. The latter is still

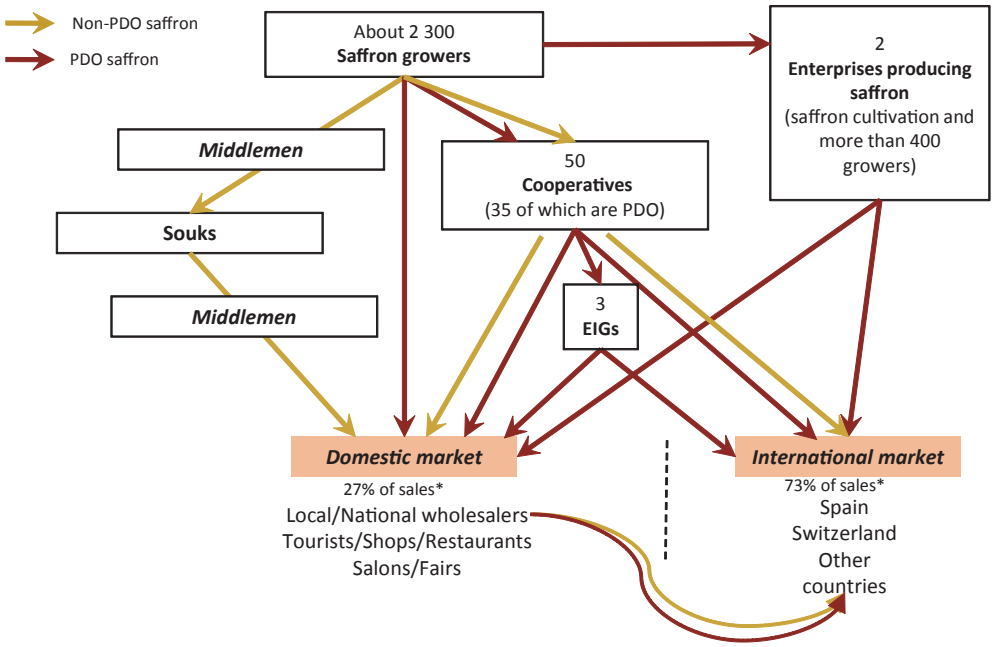
Production and market: some figures

Morocco is the world's fourth largest producer of saffron, with a production of a little more than 4 tonnes in 2013. Iran is by far the largest producer, with 180 to 185 tonnes per year, thus controlling 90 percent of the global market. It is followed by India and Greece, which produce 9 and 6 tonnes per year respectively. Spain is also a key player in the saffron market thanks to its major import/export activity.

Approximately 95 percent of Morocco's saffron is produced in the Taliouine and Taznakht communes (see Figure 1). Export is a major outlet for this spice, although the quantities exported vary considerably from year to year (1 tonne in 2012, 3.2 tonnes in 2013, 0.5 tonne in 2014; these quantities are only those declared to the Moroccan Exchange Office). The main purchasers are Spain (61 percent of the total value of exports between 1998 and 2009) and Switzerland (35 percent).

The Moroccan saffron market is still very informal. For example, it is estimated that in 2009 about 70 percent of the country's production was marketed through parallel channels. The unmonitored market for this high-value product has to contend with many misappropriations of the name and much quality fraud.

Figure 3: Diagram of the Taliouine saffron value chain



Source: 2015 data based on field surveys

marketed through unofficial channels, so that a portion of its production does not appear in national statistics.

4. Governance of the GI

Management of the GI by market stakeholders

FIMASAFRAN encompasses cooperatives, enterprises and farmers. Its aim is to manage the strategy of the PDO and boost the value chain by encouraging production and promoting quality, in order to place Moroccan saffron in a better position on the international market. The Maison du Safran is responsible for organizing marketing, thanks to the Saffron Exchange, which seeks to regulate selling prices.

External and institutional support

Development of the PDO and organization of the value chain have received considerable support from many sides (the NGO Migrations and Development, Slow Food, FAO, the SMD Regional Council) and in particular from the Green Morocco Plan: 1 285 farmers benefited from the Saffron Project of the Green Morocco Plan (2010–2013). The policy of supporting small farmers carried out through the Green Morocco Plan has in particular allowed:

1. for farmers belonging to a cooperative, support for the development of irrigation systems, thus enabling them to improve their yields and reduce their production costs;
2. for cooperatives and EIGs involved in the PDO, subsidies for capital investment and to cover the costs of certification;
3. for cooperatives, financial assistance to create a shop, with a view to stimulating and profiting from the development of tourism.

Apart from direct subsidies, the government has supported organization of the value chain through a contract-programme with FIMASAFRAN for a sum of Dh 100 million to promote the saffron value chain and finance the Maison du Safran. The Maison du Safran also provides a place for sharing experience and training stakeholders in the value chain.

Lastly, the SMD Regional Council provides training to new saffron growers to ensure quality production in compliance with the requirements of the PDO specifications.

Certification

Quality control is carried out in the first instance by the growers themselves, thanks to training provided by the SMD Regional Council, which then monitors the growers once a year. A third control is carried out by Normacert, the accredited certification body, which is responsible for issuing the certificate of compliance. The checks are made once a year, randomly, on all the stages in production and processing, both in the case of the control carried out by the SMD Regional Council and also in that of the one carried out by Normacert. With regard to certification costs, cooperatives and EIGs receive state subsidies, while private enterprises pay a fixed rate of Dh 8 000 (EUR 745) a year for it.

5. Economic impacts of the GI process

In the case of the Taliouine saffron GI, the following economic impacts can be highlighted (Table 1).

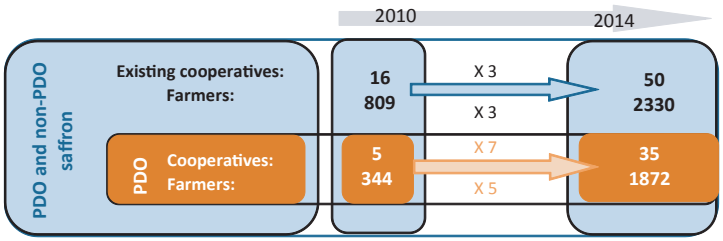
The value chain underwent major reorganization, connected with implementation of the Green Morocco Plan, which has supported the establishment of more cooperatives, as well as organizing an EIG. Between 2010 (the date of adoption of the PDO) and 2014, the number of cooperatives with PDO certification increased sevenfold (from 5 to 35). The Moroccan Government's incentivization policy has also encouraged adoption of the saffron PDO by subsidizing the certification costs. This reorganization of the value chain meant that the vast majority of farmers had recourse to cooperatives for the same volume marketed (the effect of replacing sales of non-PDO saffron by individual farmers with sales of PDO saffron

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Number of PDO cooperatives	Between 2010 and 2014, the number of PDO cooperatives increased sevenfold	From 5 cooperatives in 2010 to 35 cooperatives in 2014	Master's dissertation
PDO volume	Reduction in quantities sold directly by farmers outside cooperatives	- 26% between 2000 and 2014 From 856 kg in 2000 to 631 kg in 2014	Mean comparison test
	Increase in quantities sold by cooperatives and private enterprises	+ 1 075% between 2000 and 2014 From 29 kg in 2000 to 341 kg in 2014	Descriptive statistics
PDO price	Increase in prices paid to farmers outside cooperatives	+ 40% between 2000 and 2014 From about Dh 11 500/kg in 2000 to about Dh 16 000/kg in 2014	
	Increase in prices paid to farmers through cooperatives	+ 500% between 2000 and 2014 From about Dh 3 300/kg in 2000 to about Dh 17 000/kg in 2014	
Diversification of markets	PDO sales in supermarkets in coastal towns (Casablanca, Agadir and Rabat) benefited from a rise of 137% in volume between 2010 and 2014, exports managed by cooperatives and enterprises were boosted, and local shops were created		Master's dissertation

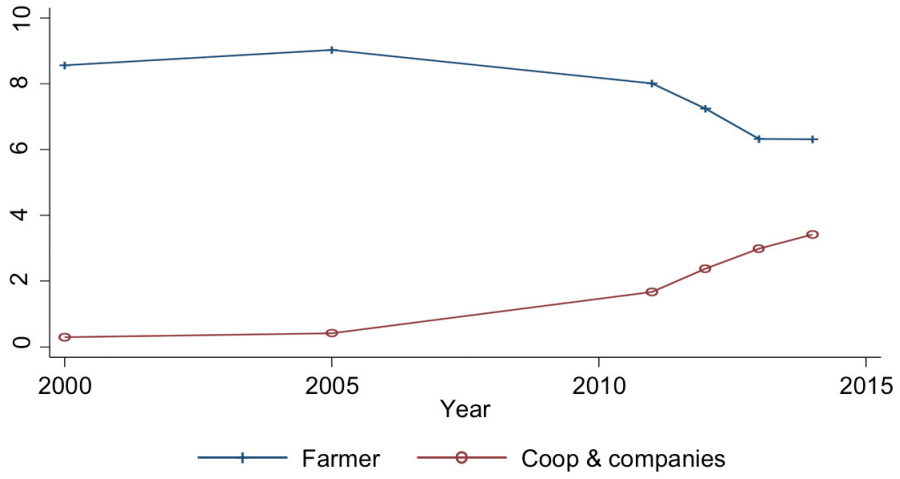
Source: Authors.

Figure 4: Evolution of the structural organization of Taliouine saffron supplies between 2010 and 2014



Source: field surveys 2015

Figure 5: Evolution in the quantities sold by farmers and those sold by cooperatives and companies between 2000 and 2014



Source: field surveys 2015

by cooperatives and enterprises) (see the figure above).

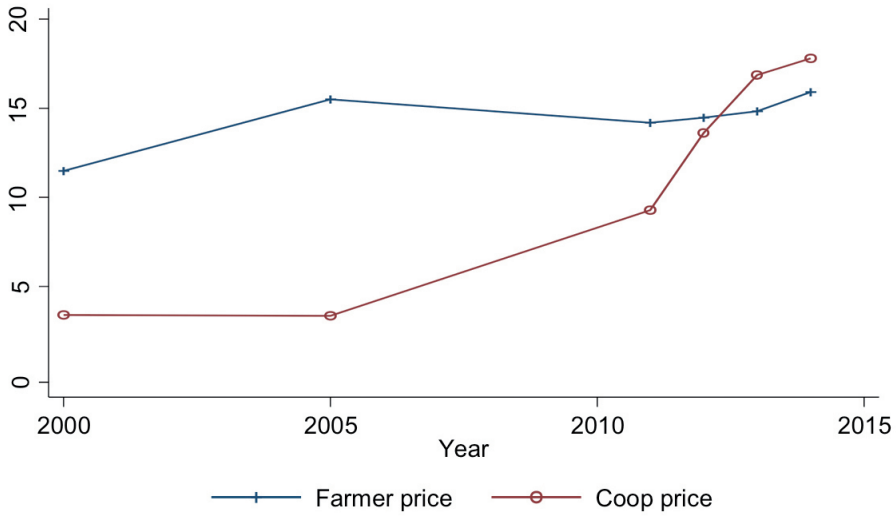
The issue now is to understand how the quantities produced and marketed have evolved. The increase can be explained by three factors: an increase in the area cultivated, better conditions for small farmers thanks to government support for irrigation systems and the intensification of production practices.

So far as the volumes marketed are concerned, comparison of sales of PDO saffron by cooperatives with sales through other channels is interesting. The quantities sold by farmers outside cooperatives decreased by 26 percent between 2000 and 2014, whereas the quantities sold by cooperatives and companies increased by 1 075 percent over the same period. This analysis thus shows that the cooperatives allow the PDO product to be sold better, as compared with sales by individuals.

Prices paid to farmers outside cooperatives increased by 40 percent between 2000 and 2014, rising from about Dh 11 500 per kilogram in 2000 to about Dh 16 000 per kilogram in 2014. Prices paid to farmers through cooperatives increased by 500 percent between 2000 and 2014, rising from about Dh 3 300 per kilogram in 2000 to about Dh 17 000 per kilogram in 2014. The establishment of cooperatives has thus had a positive price effect for all farmers, but a considerably greater one for those belonging to the cooperatives.

The last impact observed during field surveys concerns the diversification of official markets. PDO sales in supermarkets in coastal towns (Casablanca, Agadir and Rabat) enjoyed a rise of 137 percent in volume between 2010 and 2014,

Figure 6: Evolution of price paid to farmers and that paid to cooperatives between 2000 and 2014



Source: field surveys 2015

Impacts on the territory

The effect of replacing individual sales with sales through cooperatives provides the formal market with a structure, inasmuch as sales by cooperatives and with PDO certification strengthen the formal sector and make it more transparent. This gives the state more control and allows it to benefit from taxes on sales of the product through official channels. The PDO is thus one of the tools that progressively allow the suppression of counterfeiting, boost the reputation and organize the value chain by stabilizing operators' incomes.

Another indirect effect that can be highlighted concerns the development of tourism. The creation of an annual saffron festival[23] was one of the major actions to promote Taliouine PDO saffron in the region. This has also led to the development of another activity: the creation of shops aimed at tourists, leading in turn to an increase in local sales.

Revitalization of the area has also been supported by various training projects set up for farmers on a range of technical subjects.

exports managed by cooperatives and companies were boosted and local shops were established.

6. Conclusion and future outlook

The example of Taliouine saffron illustrates a GI process seeking to optimize a renowned traditional product as a lever for structuring a value chain and developing an economically marginalized rural zone. In such a situation, the GI process not only has to put in place the elements needed for development of the GI (formulation of specifications, organization of certification, GI promotion strategy), but also has to overcome a number of obstacles to development, such as the lack of organizational and technical skills among stakeholders in the value chain, especially small farmers and cooperatives, the lack of resources and of access (physical and organizational) to formal markets, and the difficulty of applying quality standards.

Despite these conditions and the recent nature of registration of the PDO, as well as the lack of official data, a certain number of economic impacts can be observed, particularly the increase in the price paid to farmers both as individuals and as members of cooperatives.

This case illustrates a process strongly supported by those involved in development and government policy. Government policy, in which the PDO has a special place, has a direct effect on the impacts of the GI process through a set of measures to develop saffron production and the PDO. The effect of the fact that subsidies for

23 https://terriermichel.wordpress.com/2012/12/03/sixieme-edition-du-festival-du-safran-taliouine-a-celebre-lepice-la-plus-chere-au-monde/

Taliouine saffron harvest at dawn

© Emilie Vandecandelaere

certification are conditional on their being paid through cooperatives or EIGs may be questioned with respect to the long-term sustainability of the GI process. Would farmers pursue PDO certification if it were not subsidized? Would the cooperatives continue to exist?

Although this major external government support is passed on through local players, particularly the Migrations and Development association, it makes the whole process somewhat top-down, at least at the start, whereas a bottom-up approach is essential for sustainability. However, when certain local capacities are absent at the start of the process (lack of information, knowledge and technical and organizational skills, illiteracy etc.), external support is necessary and useful, so long as it is temporary. Sustainability then depends on making sure of the progressive assumption of ownership by local stakeholders and their steady empowerment, with appropriate strengthening of their capacities.

This is why it seems wise for the main objective to be to strengthen governance of the value chain, with greater involvement of small farmers in decisions concerning management of the Taliouine saffron PDO. If it is to be maintained, it is vital to encourage farmers and cooperatives to stand on their own feet so that they can continue their activities if ever government subsidies should disappear.

In addition, if Taliouine saffron is to be fully optimized, it is important to continue the development of formal marketing channels. This will facilitate the suppression of fraud, maintain and even increase the reputation of Taliouine saffron and ensure that it is well placed on the market at a price commensurate with its value, while ensuring that the benefits are distributed equitably along the value chain. Social improvements could in particular be envisaged, especially concerning the working conditions of women, who play a central role in saffron production.

Methodology

Sources

- Field survey data (Mutarambirwa, 2015):
  - 91 farmers, 26 cooperatives, the 2 companies and the 3 consortia
  - In Taliouine: 6 local buyers in the souk and 3 local retailers were interviewed
  - In other towns: 1 cooperative, 20 supermarkets and 8 retailers in spice shops or souks
- Moroccan Export Bureau

Analyses of data

- Analysis of production costs using the Typical Farm model
- Descriptive statistics
- Diachronic analysis
- Mean comparison test

Acronyms

EIG	economic interest group
GI	geographical indication
FIMASAFRAN	Moroccan Interprofessional Saffron Federation
PDO	protected designation of origin
PGI	protected geographical indication
SMD	Souss Massa Drâa

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Tête de Moine cheese, Switzerland

revitalizing a traditional value chain

The case in a few lines

- A semi-hard Swiss cheese using unpasteurized cow's milk, with seasonal production (end-of-year festivities).
- Cheese from an ancient tradition (1190) produced in a mountainous region (800 to 1 250 metres).
- About 2 200 tonnes produced each year by 270 producers, representing 1.2 percent of Swiss cheese production, in an area of 900 square kilometres.
- Technical innovation (1981) with the use of the (a device that makes it possible to make rosettes of cheese by turning a scraper on an axle planted in the center of the cheese), which provided a major boost to consumption, initially within the country, but then for export, making up a little more than 60 percent of the market today (France, Germany).
- Trade association created in 1997 to promote the cheese and defend the interests of stakeholders in the value chain.
- The Swiss controlled appellation of origin (AOC) registered in Switzerland in 2001 to boost promotion of the cheese, mainly internationally, and recognized as Protected Designation of Origin (PDO) in the European Union (EU) and Russia in 2011.
- Government support for the value chain within the framework of the national agricultural policy.

Economic impacts

- Increase in volumes produced and in exports
- Regular increase in the price of the cheese
- Slight drop in the price of Tête de Moine milk, although it is still higher than that of milk used to make other cheeses and the average price of milk in Switzerland
- The value chain with the highest value creation in the country

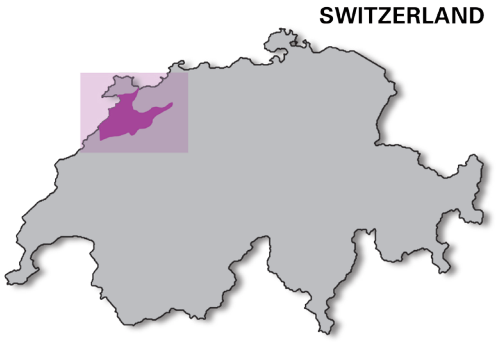
Key messages

- Refinement of a technical innovation, the *girolle*, at the start of the 1980s, combined with the specifications, has revitalized the Tête de Moine value chain, especially for export.
- Consumption is clearly seasonal (the product is consumed especially in the winter, more specifically during the end-of-year festivities), and the small quantities produced set Tête de Moine cheese in a niche market, where it sells for a high price. In economic terms, this seasonality is made possible by a diversification in the cheese dairies' activities, which thus remain profitable throughout the year.
- Development of the international market ensures a major demand that is more profitable, but it does increase risks, given the exchange rate and the seasonal nature of demand.
- The role of the trade association is very strong and provides a structure. For example, a significant drop in prices affected the Tête de Moine market in 2015, and the action of the trade association with regard to management of the volumes produced and the visibility of the PDO contributed greatly to resilience and to stability of value creation.

1. Link to the *terroir*

Tête de Moine cheese has been in existence for centuries. The earliest mention of its existence dates back to about 1190, when monks from the Bellelay monastery used their cheese as currency. However, the Tête de Moine designation appeared only in the 1790s. It is a seasonally produced cheese, with consumption peaking around the end-of-year festivities. It is a semi-hard cheese made with unpasteurized cow's milk, and has a taste that varies according to its maturation (minimum 2.5 months and maximum 4 months).

Figure 1: Tête de Moine cheese production zone



Source: Authors.

The special nature of the cheese is partly a result of the fact that it is not cut, but pared, as the monks traditionally did. In 1981, an innovation was designed and patented, the (see Figure 2), with which the cheese can be shaved to form the distinctive rosettes.

The production zone is very small (900 square kilometres; see Figure 1) and the altitude ranges from 800 to 1 250 metres, with very uniform soil and climate conditions. The Tête de Moine PDO production zone lies within the Gruyère PDO production zone, which is much larger. The milk production specifications are the same for the two PDO cheeses, which coexist in synergy in the Tête de Moine zone, mutually reinforcing their resilience and competitiveness.

2. History of the GI process

In 1978, cheese makers producing Tête de Moine formed the Association of Tête de Moine Makers in order to promote the cheese and stimulate cheese production in the region. Then, linked to the invention of the in 1981, the traditional cheese recipe was altered to adapt it to the device. This local cheese then became a high-end cheese and the value chain underwent major expansion nationally, doubling production in less than five years. The law on GIs was approved in Switzerland in 1997 and the Tête de Moine Trade Association was established. The association obtained national registration of the AOC in 2001. Promotion of the cheese, mainly internationally, was one of the main reasons for this step. Lastly, in 2002, the Association of Tête de Moine Milk Producers was created in order to protect the interests of dairy farmers and support the work of the trade association.

Legal and institutional framework

In Switzerland, geographical indications (GIs) are protected under the approach following the Decree on Protected Designations of Origin (PDOs) and Protected Geographical Indications (PGIs) of 28 May 1997 (RS 910.12). The Federal Office for Agriculture is responsible for registering agricultural and food products (excluding wines) under the PDO or PGI systems and for keeping the register of registered GIs and for monitoring the certification body. The Swiss PDO-PGI Association is the body holding the PDO and PGI labels and supplying them to registered value chains.

In 2011, following bilateral agreements between Switzerland and the European Union on the one hand, and between Switzerland and Russia on the other, the CDO was recognized in Europe and the PDO in Russia.

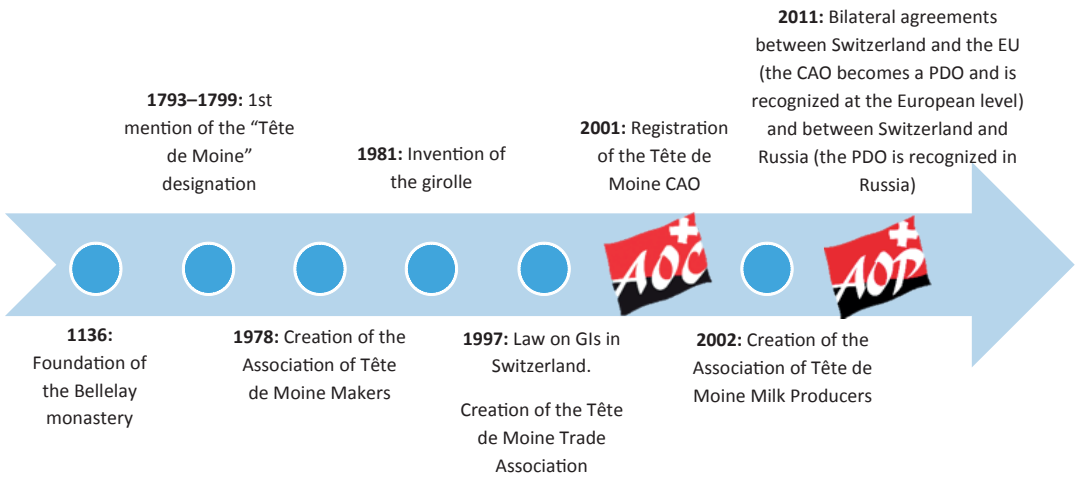
The application for PDO or PGI recognition can be made only by groups of producers and/or processors and/or makers of the product. Certification is obligatory and is carried out by a third-party accredited body. A unique logo is envisaged for the PDO and another for the PGI. In 2016, Switzerland had 33 products with PGI recognition, 12 of which are cheeses.

3. Value chain

The Tête de Moine value chain comprises about 270 dairy farmers, 9 cheese makers and 2 ripeners (see Figure 3). One farmer processes his own milk into Tête de Moine cheese.

The farmers in the Tête de Moine value chain vary depending on their different rearing systems (ranging from a biological system to a more intensive system). However, in general, the size of farms ranges from 15 to 40 hectares, with 20 to 65 cows of the Red Holstein and Montbéliarde

Figure 2: History of the development of the Tête de Moine GI



Source: Authors.

Specifications

The specifications for the Tête de Moine PDO contain: demarcation of the geographical area (90 000 hectares in northwestern Switzerland) where the milk must be produced and the cheese processed; a description of the product and how it is obtained (conditions of livestock rearing to produce the milk and cheese); testing of the final product (quality control and sales formats); labelling; and certification.

With regard to livestock rearing, the specifications describe in particular the cows' food: at least 120 days at pasture; fodder must come from the demarcated area and represent an average 70 percent of the animals' diet; and the use of silage, products containing urea, bone meal, growth hormones or any other similar product is strictly forbidden. The procedures to be used for making and ageing the cheese, for example processing in copper vats and ripening on spruce planks, are also specified.

With regard to marketing, the cheese may be sold in whole wheels or half wheels, or as rosettes placed in punnets.

breeds, producing between 7 500 and 9 000 litres of milk per cow per year. The milk production of about 35 percent of the farms in the zone goes to make Tête de Moine cheese, while the rest of the farms focus on industrial milk production and cattle and horse breeding. Milk production is the highest performing agricultural activity of the farms in the value chain and the least dependent on subsidies compared to other activities in the region.

Eight cheese makers produce various types of cheese, while one maker produces only Tête de Moine and processes about 40 percent of the milk in the value chain. This diversification allows them to compensate for the seasonal nature of Tête de Moine production. It is also thanks to this environment and the existence of other cheeses that this seasonal value chain can continue to exist with its very high added value.

Cheese makers age a portion of their production for direct sale, but the two ripeners age most of the cheese and sell it to supermarkets and for export.

4. Governance of the GI

Management of the GI by market stakeholders

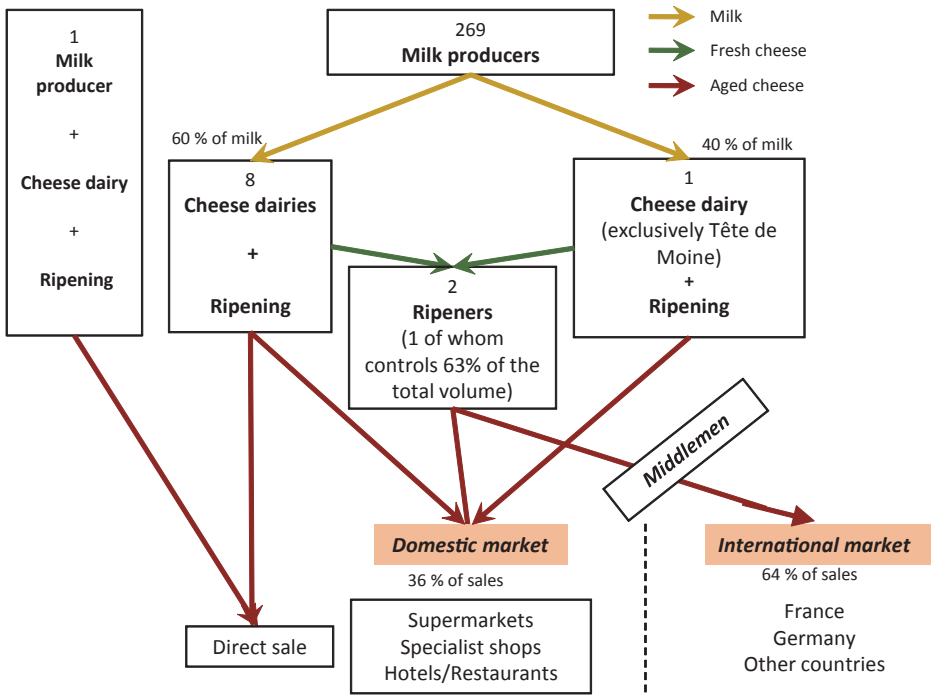
The Tête de Moine Trade Association, which covers milk producers, cheese makers and ripeners, was created in 1997 to be the protection and management body for the Tête de Moine PDO. It made the application for the PDO. It combats fraud and carries out promotion through joint publicity actions, many demonstrations in shops and the organization of special events. Its main objective is to ensure that the value chain is competitive, while stabilizing the income of its members. The trade association also manages production volumes, based on the Swiss ruling on producers' groups and trade associations, giving the latter power over conditions that have been decided collectively with regard to quality, and also with regard to volumes in the case of crisis. The trade association manages volumes thanks to its

Production and markets: some key figures

The cheese sector in Switzerland uses a third of the country's milk production, or a little more than 1.5 million tonnes of milk, to produce about 180 000 tonnes of cheese a year. Tête de Moine production has seen a major expansion, rising from about 200 tonnes at the start of the 1980s to about 2 200 tonnes since 2007, corresponding to 1.22 percent of the country's current cheese production (and less than 1 percent of total milk production).

With the invention of the at the start of the 1980s, national consumption increased almost fourfold between 1980 and the start of the 1990s, while exports also grew, now accounting for more than 60 percent of sales. The German and French markets are the main outlets for this cheese. Consumption is clearly seasonal (the cheese is consumed mainly in the winter, especially during the end-of-year festivities), and the small quantities produced set Tête de Moine cheese in a niche market where it sells for a high price, around EUR 22 per kilogram in Switzerland, EUR 24 in France and close on EUR 50 in some shops outside Europe.

Figure 3: Diagram of the Tête de Moine cheese value chain



Source: 2015 data based on field surveys

monopoly on the issuing of the casein tabs that are used as exclusive traceability markers.

The trade association has two main allies: the Association of Tête de Moine Makers, which brings cheese dairies together and seeks to promote the making of the cheese, improve its quality, increase its reputation and defend the PDO; and the Association of Tête de Moine Milk Producers, which monitors quantities and prices paid to dairy farmers, in collaboration with dairy federations. It also ensures that dairy farmers in the value chain have access to information on quantities and prices.

External and institutional support

With regard to institutional support of the PDO, the trade association receives significant support for all its promotional activities. This government support varies from year to year, inasmuch as it reimburses 50 percent of promotional expenses at the end of the year.

The Swiss PDO-PGI Association was created in 1999 with the purpose of providing producers with the PDO/PGI logo and also defending the interests of value chains, bringing together the stakeholders involved with GIs and promoting the concept of PDOs or PGIs with consumers. It is financed by GI value chains, passive

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Production	Increase in the volume of cheese produced	+ 300% between 1986 and 2014 From 565 tonnes in 1986 to more than 2 262 tonnes in 2014	Mean comparison test
	Increase in exports	+ 2 427% between 1986 and 2014 From 55 tonnes in 1986 to 1 390 tonnes in 2014	Mea4 comparison test
Price	Lower decrease in the price of Tête de Moine milk	- 0.43% on average per year between 1999 and 2014	Descriptive statistics
		- 27% after adoption of the AOC (2001) EUR 89/100 kg prior to the AOC and EUR 65/100 kg after the AOC	Mean comparison test
		The average milk price is EUR 0.71 per kilogram for Tête de Moine milk, EUR 0.67 per kilogram for standard milk and EUR 0.65 per kilogram for Tilsiter milk, between 1999 and 2014	Descriptive statistics
	Increase in the price of Tête de Moine cheese in the EU	+ 57% between 1999 and 2014 From about EUR 15/kg in 1999 to about EUR 24/kg in 2014	Descriptive statistics
	Maintenance of the wholesale price of Tête de Moine cheese	EUR 14/kg between 1999 and 2014	Descriptive statistics
	Steady increase in the price of Tête de Moine cheese on the domestic market	Steady increase: • + 4% between 2001 and 2004: from about EUR 20/kg in 2001 to about EUR 21/kg in 2004 • + 5.13% between 2004 and 2014: from about EUR 21/kg in 2004 to about EUR 24/kg in 2014	Descriptive statistics

Source: Authors.

members who support the activity and the Swiss Confederation.

Lastly, it should be noted that Switzerland's agricultural policy has always supported cheese production in a general way. Since 1992, border protection has diminished considerably, to the benefit of payment for ecosystemic services. At present, a direct payment is anticipated for all milk producers who process their milk into cheese: CHF 0.15 or EUR 0.14[24] per litre of milk. Added to that is 3 cents per kilogram of milk for cheese made from non-silage milk. These subsidies compensate for the high cost of living in Switzerland and help improve the sales potential by lowering production costs.

Monitoring and guarantee systems

Third-party certification is carried out by the Intercantonal Certification Body, which is accredited by the Federal Office of Metrology and Accreditation. Monitoring consists of regular inspections of production sites in order to validate production procedures, and spot checks at least every two years. In addition, physical, chemical and sensory analyses of the product are carried out. In the case of companies, their accounts are to be audited to verify their good management.

5. Impacts of the GI process

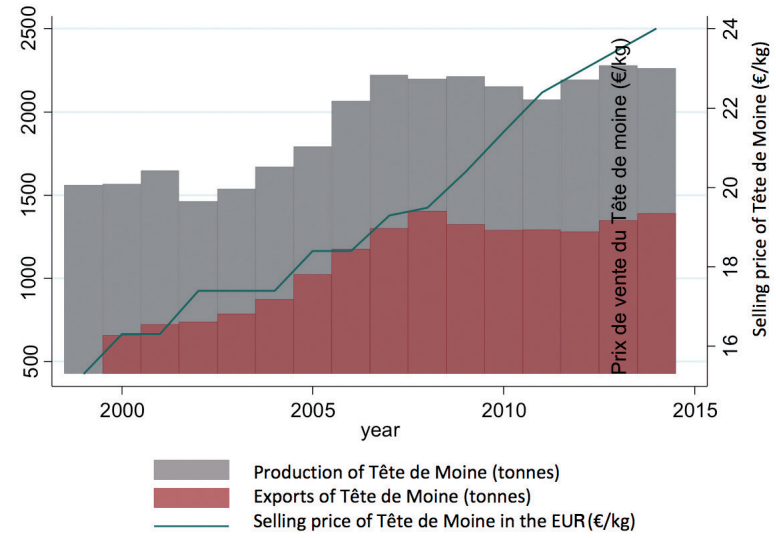
In the case of Tête de Moine cheese, the following economic impacts can be highlighted (Table 1).

The value chain has been growing since the creation of the in 1981. Cheese production has increased considerably, rising from 565 tonnes in 1986 to 2 262 tonnes in 2014. A rapid upsurge in volumes was seen in the years following establishment of the AOC in 2001: from a little over 1 400 tonnes in 2002 to more than 2 000 tonnes in 2006.

This increase is due to the doubling of exports in the same period, stabilizing at about 1 400 tonnes in 2014. In addition, the rise in

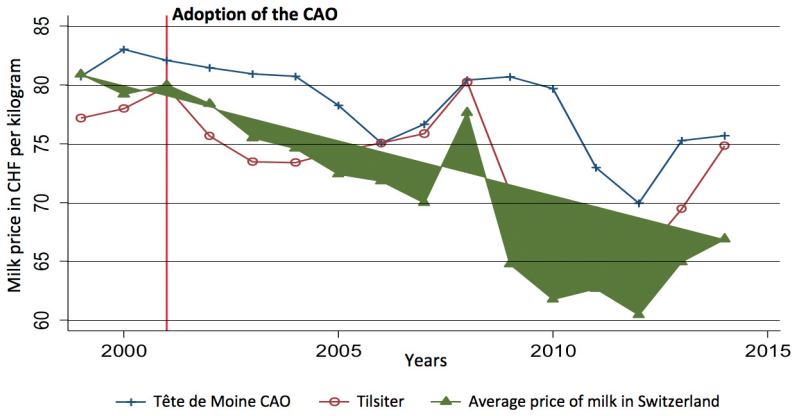
24 CHF 1 = EUR 0.93, March 2017.

Figure 4: Production, exports and prices of Tête de Moine cheese between 1999 and 2014



Source: Tête de Moine Trade Association

Figure 5: Milk prices between 1999 and 2014



Source: Tête de Moine Trade Association

exports has been accompanied by a rise in selling prices in the European Union: about EUR 17 per kilogram in 2002, EUR 19 in 2007 and EUR 24 in 2014 (see Figure 4).

Development of the international market guarantees a large and better paying demand, but also increases the risk, given the exchange rate and the seasonal nature of demand. A notable fall in prices affected the Tête de Moine market in 2015, but the action of the trade association concerning the management of volumes produced and the visibility of the PDO made a major contribution to the resilience and stability of value creation. In addition, the government strongly supported producers' income and their capacity for investment.

Prices in the Swiss milk market have shown a downward trend since the suppression of dairy quotas in 1992. However, the price of milk for Tête de Moine cheese is still one of the highest in Switzerland at about CHF 0.75, or EUR 0.70, per litre (including subsidies). This price is higher by about 10 cents per kilogram than the price paid for milk used to make other cheeses in the region. It allows significant production costs to be covered and confirms the high added value of Tête de Moine cheese.

With regard to the distribution of added value, milk producers receive a price considerably higher than

Tête de Moine cheese processing

© Magnan Axel

Impacts on the territory

Job creation in the region can be cited as an important indirect result of development of the value chain. About 270 steady jobs are directly linked to production. Indirect jobs, both upstream and downstream, have also been created following agricultural development of the region (work in dairies and ripening centres) and tourist development.

Tourism has in fact seen considerable development. It is linked to the traditional landscapes of mountain pastures, landscapes that are preserved thanks to the work of the farmers who maintain them while generating an economic activity. Dairy herd traditions and relatively small farms are maintained, extensive production is promoted and the regional identity reinforced.

producers in the same region who do not supply their milk for Tête de Moine cheese. The average milk prices show a positive effect of the GI process: they are EUR 0.71 per kilogram for Tête de Moine milk, EUR 0.67 per kilogram for standard milk and EUR 0.65 per kilogram for Tilsiter milk.

6. Conclusion and future outlook

The Tête de Moine PDO is based on a solid, long-established reputation. It occupies a seasonal niche market thanks especially to the diversification of dairies that produce other types of cheese for the rest of the year, much of it aimed at export markets.

Several factors may explain this dynamic:

- the invention of the combined with the GI specifications to offer a service to consumers in a niche market;
- large-scale promotion undertaken by the trade association, which spends about ten times more than French trade associations producing equivalent volumes of PDO cheeses (Magnan, 2015); this promotional activity by the trade association also benefits from synergies with other trade associations through concerted action to promote all Swiss cheeses;
- a structuring of the value chain facilitated by the GI process, through protection of the name and efforts to combat its misappropriation, consolidating an upturn in exports (since 2001); the trade association's management capacity, which is well supported by the legal basis concerning producers' groups and trade associations, gives it the necessary legitimacy.

Methodology

Sources

- Survey data (Magna, 2015):
  - Interviews: 2 ripeners, 9 processors, 14 cheese milk producers, 11 industrial milk producers, 14 cattle breeders and 7 horse breeders
  - The trade association and several local agricultural experts were also interviewed
- the Federal Office of Agriculture
- AGRIDEA, the Swiss Centre for Agricultural Advisory and Extension Services
- the Swiss Milk Producers Union

Types of analysis

- modelling of a theoretical average farm
- synchronic evaluation
- diachronic evaluation
- descriptive statistics
- mean comparison test

Acronyms

AGRIDEA	Swiss Centre for Agricultural Advisory and Extension Services
AOC	controlled appellation of origin
PDO	protected designation of origin
GI	geographical indication
PGI	protected geographical origin

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Vale dos Vinhedos wine, Brazil

achieving improved international competitiveness

The case in a few lines

- A quality wine produced in the Vale dos Vinhedos region in the south of Brazil, historically a wine-producing region, linked to major Italian immigration since 1875.
- Evolution of the sign of quality: Vale dos Vinhedos wine was registered as a protected geographical indication (PGI) in 2002, after which the specifications were developed and a protected designation of origin (PDO) was obtained in 2012, with the introduction of new techniques, which have so far been adopted by only a few vineyards.
- 19 wineries in the valley (out of 26) were involved in the PGI process, with an average annual production of 15 000 hectolitres or about 20 percent of the valley's wine production. Nine wineries are involved in the PDO today. The average annual production of Vale dos Vinhedos PDO wines between 2009 and 2014 was 1 900 hectolitres, or about 1 percent of the valley's production, with considerable variations from year to year. More than 90 percent is destined for the domestic market, with about 15 percent being marketed by direct sales, thanks to the considerable tourist activity.
- The Vale dos Vinhedos Wine Producers' Association (APROVALE), covering 22 wineries in the valley and people linked to tourism, plays a major role in promotion of the product by developing tourism.

Economic impacts

- Average increase in PDO wine prices
- Average increase in the production of the variety of grape and the American/hybrid variety
- Average decrease in the volume certified under the PDO as compared with the volume certified under the PGI
- Average increase in production costs following establishment of the PDO specifications
- Increase in the net profit for PDO wine
- Average increase in the income of wineries under the PGI and then the PDO

Key messages

- The PGI was instituted as a response to Argentinean and Chilean competition.
- PDO wines are now placed on the domestic market as niche products.
- The PGI and PDO processes depend on a collective desire to promote the area and are very strongly linked to tourist development: the number of visitors to the valley has grown steadily since the PGI was put in place.
- APROVALE enjoys significant public support. Generally speaking, public support is important in defining strategic guidelines.
- Technical innovations introduced as part of the PDO process have benefited non-PDO vineyards and wineries within the valley and beyond.
- The reputation of the wine and the valley has encouraged the creation of new vineyards and wineries.
- The words "Vale dos Vinhedos" are increasingly being found on non-PDO bottles. They are frequently used by producers of uncertified local wines who hope to take advantage of the promotional value of this device.

1. Link to the *terroir*

The small region of the Vale dos Vinhedos, covering 72 square kilometres, lies in the Serra Gaucha in the south of Brazil (see Figure 1). It is one of the most traditional wine-producing regions of the country. It contains hills with altitudes of between 200 and 700 metres and has a warm, humid climate and mineral-rich soils.

Figure 1: Vale dos Vinhedos wine production zone

Source: Authors.

American grape varieties () were introduced into southern Brazil in the 1840s, but wine production really took off with Italian colonization, starting in 1875. The immigrants brought their know-how and wine tradition, as well as vines. However, the variety did not adapt easily to the conditions in the region, so that hybrid and American varieties became the basis for development of wine production, which focused on table wines.

There was a fresh attempt in the 1920s to introduce the variety, this time on the basis of French vines. The results were better, but it would be another 50 years before the variety spread throughout the area. Thus the 1970s saw the start of the production of quality wine in Brazil. This production fairly quickly achieved some success in the Vale dos Vinhedos, even attracting the interest of foreign investors, enabling the value chain to be modernized.

During the 2000s, production techniques based on sensory quality were developed. In particular, some producers replaced the *trellis* system, used by most vineyards in the region, with the espalier system based on the model of large high-quality vineyards. Growers still using the trellis system sell their grapes in bulk to large-scale operators or process them into table wine themselves. Vineyards in the region that have adopted the espalier system have done so with a view to producing quality wine, installing their own wine-making cellars at the same time.

2. History of the GI process

The production of quality Brazilian wine has enjoyed a certain success since the 1970s. However, the opening up of markets with the creation of Mercosul in 1991 resulted in some instability in the market. The advent of excellent quality and competitively priced Argentinean and Chilean wines led to a crisis and motivated six vineyards in the region to get together in 1995 and create the Vale dos Vinhedos Wine Producers Association (APROVALE), with the aim of countering this new competition. Cooperation with the tourist sector quickly led to the expansion of local wine tourism and direct sales of wine.

Legal and institutional framework

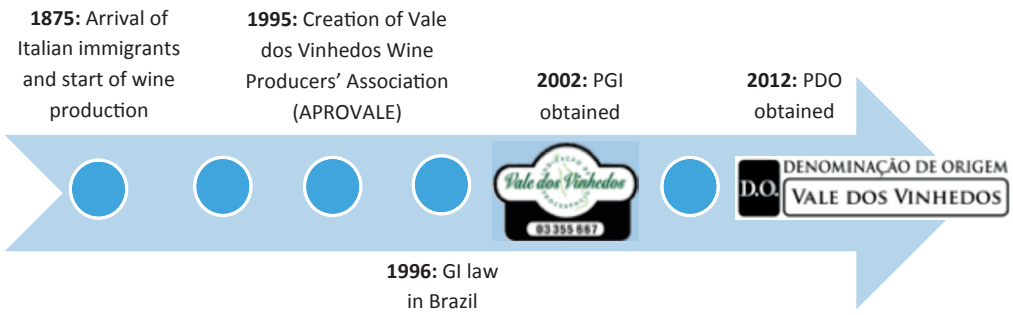
In Brazil, GIs are protected by the approach of law no. 9279 of 1996, which covers agricultural and food products (including wines), crafts and services. The application can come from an association of producers, institutions or entrepreneurs. Certification is carried out by a regulatory council, which must exist at the time the GI application is made.

The body responsible for managing the GI is the National Institute of Industrial Property, under the control of the Ministry of Industry, Foreign Trade and Services. Norm no. 25/2013 sets out the conditions for GI registration.

The Ministry of Agriculture, Livestock and Supplies provides technical support for the appraisal of applications for registration of agricultural and food products, while EMBRAPA provides technical support throughout the development of the GI. The Brazilian Micro and Small Business Support Service supports producers regarding organization and management.

One year later, in 1996, the law on GIs was passed in Brazil and APROVALE then saw GIs as an opportunity to optimize the value of regional wine. With the support of the Brazilian Agricultural Research Corporation (EMBRAPA, falling under the Ministry of Agriculture, Livestock

Figure 2: History of the Vale dos Vinhedos wine value chain



Source: Authors.

Specifications

Specifications for the PGI and PDO were drawn up by the producers, with technical support from EMBRAPA. Both contain: demarcation of the geographical area; authorized varieties; vine cultivation and wine-making standards; characteristics of the final product; labelling standards; role of the regulatory committee; rights and duties of members; and penalties. The PDO specifications lay down the period of transition from the PGI.

The PGI specifications demarcated an area of 81.23 square kilometres, in which 85 percent of the grapes must come from the area, and authorized 21 varieties, with a system of leading the vines along trellises or some other system ensuring the quality of the grapes. They defined seven types of wine: dry red, dry white, dry rosé, light, natural sparkling, Muscatel sparkling and liqueur.

For the PDO, new production techniques were introduced in order to develop a wine with superior sensory qualities. The main modifications concerned the obligatory training of vines in an espalier system. They also restricted the harvest to 12 tonnes of grapes per hectare and 4 kilograms per vine, and reduced the area of the production zone to 74.45 square kilometres. Furthermore, only three types of wine were authorized: red, white and sparkling. The number of authorized varieties was reduced to seven: Merlot, Cabernet Sauvignon, Cabernet Franc, Tannat, Pinot Noir, Chardonnay and Riesling Italico. In addition, the specifications favour two varieties, Merlot and Chardonnay, stating that red wines should contain at least 60 percent Merlot and white wines should contain at least 60 percent Chardonnay. If labels specifically mention these varieties, the percentage rises to 85 percent.

and Supplies) and two universities in the region, this association prepared an application for a PGI. The application was approved in 2002, making Vale dos Vinhedos wine the first Brazilian PGI. This certification boosted the reputation of the wine and the region, attracting more tourists. Five years later, APROVALE initiated a request for recognition by the European Union's Wine Management Committee.

Some years later, APROVALE, with the encouragement and support of EMBRAPA, applied for a PDO in Brazil. This sign of quality requires stricter specifications but is considered to indicate superior quality. The aim of the producers is to position themselves in the same markets as Argentinean and Chilean wines. To this end, important changes were incorporated into the specifications regarding grape varieties and cultivation and wine-making techniques. APROVALE obtained PDO registration in 2012 and its members collectively decided to stop using the PGI. Nevertheless, the name Vale dos Vinhedos is still affixed to wines that are not PDO certified but are produced in the production zone.

3. Value chain

The Vale dos Vinhedos PGI value chain encompassed 19 wineries (out of 26 in the valley), producing especially quality wines, with production from the valley but also from neighbouring areas, and varying volumes with PGI certification depending on the year. The number of wineries using a certificate of origin fell to nine following establishment of the PDO (see Figure 3).

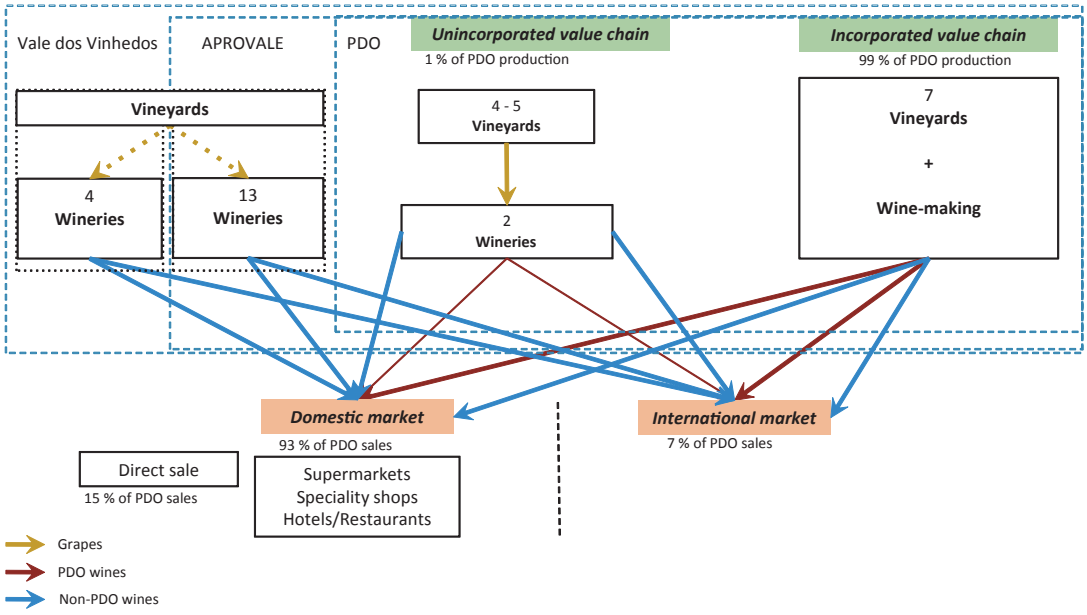
Of the nine wineries participating in the PDO scheme, seven process only grapes coming from their own vineyards. The other two fill out their production by purchasing grapes from other vineyards in the zone.

Production and market: some figures

Brazilian production of the variety of grape (used for wine) is about 75 000 tonnes, which gives an annual production of about 400 000 hectolitres of quality wine. The vast majority is produced in southern Brazil. The domestic market is the main consumer of these quality wines, absorbing a little more than 90 percent of production.

With an average production of about 15 000 hectolitres a year until 2009, wines under the Vale dos Vinhedos PGI represented on average a little over 20 percent of the production of the valley. Vale dos Vinhedos PDO wines today represent only 1 percent of the valley's production, or about 1 900 hectolitres a year on average, with considerable variations from year to year. This microproduction, which constitutes only 0.45 percent of Brazil's total quality wine production, is sold mainly (about 93 percent of production) on a high added value niche domestic market by specialized retailers, restaurants and some supermarkets. About 15 percent of the total volume produced is marketed through direct sales, representing the total sales for some establishments and only a small part (about 8 percent) for others. Exports account for 7 percent of the volume produced and are in the hands of three wineries.

Figure 3: Diagram of the Vale dos Vinhedos wine value chain (PDO and non-PDO)



Source: 2015 data based on field surveys

These wineries vary greatly. The smallest have a production capacity of only about 150 hectolitres of wine a year, while the largest have an annual volume a hundred times greater. Two wineries have implemented specific marketing strategies that have allowed them to expand their activities considerably (one by developing its market in other states in the country and the other by investing in rural tourism with restaurants, hotels and various activities especially connected with food and agriculture). Others have invested in arable land outside the region of the valley, where it was cheaper and more suited to intensive grape growing.

Since the valley is a tourist destination, all the wineries make direct sales and profit from the tourist trade, including wineries producing wine from grapes from other regions.

4. Governance of the GI

Management of the GI on the market

APROVALE was initially set up by six small wineries in 1995 with the aim of developing the value chain and promoting tourism, and subsequently became the lynchpin of the GI processes. In 2015 its members included 22 of the 26 wineries producing quality wine in the region together with 43 enterprises connected

Vale dos Vinhedos grape harvesting

© Giovanna Michelotto

with tourism, such as restaurants, hotels and shops, referred to as sectoral members.

A regulatory committee was formed within APROVALE, comprising six representatives of the wineries in the valley (whether or not using the PDO). This committee is elected by APROVALE members every two years and is responsible for management of the GI and for certification.

Its budget comes from membership fees. The subscriptions of wineries vary according to the quantity of quality wine produced, while sectoral members pay a flat sum.

External and institutional support

APROVALE receives regular financial support from the Regional Tourism Agency, which finances its structure and staff and the promotion of tourism and the PDO. It also receives ad hoc support from other institutions in connection with the promotion of wine, tourism and the region.

EMBRAPA gave major support to formulation of the specifications for the PGI and PDO by providing all the technical back-up. In addition, it supports the PDO value chain through quality control in the form of sensory tests or physical and chemical analysis.

Monitoring and guarantee system

The monitoring of origin and quality is guaranteed by the APROVALE Regulatory Committee, which carries out sensory tests of wines seeking PDO certification, with two members representing research or teaching bodies and one member representing consumers.

With support from EMBRAPA, APROVALE has developed a database with the area of each variety cultivated by winery and by vineyard in the region. In this way, APROVALE monitors the maximum possible quantity of PDO wine. Each year producers inform APROVALE of the volume of wine for which they want PDO certification. Before bottling, EMBRAPA carries out physical and chemical analyses, while the members of the Regulatory Committee organize sensory analysis. Once the minimum quality criteria have been confirmed, APROVALE issues a certification number for each bottle, which is stuck on the back of the bottle together with the PDO logo (see Figure 4).

The cost of PGI certification paid by wineries was about EUR 0.03 per bottle,[25] which was only 25 percent of total certification costs; the remainder, about EUR 0.09 per bottle, was financed by APROVALE. With the PDO, wineries pay no fees for certification, all fees being borne by APROVALE.

25 0.75 litre.

Figure 4: Vale dos Vinhedos PDO logo

5. Economic impacts of the GI process

In the case of the Vale dos Vinhedos wine GI, the following economic impacts can be highlighted (Table 1).

A number of impacts of the GI processes can be highlighted. The increase in reputation can be measured in particular through the development of tourism. The Vale dos Vinhedos is today the main wine tourism destination in Brazil, with about 300 000 visitors in 2014 and more than 400 000 in 2015, according to APROVALE.

This reputation has encouraged the creation of new wineries as well as the production of labelled wines. More than ten new wineries appeared between 1997 and 2015, and APROVALE has seen the number of its members rise by 18 wineries, most of which are involved in the PGI process. The expansion of some wineries has been remarkable, with their turnover increasing more than one hundredfold between 1995 and 2015 in some cases.

However, in the progression from PGI to PDO in 2012, which had started in 2009, the number of wineries involved in the process and the volume of wines certified fell (see Figure 5). The average volumes were also divided by seven, because of the very restrictive specifications for PDO certification. Some growers could not convert their vineyards (from training vines on trellises to the espalier system) or are in the process of doing so, which limits the availability of grapes. In addition, the recent creation of the PDO means that some of the impacts cannot yet be assessed: on the one hand, a period of adaptation to the new rules is necessary; and, on the other, the aging of wines means that the quantities concerned by the PDO do not yet appear in the available data.

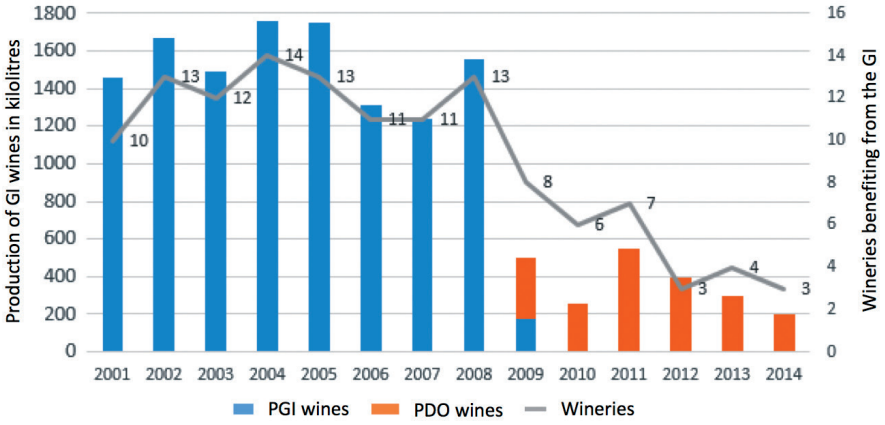
The PDO process has also had positive repercussions on the quality of certain wines in the region, even those not under the PDO. This

Table 1: Economic impacts

Variable	Impact	Scale of the impact	Method
Production	Average increase in production of grapes	Increase of 47.8% between 2001 and 2013 From 50 million kilograms in 2001 to 73.9 million kilograms in 2013	Descriptive statistics Master's dissertation
	Average increase in production of American/ Hybrid grapes	Increase of 40% between 2001 and 2013 From 384 900 tonnes in 2001 to 537 300 tonnes in 2013	
	Average decrease in PDO certified quantities	Decrease of 78% in the production of certified wine between 2012 and 2014 From 262 kilolitres in 2012 to 49 kilolitres in 2014	
Price	Average increase in PDO wine prices	The price of PDO wine ranged from EUR 19.90 to EUR 25.00 per litre in 2015, whereas the price of non-PDO wine ranged from EUR 13.75 to EUR 18.00 per litre	
Cost	Average increase in production costs following establishment of the PDO specifications	+ 50% for PDO wine as against non-PDO wine The average production cost of PDO wine in 2015 was EUR 15.55 per litre as against EUR 10.50 per litre for non-PDO wine	
Net profit	Increase in the net profit of PDO wine	+ 115% for PDO wine as against non-PDO wine The net profit on PDO wine in 2015 was EUR 6.60 per litre as against EUR 3.15 per litre for non-PDO wine	
Income	Average increase in income of wineries with PGI and then PDO certification	Between 2010 and 2015 + 186% for small wineries + 56% for large wineries	

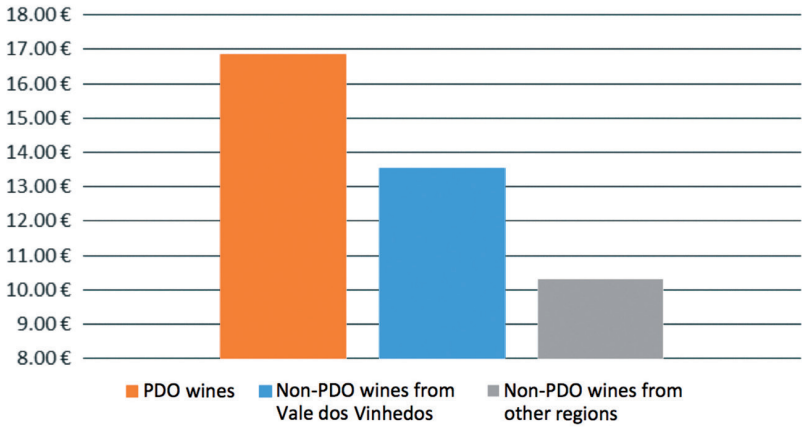
Source: Authors.

Figure 5: Evolution of volumes produced under GI and the number of wineries involved in the GI process between 2001 and 2014



Source: APROVALE, 2015

Figure 6: Prices of PDO and non-PDO wines, 2015



Source: 2015 data based on field surveys

Impacts on the territory

Tourism provides a major outlet for the region's wineries (and not just for those with PDO certification), thanks to direct sales. Economic activities linked to tourism and infrastructure are contributing more broadly to overall development of the region.
The development of tourism and regional development have also led to a major rise in property prices in recent years, sometimes by 500 percent. This sudden upsurge has enriched landowners who reinvest in activities in the area, but has also made access to land ownership very difficult for less well-off people, especially farmers.

emerges from interviews with stakeholders in the value chain, who report that the techniques advocated in the PDO specifications have been adopted by other producers on other varieties not accepted under the PDO or in vineyards located outside the PDO zone. This has led to an improvement in quality and has boosted the reputation of Vale dos Vinhedos wines more generally. Despite the smaller number of PDO-certified wineries, other regional wineries have benefited from this boosted reputation. The words "Vale dos Vinhedos" are increasingly being found on bottles of non-PDO wine, testifying to this indirect impact on other wines in the region; indeed, these words are often (fraudulently) used by producers of uncertified local wines, seeking to latch onto their promotional value.

A direct consequence of the establishment of the PDO was an increase in production costs, a

Typical Vale dos Vinhedos landscape

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result both of the investments needed to convert the vineyards and also of the limited yields from vines imposed by the PDO specifications. These requirements led to an increase in the price of grapes of between 40 and 70 percent depending on the variety, as against the price fixed by the government for grapes to make juice or table wine without any quality control. The increase in production costs thus led to a drop of 78 percent in the production of certified wines and a rise in the price of PDO wines, which are about 40 percent more expensive than non-PDO wines from other regions and 20 percent more expensive than non-PDO wines from the Vale dos Vinhedos zone (see Figure 5). PDO wines now have their place in a niche market.

The price increase has allowed PDO wine producers to achieve higher profit margins than those of other producers. The incomes of wineries with PDO certification rose substantially between 2010 and 2015 (+ 186 percent for small wineries and + 56 percent for large wineries).

6. Conclusion and future outlook

The establishment of the PGI, the first in Brazil, helped to boost the reputation of the region's wines. Obtaining the PDO and the innovations in production that it requires helped to build and establish the sensory quality of these wines. This reputation, combined with the values of the region as promoted by the GIs, has helped to develop tourism in the region.

The use of the name "Vale dos Vinhedos" has until now been of benefit to a large number of producers, whether their production is certified or not. This constitutes a threat to the reputation of the region, since this simple mention does not constitute any formal guarantee as to the origin of the grapes or the sensory quality of the wine. The most discerning consumers look for the PDO logo and certificate, but Brazilian consumers' scant familiarity with certification practices means that there is a real risk of deception. However, the wines of the region in general have a fairly high sensory quality and Brazilian consumers and tourists have not so far seemed disappointed with the quality of "Vale dos Vinhedos" wines.

Another threat concerns land prices, which have risen considerably, making the establishment of new agricultural enterprises almost impossible. Land has been attracting much attention from real estate businesses to build luxury residences, which could also represent a threat to the distinctive landscape of the region. On this matter, APROVALE is intervening with the government bodies responsible for protecting agricultural land to make them aware of the risks to the value chain.

Methodology

Sources

- Survey data (Michelotto-Pastro, 2015):
  - Interviews conducted in July and August 2015:
    - APROVALE (2 employees)
    - Wineries: 13 (out of APROVALE's 25 winery members)
    - 2 grape producers
    - 6 experts
- 9 wineries under PDO: data from 1995 to 2015 regarding production costs, prices, volumes, income
- APROVALE and IBRAVIN: data from 1995 to 2015 regarding number of wineries, volume
- Business France and Euromonitor: data from 2009 to 2015 regarding prices

Types of analysis

- Diachronic evaluation
- Descriptive statistics
- Mean comparison test

Acronyms

APROVALE	Vale dos Vinhedos Wine Producers Association
EMBRAPA	Brazilian Agricultural Research Corporation
GI	geographical indication
PDO	protected designation of origin
PGI	protected geographical indication

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