



Strategic Guide

on Sustainable
Food Quality Schemes



Welcome

In recent years, the sustainability of food supply chains has come into focus, along with their resulting impacts at the local level, from an environmental, economic and social point of view. In this context, Food Quality Schemes (FQS) represent prime examples of food production systems incorporating sustainable and traditional practices. They have been studied by a research group within 'Strength2Food', a European Union Horizon 2020 funded project, consisting of 13 European academic partners and 2 non-European academic partners who worked to assess the sustainability of FQS supply chains.

Within this project, the impacts of Food Quality Schemes (FQS) linked to good production and consumption practices were investigated. The positive impacts (or externalities) that are not remunerated by the market are called Public Goods. Their role in achieving sustainability is significant: they can contribute positively to the local development of rural communities and to the preservation of the production system at an environmental, social and economic level. However, despite their multiple benefits, public goods are not directly visible to consumers and typically are not economically valued. Therefore, within the Strength2Food project, good practices linked to FQS were explored and analysed. This guide reports the main findings.

This guide was conceived with a double purpose: (1) to present a methodology for the analysis of public goods: to this end, the type and characteristics of public goods and their driving factors (determinants) have been identified; (2) to highlight good practices that generate public goods: several examples are reported as an opportunity to generate a discussion both for farmers and other stakeholders. We hope that this guide can constitute a tool to manage and enhance public goods over time. Simultaneously, we hope it can also increase consumers' awareness of the relationships between FQS, public goods and sustainability, and enhance their willingness to pay for services embedded in FQS products.

Content

List of abbreviations and acronyms	4
Sustainability and Public Goods in FQS for consumers, citizens, and producers	6
1.1 Sustainability and public goods	6 - 7
1.2 Public goods typology for FQS goods	8 - 9
1.3 Public goods and territory	10 - 11
1.4 Public goods and valorisation strategy	12 - 15
Sustainability performance at value chain level – How to measure it? What did we learn from measurements in 52 benchmark value chains?	16
2.1 Key findings on the comparison between Food Quality Schemes and their conventional reference products	17
Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages	18
3.1 Cultural Heritage Preservation	18 - 23
3.2 Socio economic aspects	24 - 33
3.3 Use of Natural Resources	34 - 37
Recommendations for Action	38 - 39
4.1 Recommendations on cultural heritage preservation	40 - 41
4.2 Recommendations on socio-economic aspects	40 - 41
4.3 Recommendations on the use of natural resources	40 - 41
References	42
Authors	43

List of abbreviations and acronyms

CAP	Common Agricultural Policy
CEC	Enterprise chambers for Emmental and Comte cheese ripeners
CIGC	Inter-branch organisation for Comté "Comité Interprofessionnel de Gestion du Comté"
CO₂	Carbon dioxide
CoP	Code of Practice
DMO	Defence and Management Organisation
EU	European Union
FDCL	French federation of Dairy Cooperatives
FNIL	French National Federation of Dairy Industries for non-cooperative cheese manufacturing
FQS	Food Quality Scheme
GHG	Green House Gas
GIs	Geographical Indications
GMO	Genetically Modified Organism
LAFS	Localized Agri-Food System
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PG	Public good
TKR	Thung Kula Rong-Hai



1.1 Sustainability and public goods

The concept of sustainability has only recently entered everyday use. Sustainability refers to patterns of production and consumption that respect natural resources and their natural rhythms, focusing on long-term resilience and avoiding depletion of resources and environmental degradation. The EU oversees two FQS that seek to protect Geographical Indications (GIs), specifically the Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI). Both are part of the European Union’s quality policy, which “aims at protecting the names of specific products to promote their unique characteristics, linked to their geographical origin as well as traditional know-how”. The FQS production methods include a wealth of knowledge and good practices, handed down by generations of producers, aimed at making production processes more sustainable.

Good practices followed by producers and consumers can be grouped into two categories: those directly remunerated by the market through a premium price, and those not remunerated by the market. The first category includes private goods, while the second category includes impacts, often positive, termed Public Goods (PGs).

Figure 1. The three dimensions of sustainability

Public goods are important for societies, as they can contribute positively to local development in several ways; representing numerous benefits for producers and consumers. Benefits for producers include immaterial goods instrumental to enhancing skills, preserving quality, preventing unfair competition, and increasing the reputation of FQS and/or the territory. Further benefits are linked to facilitating relationships among stakeholders, reducing transaction costs, increasing the value of output by raising the firms’ reputation and facilitating the marketing of local products. These mechanisms can improve market efficiency, as well as preserve local knowledge, cultural heritage and local biodiversity.

Figure 1. The three dimensions of sustainability



1.2 Public goods typology for FQS goods

Food products classified as FQS (for example Organic and GIs) generate public goods, which are not directly visible to consumers at the time of purchase and consumption. The positive effects of public goods appear after consumption, through positive impacts on consumer health, the preservation of natural resources, and the resilience of producers.

If it is true that public goods are not immediately visible to consumers and are not valued by the market, we could ask: why is it important to maintain and preserve public goods associated with FQS? The answer is simple: the presence of public goods allows the preservation of the production system from an environmental, social and economic point of view. At the same time, public goods make it possible to differentiate competing products on the market.

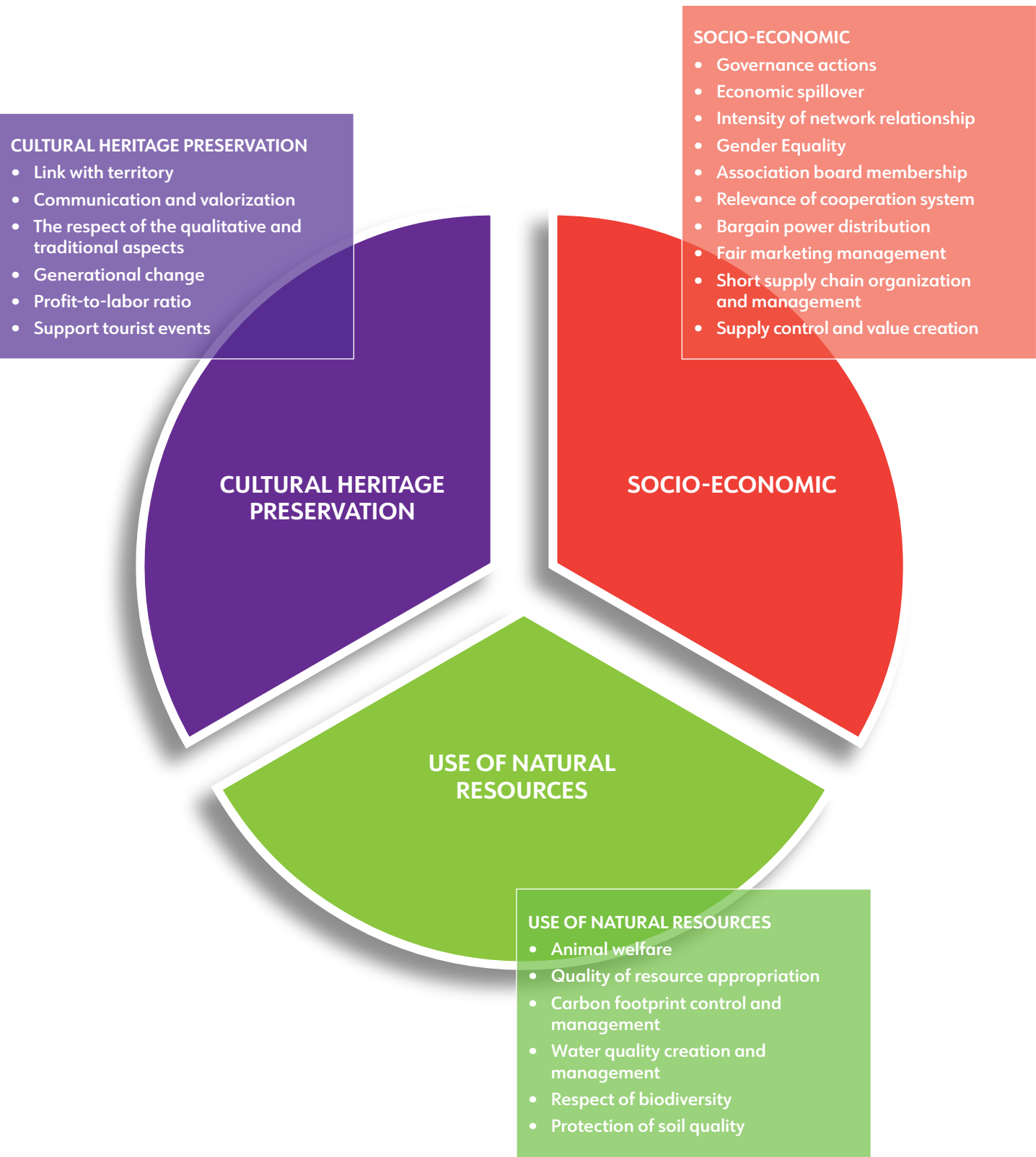
For this reason, it is important to make consumers aware that the food products identified as FQS directly include a specific level of public goods. This might persuade them to pay a higher price for FQS products, as they reflect greater effort made by producers and the services provided in the territories. Different mechanisms and specific communication strategies can be adopted to lower information barriers between producers and consumers. These can vary according to the features of the value chain and to the commercial outlet chosen by producers.

Public Goods can be grouped according to three dimensions: cultural, socio-economic, and environmental (Figure 2). This typology is similar to the classical segmentation of sustainability pillars into economic, environmental and social aspects (see Part 2).

Figure 2. Classes of Public Goods and their determinants

Considering the cultural, socio-economic, and environmental dimensions, it is important to have a conceptual framework that helps understand the ability of FQS and GIs to generate public goods. An additional element we need to consider are externalities, namely the consequences of commercial activities that are not reflected in market prices. Externalities can be positive or negative. GI systems can produce different types of public goods that can be traced back to cultural, environmental, social and economic externalities. The level of positive externalities generated depends on the features of the Code of Practice (CoP), on the commercial and economic strategies that firms adopt, and on the social and environmental features of production and consumption patterns. Potential beneficiaries of positive externalities can be either members of the value chain (producers and/or consumers) or citizens living in the production area. In light of this distinction, public goods have a different meaning and value according to whether it is analysed within the value chain or the geographical region.

Figure 2. Classes of Public Goods and their determinants



1.3 Public goods and territory

The Localized AgriFood System (LAFS) approach is a conceptual framework used to understand the relationships between public goods and territories. This framework links production and consumption, on the one hand, and the ability to generate different types of public goods for the benefit of the environment, people and the production sector, on the other.

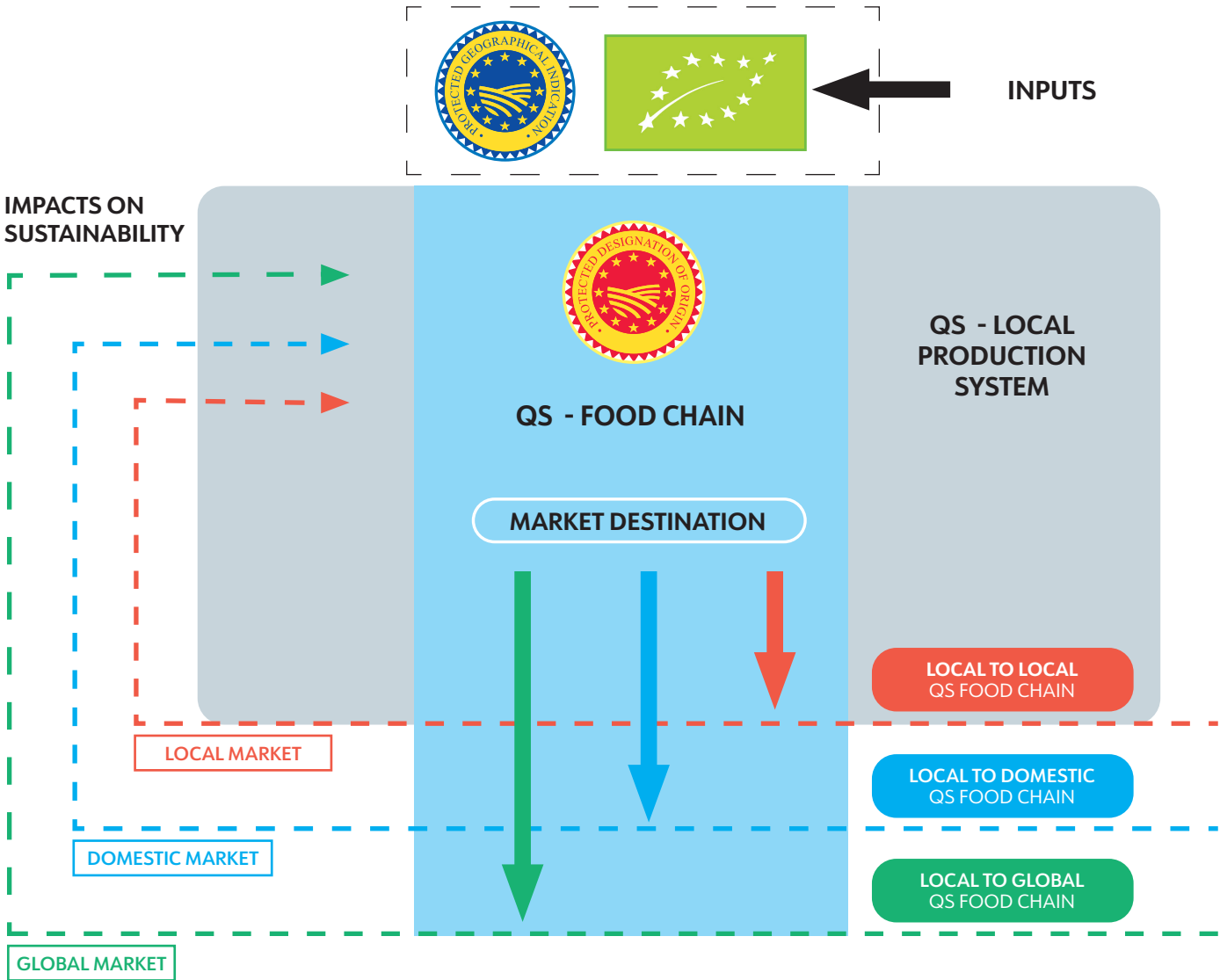
The LAFS approach allows us to interpret the ability of local food systems to generate and, especially, to

manage quality value chains. The LAFS approach thus considers the value chain embedded in the territory in its environmental, social, and economic components. The type and the size of externalities related to PGs differ in relation to the features of the value chains, which may lie entirely inside the production region, or may have no boundaries, when supplying raw materials and /or consumer markets (Figure 3).

Figure 3. The Localized Agri-Food System Approach

The LAFS approach makes it possible to consider Public Goods (PGs) generation at different levels of the value chain, differentiating upstream and processing levels, and at the regional level, where these levels can have different dimensions according to the specificity of the production system. In this case, the environment, products, local communities with their know-how, their institutions, their food habits, and their networks combine in a territory to set up an agri-food organization in a defined spatial area. This framework captures the relevant elements for assessing the strategies of local actors in production and consumption, and for assessing the impacts of the different types of externalities (environmental, cultural/human, and governance) and the related PGs. Use of the LAFS approach makes it possible to consider both the chain structure (farming and processing) and the territorial dimension (the area defined by the CoP).

Figure 3. The Localised Agri-Food System Approach



Sustainability and Public Goods in FQS
for consumers, citizens, and producers

1.4

1.4 Public goods and valorisation strategy

The presence of positive externalities associated with GI products is a positive qualifying attribute for the food product and for the entire agri-food system that generates it. This guide presents several good practices adopted within the production systems, and classifies the good practices generated, according to the public goods, which link the LAFS and the related GI products.

For this purpose, it is necessary to identify: (1) the type and characteristics of public goods generated by the production system; (2) the driving factors (known as determinants) that generate public goods; (3) and how public goods can be managed and valorised over time. These elements are outlined in the Tables below, articulated into cultural (Table 1), socio-economic (Table 2), and environmental (Table 3) dimensions.

Table 1. Cultural and heritage preservation public goods

Class of Public Good	Determinants	Management and valorisation
Cultural Heritage Preservation	Link with territory	Historical elements and sustainability
	Communication and valorisation	Quality certification mark
		External communication strategy
		Training / educational activities for producers and consumers
		Professional training on the FQS
	Respect of the qualitative and traditional aspects	Product distinctiveness
		How the CoP includes and guarantees the respect of the qualitative and traditional aspects
	Generational Change	Productive system reaction to generational change
	Profit-to-labour ratio	Profitability for families
	Support for tourism initiatives	Tourism

Table 2. Socio-economic public goods

Class of Public Good	Determinants	Management and valorisation
Socio-economic	Governance actions	Sustainability and corporate mission
		Market regulation systems
		Use of quality mark
		Certification system
		Monitoring system
		Accounting for sustainable and good management
		Manage of conflicts and disputes
		Updating rules democratically
		Agreement with local administrators
		Strategies or actions (research projects, etc.) aimed at improving sustainability
	Economic spill-over	Contribution to local economy
	Intensity of network relationship	Relationship with local politics or administrations
		Link between society and producers
	Gender Equality	Role of women
	Association board membership	Representativeness of the supply chain in the consortium
	Relevance of cooperation system	Role of cooperatives in the supply chain governance
	Bargain power distribution	Sustainability of the supply chain structure
		Individual or collective management of sustainable issues
	Fair marketing management	Marketing strategies
		Segmentation of product
	Short supply chain organization and management	Direct sales
	Supply control and value creation	Production quotas

Table 3. Natural resources public goods

Class of Public Good	Determinants	Management and valorisation
Use of Natural Resources	Animal welfare	Management and valorisation
		Animal health
	Quality of resource exploitation	How the CoP guarantees the respect of resources from exploitation
	Carbon footprint control and management	CO2 emissions management
	Water quality creation and management	Water management
	Respect of biodiversity	Respect of Eco-system biodiversity
		Respect of species biodiversity
		Respect of genetic biodiversity
	Protection of soil quality	Practices to assess and guarantee soil quality
		Practices to assess and guarantee land quality



Sustainability performance at value chain level –
How to measure it?
What did we learn from measurements in 52 benchmark value chains?

2.1

This section outlines how the sustainability performance of a food value chain can be assessed. The detailed method, tools, data and results from 52 benchmarked value chains are available to help other value chains to conduct such assessments. One key lesson of these benchmarks is that there is a large variability in performance between FQS, meaning that many FQS should be able to improve their performance, learning from the practices and governance of other FQS. The opportunity for “Learning from Practice” and a guide to navigate the good practices of these benchmark FQS are presented in Part 3.

2.1 Key findings on the comparison between Food Quality Schemes and their conventional reference products

The assessment of the economic, social and environmental impacts of FQS (including organic, PDO and PGI products) identified the main factors influencing the performance and evolution of FQS and related LAFS. This assessment was based on data from 26 FQS case studies in 14 countries, where each FQS was compared to a non-certified reference product in the same country or to the national average for the relevant value chain.

A dataset containing 24 indicators of economic, environmental and social performance, estimated for 26 certified food value chains and their 26 conventional reference products, was developed (see Table 4). The indicators are estimated at different levels of the value chain: farm level, processing level and retail level. A common method was used to collect data for the twenty-six certified products and their conventional counterparts. The process of data collection and the indicator estimation methods designed to assess the three sustainability dimensions, within a reasonable time constraint, are shown in the documentation of the dataset (Bellassen et al., in press). The full dataset, including all raw data, estimated indicators and tools can be freely downloaded and used as a benchmark for assessing new food chains and/or to assess the progress

towards sustainability of a given food chain over time. The assessment of economic performance relied on the calculation of price premiums, profitability and value-added distribution (gross value-added, gross operating margins, net results), trade and local multipliers. Environmental performance was measured in terms of the carbon footprint, water footprint, food miles and food waste. Social performance was measured in relation to social capital, governance and bargaining power, generational change, and gender equality.

From an economic perspective, the findings indicate that FQS, in the majority of cases, perform well in terms of classic economic indicators, compared to non-GI equivalents, except regarding exports. From an environmental point of view, FQS, on average, perform well in terms of lower GHG emissions per hectare and shorter distance travelled by products. This is because FQS produce fewer transport-related emissions, being sold mainly on local and national markets, and less on international ones. Moreover, in some cases, technical specifications are responsible for the fewer food miles of FQS products. Specifications for PDO products, for instance, lay down a fairly small geographical area for production and processing, reducing the distances between farms and processors.

However, the carbon footprint of GIs and comparable non-GI equivalent products, expressed in terms of per tonne of product, is similar. The results are similar for water pollution by nitrates (grey water footprint). Specifically, the performance of FQS is better on a per hectare basis, but similar to conventional products on a per tonne of output basis. Overall, no differences emerged between FQS and reference products regarding blue, grey and green water footprints, except for organic products, which record a better performance than equivalent reference goods in terms of their blue water footprint.

On social aspects, FQS perform better on indicators related to employment and bargaining power along the value chain. FQS products provide greater employment per tonne of product while ensuring a higher turnover per working unit. FQS also seem to have the edge regarding educational attainment and generational renewal, but this was not statistically significant. Finally, FQS and their conventional equivalents are similar regarding employment of women. Beyond these observations, an overarching finding is that FQS performance on each sustainability aspect varies considerably; for all indicators except price, there are some FQS that perform worse than their reference value chain, on at least one sustainability aspect.

Table 4: 26 Certified food value chains and associated reference products

Organic		PDO		PGI	
Flour	France	Comté Cheese	France	Buon Ma Thuot Coffee	Vietnam
Pasta	Poland	Kalocsa Paprika	Hungary	Dalmatian Prosciutto	Croatia
Pork	Germany	Olive Oil	Croatia	Doi Chaang Coffee	Thailand
Raspberries	Serbia	Opperdoezer Ronde Potatoes	Netherlands	Gyulai Sausage	Hungary
Rice	France	Parmigiano Reggiano Cheese	Italy	Kastoria Apples	Greece
Salmon	Norway	Phú Quốc Fish Sauce	Vietnam	Kasubskie Strawberries	Poland
Tomatoes	Italy	Saint Michael Bay Bouchot Mussels	France	Lofoten Stockfish	Norway
Yoghurt	Germany	Zagora Apples	Greece	Sienica Cheese	Serbia
				Sobrasada Porc Negre	Spain
				Ternasco de Aragón Lamb	Spain
				TKR Horn Mali Rice	Thailand

In this section, the best practices associated with the determinants of each class of public good are presented using examples from EU Strength2food case studies. The complete database can be consulted at: <http://rosa.unipr.it/fa/> Each determinant requires a management and enhancement/valorisation strategy. Leaders of FQS case studies identified instances of good practices, which are highlighted here.

3.1 Cultural Heritage Preservation

Determinants that impact upon cultural heritage preservation are: (i) link with the territory; (ii) communication and valorisation, including educational activities aimed at disseminating the quality and characteristics of the GI; (iii) respect for qualitative and traditional aspects, i.e. whether product is distinguishable by characteristics and names, and how the CoP guarantees the respect of the qualitative and traditional aspects concerning sustainability; (iv) generational change, whether and how production systems react to generational change to allow for knowledge transmission to future generations; (v) profit-to-labour ratio, indicating good practices that support profitability of farmers and families in order to allow the future sustainability of the production system; (vi) support for tourism initiatives to disseminate the history and culture underpinning the GI. These are described below.

Link with the territory

FQS have a close link with their territory of production, which contributes to the conservation of cultural

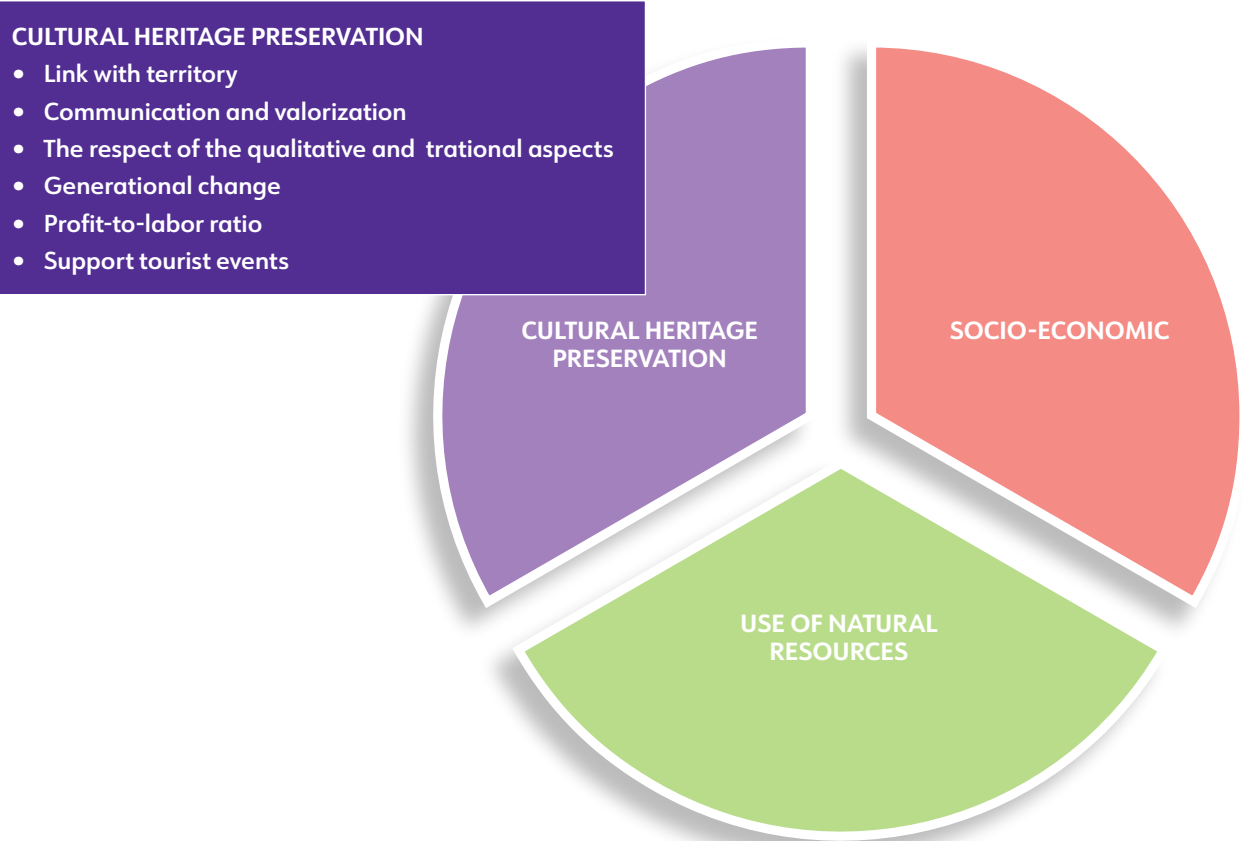
heritage and to environmental, social, and economic sustainability. The characteristics of sustainability embedded in these products have allowed their maintenance over time, in a process of co-evolution with the territory. Several FQS are the product of their own ancient history: closely linking social, cultural, and religious developmental aspects of a place as well as its community. In these cases, the production system enhances and preserves local characteristics and features which are intrinsic to the product itself, thus guaranteeing sustainability from an environmental and economic point of view. Certain FQS products, like Moules de bouchot, however, have been developed more recently, in response to a need to revitalize the territory from an economic point of view. In these cases, the introduction of a new production system required a process of adaptation to the area, and generated new knowledge through experimentation. In all cases, FQS products are embedded in the territory: on one hand they contribute to the preservation of cultural heritage by generating positive externalities from an economic, social and environmental point of view; on the other, they require a system of rules and support via local governance to recognize their value, as seen in the case of Moules de bouchot.

Historical elements and sustainability example: Moules de bouchot seafood (France)

The production of “Moules de bouchot de la baie du Mont-Saint-Michel” was introduced on a commercial scale only in the 1950s. The term “bouchot” refers to a traditional aquaculture technique, where wooden stakes are sunk into the sand of the foreshore area to provide an

area for the muscles to accumulate. Some local farmers started testing this technique, and a mussel farm at Le Vivre Sur Mer was set up. However, the rapid expansion of mussel production led to regular overproduction, and collaboration was necessary to overcome the crisis. The sustainability of this product is in fact closely related to the high level of coordination in production, which allows for adaption to the environment and its fragilities.

3.1 Cultural Heritage Preservation



Communication and valorisation

The conservation of cultural heritage is supported by communication, education and valorisation activities linked to the FQS products. Communication activities, together with the quality certification mark, provide consumers with information about the intrinsic and extrinsic characteristics of the product, its links with the territory, and its traditional know-how. These activities are crucial in conveying the quality of a product and in ensuring its promotion. Parmigiano Reggiano presents good practices related to communication activities and the certification mark, while the Sobrasada de Mallorca case highlights the main strategies for external communication. These are: developing an internet website to promote the product and to disseminate news about the consortia/ association/companies; publishing information pamphlets for consumers with particular attention given towards involving students; publishing books of recipes; strengthening the alliance with the out-of-home sector such as restaurants; facilitating contact between consumers and producers/distributors to promote direct

sales. In addition to external and consumer-oriented communication strategies, educational initiatives targeting producers are important for valorising FQS products. These are often supported by consortia or local administrations: their goal is to support the actors of the value chain (producers, processors, etc.) to meet and comply with the FQS standards. Education and training for producers is also important, such as the publication of a guidebook to help members and stakeholders to evaluate quality, track origin and protect the brand-name of the product; and technical assistance to provide advice or training to help producers to comply with health, safety, labelling, and traceability regulations. Finally, in some cases, professional training is offered in collaboration with educational institutions (universities, research institutions and high schools), with the purpose of disseminating knowledge, stimulating innovation and delivering courses on genetics, nutrition, and production system management. In other cases, cooperatives and consortia participate in national and international research and innovation projects to gain innovative and educational benefits.

Quality certification mark: the example of Parmigiano Reggiano hard cheese (Italy)

According to the rules contained in the Production Regulation, this cheese is the only type entitled to bear the Parmigiano-Reggiano mark, and the wheel must display all the marks required for identifying and distinguishing the product. These marks are divided into “marks of origin” and “grade selection marks”. Marks of origin are placed on the cheese wheel at the beginning of the production process. They include: 1) a stencilling band, surrounding the entire wheel, which has the pre-punched dots reading PARMIGIANO-REGGIANO, the acronym DOP and CONSORZIO TUTELA, the identification number of dairy and production month and year; 2) Casein plate applied on the surface that shows the production year, the acronym C.F.P.R. (Consortio Formaggio Parmigiano-Reggiano) and an alphanumeric code identifying each single wheel. As regards selection marks, the Consortium identified and registered the mark, which is a cheese wheel and wedge with the words PARMIGIANO-REGGIANO on a black background, as a visual sign identifying Parmigiano-Reggiano.

Respect of qualitative and traditional aspects

The conservation of cultural heritage is supported by two key elements: product distinctiveness and respect for the qualitative and traditional aspects of FQS products. Product distinctiveness concerns the attributes of the product, identified by its name or characteristics. GI products are known by their names and labels, which refer to a set of strict production rules defined by the

Product distinctiveness: the case of Kalocsa Paprika (Hungary)

‘Kalocsa Paprika’ is a PDO product. As such, it is distinguishable by the PDO label, which leads to the expectation of high quality, and by its name, unique to the product, representing quality and strict production

Good external communication practices: Sobrasada de Mallorca cured sausage (Spain)

Over the years, the consortium managing the Sobrasada de Mallorca organized many initiatives with the aim of increasing the consumption of sobrasada and achieving economic sustainability. The most successful action was the result of a collaborative approach (including the consortium, local authorities, schools and processing firm) aimed at the publication of information pamphlets for school students. These had the goal to raise students’ level of identification with the main food products made in Majorca, and encourage local consumption. Another successful initiative was the publication of a book of recipes, supported by the Government of the Balearic Islands, in which a renowned chef presented recipes with quality products, in order to show the versatility of sobrasada for cooking.

codes of practice. The names of GI products are linked to a production area: this includes the raw material and/or processing techniques, and the intrinsic characteristics of the product (aromatic richness, nutritional properties, breed or seed variety etc) linked to the ecosystem of the area. An example is provided of Kalocsa Paprika. Additionally, the case of Comté cheese illustrates the respect for qualitative and traditional aspects of FQS guaranteed by the CoP.

rules. It must be manufactured by ground paprika grown in the Kalocsa region (Hungary) from seeds of certified species. The legislation also specifies the exact physical and chemical attributes of paprika, such as minimum pigment content, maximum moisture content, particle size, level of pungency described by ranges for capsaicin content, and the prohibition of any additives.



Respect for qualitative and traditional aspects: the example of Comté cheese (France)

The CoP of Comté cheese specifies production criteria based on traditional aspects: the entire process from milking to processing must take place in the PDO area; cattle breeds must be only Montbéliarde or Simmental;

cattle must graze for as long as possible, and from spring onwards at least half of the feed must be grazing. Cows are fed with high quality fodder, which must come from the PDO area. Fermented fodder (silage) or GMO are not permitted. A tightly controlled range and quantity of mineral and organic fertilizers and phytosanitary products are permitted.

Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.1

Generational Change

Good practices that ensure generational change, instrumental to the conservation of cultural heritage and inter-generational transmission of know-how, are essential to support GI sustainability. This is evidenced in the case of Zagora Pilios apples in Greece. However, this aspect represents a weakness in most cases.

There tend to be fewer younger people employed in agriculture, as this type of work is hard and no longer attractive for younger generations. In some cases, though, social cohesion encourages working towards a common goal, involving younger generations in farm activities; in other cases, farmers enlarge and modernize the farm to make their inheritance more attractive.

Productive system reaction to generational change case: Zagora Pilios apples (Greece)

Workers of the Zagora apples cooperative continue to preserve the historical initiative of the priest Konstantinos Samaras, who founded the cooperative back in 1916. This cooperative is characterised by a

strong collaboration between its members and local workers. The different percentages of males and females working in the cooperative and the different educational attainment levels blend together into a strong local community, which works together towards the common purpose and goals of the cooperative.

Profit-to-labour ratio

Profitability for farmers is supported, in some cases, by GI-certified cooperatives. On one hand, these supply financial support, technical training, and farm tools, while, on the other, they support local jobs and ensure fair payments to local farmers and families. Another channel ensuring profitability for farmers is the higher

prices commanded by GI products. This is fostered by sales methods such as the sale of GI products to tourists, and direct sales to consumers, which allow higher prices, reduced brokerage costs and greater awareness of local production among consumers. Higher returns are possible in emerging economies like Vietnam, as well as in evidence in those countries with the most registered GI products like Italy and France.

Profitability for farmers and families: evidence from Vietnam

Buon Ma Thuot Coffee (Coffee, Vietnam)

Farmers obtain support through GI-certified cooperatives which give them financial support, technical training, fertilizers and farm tools.

Phú Quốc (Fish Sauce, Vietnam)

Workers and processors may receive higher incomes due to higher prices for PDO fish sauce. Consumers are more aware of (and prefer) the PDO fish sauce. This brings sustainable profitability for producer families.



Supporting tourism

Tourist events promote the dissemination of a product’s history and its territory, contributing to cultural heritage preservation, as witnessed in the case of Kafae Doi Chaang (Thailand). Good practices are connected to activities such as: farm tours, to observe the GI production process and taste the products; festivals to

promote local recipes; museums/academies teaching the history of the GI production process; and tourist itineraries including restaurants offering dishes based on the GI. The organization of these initiatives requires the involvement of local institutions (municipality or regional offices) and partnerships between institutions, farmers, cooperatives, restaurants and chefs.

Tourism activities case: Kafae Doi Chaang coffee (Thailand)

The Academy of Coffee was established in 2007. Initially, it was used to teach coffee growers how to produce good quality coffee, but it is now open to the public

and teaches people about the coffee making process, from planting to brewing. High quality coffee also has a positive economic impact on tourism, as many people are attracted to visit Doi Chaang Mountains, stay in farm accommodation and enjoy Doi Chaang cafe.

3.2 Socio-economic aspects

Factors that impact on socio-economic sustainability are: (i) governance mechanisms facilitating the organization and management of the supply chain; (ii) economic spill-overs, which highlight the FQS’s contribution to the local economy; (iii) intensity of network relationships, which facilitates support to the value chain by local administrators and civil society; (iv) gender equality, which shows the extent to which the production system recognizes the role of women and other vulnerable categories; (v) membership of association boards, reflecting the representation of the supply chain in the system; (vi) dimensions of the cooperative system, showing good practices that give cooperatives a role in supply chain governance; (vii) distribution of bargaining power; (viii) marketing management, or marketing strategy and product segmentation strategy; (ix) short supply chain organization and management; (x) control of supply and creation of value, including prevention of overproduction. All these elements are described in more detail below, with illustrative examples.

Governance actions

Governance actions focused on sustainability include: the adoption of sustainability as a corporate mission; market regulation systems, certification systems and the use of quality mark; the monitoring and accounting of

sustainable and good management; the management of conflicts and disputes; agreements with local administrators; broader actions (i.e. research projects) aimed at improving sustainability. As seen in the Ternasco de Aragón case, GI companies/consortia/associations often adopt sustainability as a corporate mission. In some cases, they follow the Common Agricultural Policy (CAP) recommendations on breeding, or more general practices preventing environmental degradation. In other cases, there is co-operation with national policy: national laws authorize the inclusion of environmentally-driven restrictions in the CoP of GIs, which give consortia the opportunity to reduce environmental risks. Environmental regulations favour the adoption of practices to reduce pollution or control the trophic capacity of the environment. Concerning market regulation (e.g. the Comté case), GIs have mandatory production specifications, which lie outside traditional strategies for competing on cost. Consortia/associations/cooperatives have thus introduced rules to protect the value chain and guarantee product quality. Specific quotas of raw materials or final products are used as a tool to limit production capacity, regulate supply to ensure the absorption capacity of the market, and preserve traditional processing systems. Other strategies introduced are the search for new markets, through exporting, and the strengthening of relationships with local administrations and other local stakeholders.

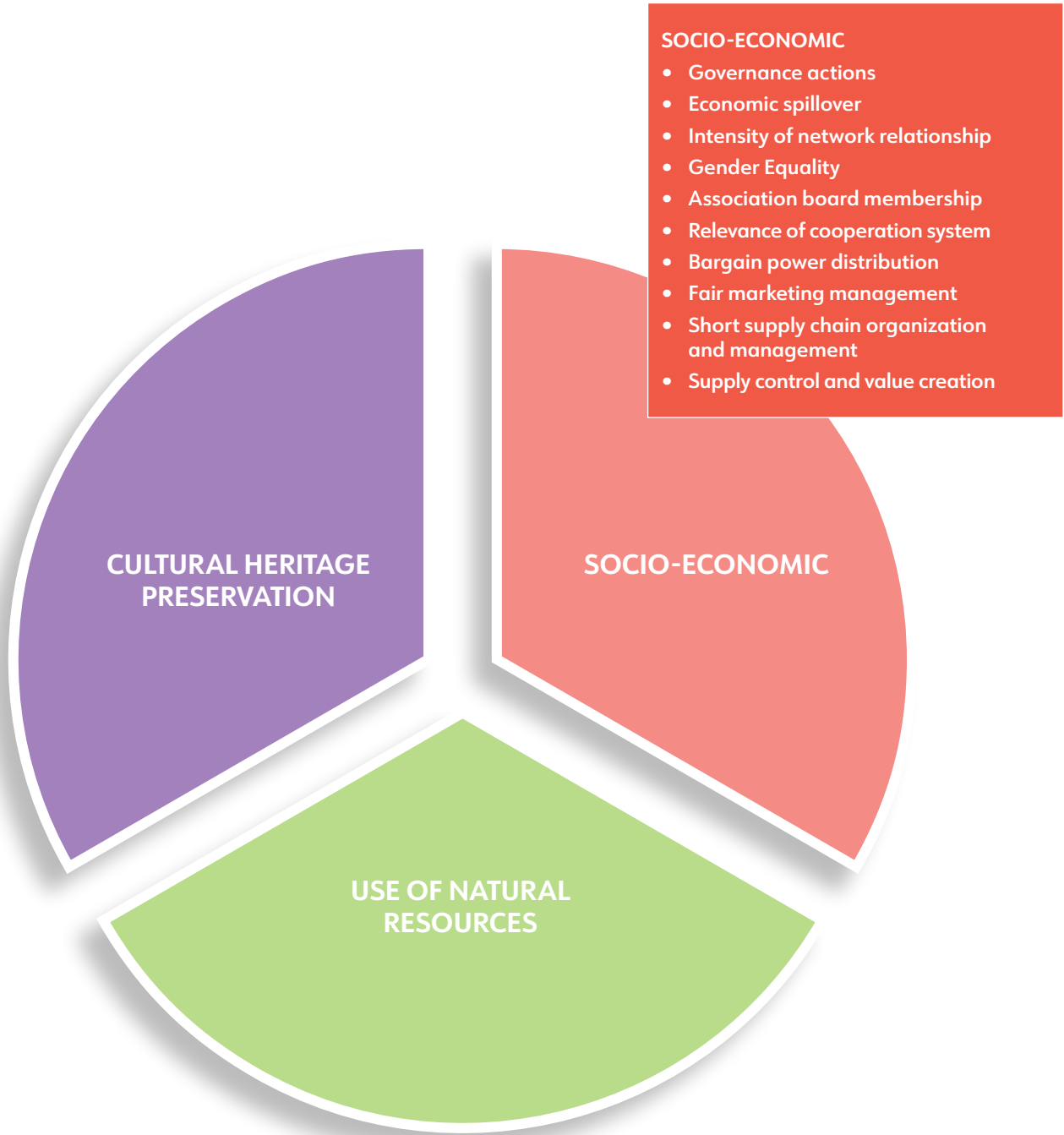
Sustainability and corporate mission: Ternasco de Aragón lamb meat (Spain)

GI Companies have adopted sustainability as a corporate mission explicitly and implicitly. Explicitly, because farms follow an extensive grazing model. The latter is a sustainable livestock farming system, since it utilizes pastoral resources that otherwise would be unused, together with stubble fields, post-harvest waste and agricultural sub-products. Implicitly, the traditional lamb breeding system is characterized by mountain grazing and a stabling phase. Grazing therefore takes place in mountainous areas and contributes to maintaining and preserving the traditional landscape.

Market regulation systems: Comté cheese (France)

The market regulation system of Comté was able to introduce rules to protect the production system, for example limiting milk production, which cannot exceed 4,600 litres per hectare, and limiting the size of fruitières in terms of production capacity. Further limitations were imposed on ripeners, establishing that the processing of milk into raw cheese must be executed in a different building than the processing of raw cheese into ripened cheese.

The use of quality marks (as illustrated in the case of Comté) is defined at national, European and consortium levels. First, the consortium/company or association submits a request for PDO. Second, a commission



Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.2

checks the submission and allows the adoption of the PDO or PGI label if all the requirements are met. Subsequently, the consortium or association defines the internal use of quality mark, a tool to inform the consumer of the uniqueness and quality of the product. The quality mark ensures the traceability of inputs and health and safety aspects according to national and European requirements, as well as the compliance with the producing and processing practices defined by the Codes of practice. The certification system requires an organized monitoring system that can ensure the respect of rules (as seen in the case of Kafee Doi Chaang). Monitoring systems are only indirectly linked to sustainability, but they enforce the use of the CoPs, which often has characteristics guaranteeing both environmental and economic sustainability. Under the internal control system, the GI committee at local level has a responsibility to inspect the operation of producers, processors, farmers, and industries that have a self-control system. An external monitoring system is entrusted to professional organizations or consortia responsible for the quality scheme and the production management following common guidelines that safeguard product characteristics.

Use of quality marks in the case of Comté (Cheese, France)

Comté is a French cheese bearing a PDO label, a casein label, and sometimes a green label. Labels must be put on every wheel of Comté at the time of its manufacturing and they are mainly used to keep track of production. A dairy which produces more than expected can purchase casein labels from other workshops or the inter-branch organisation called “Comité Interprofessionnel de Gestion du Comté” (CIGC) at a higher than normal price. Each cheese receives a mark according to its external and internal appearance, the quality of its rind, its texture and its taste (ranked from 1 to 20). Cheeses scoring 14 points or more, called Comté Extra, are given a green casein label with the recognizable logo of a green bell. Those scoring between 12 and 14 points are given a brown label and are simply called Comté while all the others with lower marks do not receive the Comté name and are sold for different purposes.

Certification system: the example of Kafee Doi Chaang coffee (Thailand).

The certification system is effective by virtue of its GI control mechanism, including self-control, internal control, and external control, all geared towards maintaining and monitoring the GI logo. In the case of the Kafee Doi Chaang coffee, the Department of Intellectual Properties of Thailand helped communities to set up internal control systems, and provided budget support for internal controls. Public entities, including the Agricultural office and universities, assisted coffee growers through the provision of know-how and technological support, with the purpose of improving the quality of coffee cherries and reducing costs.

As witnessed with Phú Quốc fish sauce, the governance dimension also entails accounting systems for good, sustainable management. GI organizations change production plans every year and draw up the budget according to costs and expected incomes. An internal board approves the budget and an independent auditing company assesses the accounts every year. In some cases, public accounting services are available for farmers.

Accounting for sustainable and good management: Phú Quốc fish sauce (Vietnam)

The amount of Phú Quốc sold is monitored very carefully annually. Quantities of the fish sauce produced and sold are compared each year, and production targets adjusted every year depending on the local and external market figures. Moreover, the quantity of anchovies harvested for the fish sauce is limited and controlled.

Consensus building through dialogue is a fruitful way to manage conflicts and disputes. Consortia or associations establish sets of rules, which can resolve conflicts (as in the Tørrfisk from Lofoten case). Consortia, cooperatives, associations or other bodies that take into account producers’ needs, should ensure the rules are updated democratically.

Management of conflicts: the case of Tørrfisk from Lofoten (Fish, Norway)

In the case of the fishermen from Lofoten (Norway), creating a GI consortium and CoP was a way to solve previous conflicts and disputes. The process of collective action needed to establish the consortium fostered a sense of collective belonging and helped calm previous disputes. To this day, when conflicts emerge, the consortium tries to solve them through dialogue and collective discussions.

The relationship with local administrators is fostered by the fact that GI value chains have a positive economic and social impact on local development. Local governments support GIs in various ways: contributing to the development of the scheme; supporting marketing; financing research or innovation projects; supervising and managing producers’ associations; promoting and financing tourist activities; and supporting local festival and fairs. This is evident in the case of Zagora Pilio apples.

Agreement with local administrators: Zagora Pilio apples (Greece)

The promotion of the Zagora Pilio PDO apple through co-operation with the local administration of Pilio, enhances the development of the local area, as well as of the local supply chain. Collaborative support to the PDO by the co-operative and local administrators comes in the form of supporting local farmers, i.e. providing apple seedlings for new orchards and providing guidance regarding the management of the orchards. These activities increased the supply of PDO apples.

Finally, the consortia/associations/companies introduce strategies aimed at improving sustainability (as seen

Economic spill-overs

GIs contribute to the local economy both directly and indirectly. They contribute directly through the rules established by the CoP, which anchor the origin of raw materials, or other activities at the processing level, to a designated geographical area. In this way, the CoP supports employment and income generation in the

Contribution to the local economy: Parmigiano Reggiano hard cheese (Italy)

There is growing evidence that the prosperity of

in the case of Hom Mali rice): projects to enhance production efficiency; development of marketing strategies to increase the incomes of farmers; projects aimed at the development and introduction of innovations and new technologies; projects aimed at identifying sustainable production methods; organization of training and seminars about innovations in the value chain; development of services such as product testing laboratories, training and technical support. All these activities are developed in co-operation with research centres, local administrations or government or other associations, and are possible by virtue of the collaboration of all actors in the value chain.

Strategies or actions aimed at improving sustainability the case of Hom Mali rice (Thailand).

In 2004, the government of Thailand initiated the project “Production of Thung Kula Rong-Hai Hom Mali Rice for Exports”. The initiative included collaborative efforts between several organizations under the Ministry of Agriculture and Cooperatives (MOAC). Following this project, between 2009 and 2010, the Cooperative Promotion Department established the project “Thung Kula Rong-Hai Hom Mali Rice Cluster Development” to enhance rice production efficiency, develop rice products to meet market demand, and contribute towards improving the income and livelihoods of farmers. After a few years of collaboration between member cooperatives, and with support from local universities, i.e. seminars and training, the cluster improved rice production through a better understanding of the market and enhanced production methods. Furthermore, market channels were widened to supply major rice exporters.

production area, favours knowledge transmission and stimulates the economic performance of local actors. Local areas can thus become highly specialised in the production of a GI, developing a value chain that can become highly competitive at international level. GIs also generate indirect economic benefits for actors within the local area, for example attracting tourism, which is an economic spill-over (see case of Parmigiano Reggiano).

the Emilia-Romagna economic district of Italy is linked to the production of PGI and PDO products. Specific geographical restrictions regarding forage and milk origin promoted the expansion of forage

Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.2

production activities in the area. The high number of slaughterhouses in the area guaranteed that calf rennet is provided by local companies, even though there are no specific regulations concerning this issue. Upstream, farmers and cattle breeders who supply dairies with milk have to be located inside the designated area: this is, therefore, another requirement that stimulates the

economic performance of local stakeholders. All steps in processing, from production to ripening, cutting, grating and packaging must take place within the local area. This set of rules contributes to the development of a high excellence cluster for the food supply chain in Emilia Romagna, specialized in cutting-edge technologies for preservation, cutting, and storage.

Intensity of network relationship

GI products establish a network of relationships inside and outside the production system, including local communities and local administrators. These synergies produce positive socio-economic impacts on the geographical area. The link between producers and local community is especially strengthened by the organization of recreational and touristic events

aimed at promoting the GI (e.g. Sobrasada de Mallorca case). Local administrators and decision makers are often aware of the economic benefits of GIs for local development and value chains. For this, they often support the GI value chain, through financing the costs of technical assistance, financing research and innovation, and promoting the creation of hubs that offer a range of services to the farmers (e.g. case of Sjenica sheep cheese).

Link between society and producers: Sobrasada de Mallorca cured sausage (Spain)

The link between producers and the local society is strengthened through the organisation of promotional activities for Sobrasada, such as traditional festivals and itineraries visiting certified sobrasada producers. This created a synergy with mutual benefits, where local actors benefit from the high reputation of the products, and producers benefit from the promotional activities of the local community.

Relationship with local administrators: Sjenica sheep cheese (Serbia)

In 2016, Sjenica municipality started the application process for Sjenica cheese to gain UNESCO intangible cultural heritage status. It was supported in this goal

by the EU programme European PROGRES, the largest area-based development Programme in Serbia. Through this support, producers from Sjenica gained technical assistance to obtain protected GI status. Moreover, local administrators established a regional centre for development of agriculture in 2011, which includes a modern laboratory for testing the chemical and microbiological attributes of food products. Recognizing the economic potential that cheese production brings to south-west Serbia, the United States Agency for International Development (USAID) partnered with the Czech Development Agency in 2013 through the Emerging Donor Challenge Fund to help the centre become a modern facility offering a range of services to the farmers. The Czech Development Agency provided funds to equip the lab, and USAID trained and educated staff on ISO standards and required testing procedures.



Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.2

Gender Equality

Currently, there are a limited number of good practices enhancing the role of women in the production system. In some cases, women represent a high percentage of the workforce, but often men continue to be the

decision makers and women are excluded because of the absence of equal rights (property or decision-making). Only a few cases recognise the role of women, through their incorporation in the value chain ensuring equal wages and conditions (e.g. the case of Ternasco de Aragón).

Role of women: Ternasco de Aragón lamb meat (Spain)

The role of women in sheep farming operations has gained importance during the last decade. There is a progressive incorporation of women, in administration as well as farming tasks. In recent years, the number of farms owned by women has significantly increased.

Role of women: Ternasco de Aragón lamb meat (Spain)

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Association Board membership

The representativeness of the supply chain in the consortium depends on the complexity of the value chain and, consequently, on the complexity of the management structure (consortia, associations or inter-branch organizations). In some cases, there are simple governance structures that define the production rights of farmers and sales methods. In other cases, where the value chain includes heterogeneous actors, more complex governance structures facilitates the

co-operation and organized management of different levels of the supply chain (Comté case). Actors in the value chain can be members of these associations/consortia/inter-branch organizations as individuals or as members of a union. In some cases, only producers have the right to vote in the assembly, while other actors have an advisory role. In other cases, supply chain actors are represented in a board: in a percentage proportional to the quantity of product put into the supply chain at province or regional level.

Representativeness of the supply chain in the consortium: Comté cheese (France)

Representativeness in the Comté supply chain is ensured through a system of four College (groups) which represent different stakeholders in CIGC (the key entity in the governance of the Comté PDO).
College 1: Milk producers are represented by farmers.
College 2: Cooperative cheese manufacturers are represented by their own union (FDCL, French Federation of Dairy Cooperatives, at department level) and they take care of the processing of the Comté cheese.

College 3: Processing (manufacturing and ripening) and production stakeholders are represented by their own unions (FNIL, French National Federation of Dairy Industries for non-cooperative cheese manufacturers and CEC, Enterprise Chamber for Emmental and Comté, for ripeners).
College 4: Ripeners and packers are represented by FNIL and CEC.
Articulating the Comté value chain into 4 different groups enables farmers and non-farmers to cooperate and manage their work in an organized way, while the CIGC provides transparent information to every unit.

Relevance of co-operatives

In most GI production systems, agricultural cooperatives play a key role, being directly involved in organizing producers and marketing and commercial activities. In some cases, cooperatives play extensive roles, such as influencing the adoption of PDO/PGI certification, managing knowledge transmission, providing technical

and information services, identifying marketing opportunities, and dealing with brokering activities (case of Hom Mali rice). In other cases, co-operatives play more focused roles, such as monitoring and ensuring farms and production facilities are in full compliance with the CoP, or helping farmers to deal with common day to day problems.

Role of cooperatives in the supply chain governance – the case of Hom Mali rice (Thailand)

Agricultural cooperatives are one of the key stakeholders in Hom Mali rice production in Thung Kula Rong-Hai (TKR) together with rice mills and other rice processors. Being a member of an agricultural cooperative influenced the adoption of GI TKR Hom Mali rice certification. One of the most important roles of the cooperative is scanning for information on potential GI rice farmers and selecting collaborative partners, namely rice farmers group, millers, regulators, and technical

service providers. Second, agricultural cooperatives manage knowledge processing by providing technical and information services to producers. A third good practice is gatekeeping and brokering, an important role for trading and collaborative deals of certified GI products. Fourth, cooperatives are involved in product testing and validating: in procuring paddy from farmers, the agricultural cooperatives have to ensure that they are registered GI farmers. Lastly, cooperatives play a key role in commercialization: the marketing and sales through agricultural cooperative networks help to identify market opportunities and ensuring steady demand.

Distribution of bargaining power

The distribution of bargain power depends on two factors: the sustainability of the supply chain structure (see case of Parmigiano Reggiano) and the management of sustainable issues (e.g. case of Phú Quốc). The sustainability of the supply chain structure can be enhanced by institutions or co-operatives that define rules, guarantee product quality, and monitor the respect of GI processing standards. These actors can also guarantee investments in innovation to combine new technologies with the tradition of the GI, facilitating a generational renewal, and deal with the promotion of the GI abroad. Another important factor that supports the sustainability of the supply chain is territorial cohesion. Networking between local stakeholders enables better response to the market, to the demands

of technological innovation, and to agricultural policies. A second key factor is the management of sustainability issues. This can happen at the company level or at collective levels. In general, when supply chain members are mainly private actors, sustainability issues are managed individually by companies. In these cases, issues tend to be discussed at board level. In other cases, members with specific expertise, and with no conflicts of interest, help facilitate the process. When there is a Consortium, the management is both individual and collective. On one hand, general sustainability aspects are managed collectively through the Consortium and are defined in the CoP; on the other hand, each farm organizes its own production system, respecting the production rules of the CoP. That allows each producer to introduce innovation within the CoP framework.

Sustainability of the supply chain structure: case of Parmigiano Reggiano hard cheese (Italy)

The structure, the organization of production, and marketing strategies of Parmigiano Reggiano foster the sustainability of the supply chain. This can be considered a result of a process where actors with different interests

combine in a functional equilibrium. The structure of the Parmigiano Reggiano chain and the relationships between the various actors in the system of Parmigiano Reggiano means that they operate and interact along the value chain, and inside and outside the production area. Production is just one of the components within the system of Parmigiano Reggiano; this is supported

Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.2

by other actors with institutional functions, such as researchers and consultants, technical assistants, input suppliers for breeding farms and dairies. The production and trade components consist of farmers, dairies and traders/ ripeners. The manufacturing/trading system

is also composed of the Consortium of Parmigiano Reggiano and other public and private institutions that actively contribute to increasing the transparency of the system.

Individual or collective management of sustainable issues: Phú Quốc fish sauce (Vietnam)

In the case of Phú Quốc, sustainability issues are managed collectively. The group consists of five members from the Department of Fisheries, the Division of agriculture and rural development, and three

standing members who have expertise and experience and receive a salary without pressure or conflict of interests with producers. However, in other cases, they are managed individually by companies, as in the case of Ternasco de Aragón (lamb meat, Spain), where discussions regarding sustainability issues occur at the Executive Board of the Regulatory Council.

Fair marketing management

To support the economic sustainability of FQS value chains, marketing strategies (see case of Kafae Doi Chaang) and product segmentation are important practices. The main marketing strategies concern multi-channel strategies to make GIs more accessible and convenient for consumers: sales through online shops, home delivery or restaurants. Another marketing strategy is to focus on advertising on TV, radio, printed media and online channels. In some cases, GI consortia publish information pamphlets and books of recipes to popularize the use of the GI. Finally, the dissemination of information

about GIs in schools and educational channels is another marketing strategy to increase young people's identification with local products. Product segmentation is a strategy aimed at reaching more consumers and increasing the value of products. Three different strategies are common in GI chains. First, the product is introduced as an ingredient in processed food in a co-branding scheme (e.g. Parmigiano Reggiano and McDonalds signed an agreement to use the cheese in the Parmigiano Reggiano burger). Second, new packaging is introduced to allow a longer shelf-life (e.g. vacuum packaging). Third, the product is sold in new cuts or as a convenience food (ready-to-eat).

Marketing strategies: Kafae Doi Chaang coffee (Thailand)

A good strategy is that of diversifying sales channels. Kafae Doi Chaang introduced new sales channels to reach consumers directly and invested in multiple

channels to provide consumers with more convenient access to the product, such as coffee shops, online shops, and delivery services. In addition, an important marketing strategy is that of educating domestic consumers about GI and fairtrade certifications.



Short supply chain organization and management

Direct sales can be an important and rewarding channel especially for small and independent producers, who

find it difficult to place their products in large stores. In GI value chains, direct sales can be supported in different ways through a marketing strategy organized by consortia or associations which serve all producers (e.g. Parmigiano Reggiano case).

Direct sales: the case of Parmigiano Reggiano hard cheese (Italy)

Small dairies, often independent ones, have improved their value chain by virtue of their farm shops offering direct sales to consumers. They have often expanded their sales, at the expense of dairies, with no direct selling and outlet for consumers. Shops do not exclusively

offer GI products, but also gadgets and gifts. Parmigiano Reggiano is often bought as a gift, so accoutrements, such as special cheese knives, are often sold with it. Logistically, direct-to-consumer dairies are supported by the Consortium. The latter supplies a standard uniform for sellers, coordinates the supply of technology, skills and assistance, and helps the stores to comply with health and safety, as well as labelling and traceability regulations.

Supply control and value creation

In GI value chains, strong variations in stocks and production can negatively affect product quality, investments and the transmission of know-how. In order to respond to these challenges, in some cases productive

quotas are introduced as a tool to control supply chain and create value (e.g. Moules de bouchot case). Quotas are introduced by consortia or national legislation, to prevent overproduction, to limit the degradation of natural resources, and to protect product quality.

Production quotas: the case of Moules de bouchot (seafood, France)

The Moules de bouchot CoP specifies numerous regulations on distribution, density and seeding rates. These regulations are necessary to prevent overproduction and to protect the quality of the watershed. They concern distribution and density of bouchots (a traditional aquaculture technique for

mussels), which are limited to 110 bouchots per line of 100 linear meters in the East, and 140 per 100 in the north-western area. The seeding rate is fixed at 65% per line of 100 linear in the East and 55% per line of 100 in the rest of the farming area. The duration of farming ranges from a minimum of 11 consecutive months to a maximum of 24 months, and the total quantity of mussels per bouchot is established to a maximum 60 kg per pilings.

Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.3

3.3 Use of Natural Resources

Determinants that impact on the “use of natural resources” are: (i) animal welfare, including aspects concerning animal health and animal freedom from stress; (ii) quality of resource exploitation, indicating good practices to guarantee the respect of the

qualitative aspects of resource exploitation; (iii) carbon footprint control and management; (iv) water quality creation and management; (v) respect for biodiversity, including ecosystem diversity, species diversity and genetic diversity; (vi) protection of soil quality. Each of these factors is described below.

Animal welfare

Animal welfare is articulated in terms of animal health (see Comté cheese example) and freedom from stress (e.g. case of Gyulai Kolbasz sausage). Both elements are protected by codes of practice. Good practices concern breeding and feeding of animals; the origin of forage (area of production and supplier of animal feed

are regulated); the quality of fodder (fermented fodder or GMOs are not allowed); the limitation to the use of antibiotics; grazing outside whenever possible; the control of the livestock rate. These elements represent a positive improvement in the care of animal health and physiology. Furthermore, good practices to reduce animal stress regard transport and slaughter mechanisms, which are aimed at minimizing animals’ anxiety and suffering.

Animal health: the case of Comté cheese (France)

In the CoP there is a section of regulations for breeding and feeding of dairy cows, including a requirement that cows must be outside whenever possible. These regulations are a clear statement of the attention paid to the animal welfare. There are also strict regulations on forage, which must come from the PDO area. No more than 1,800 kg of concentrates per lactating cow and per year are allowed. No fermented fodder (silage) or GMOs are allowed.

Animal freedom from stress: the case of Gyulai Kolbasz sausage (Hungary).

Protection of animals is guaranteed by the provisions of the regulation 1099/2009/EC. Operators and slaughterhouse staff take the necessary measures to avoid and minimize the anxiety and suffering of the animals during the process of slaughter, considering best practices in the sector and the methods allowed by 1099/2009/EC regulation.

Quality of resource exploitation

Quality of resource exploitation is indirectly guaranteed by the CoP. In some cases, the CoP regulates seed species and quality, the distribution, density and seeding rates (to prevent overproduction) as well as harvesting

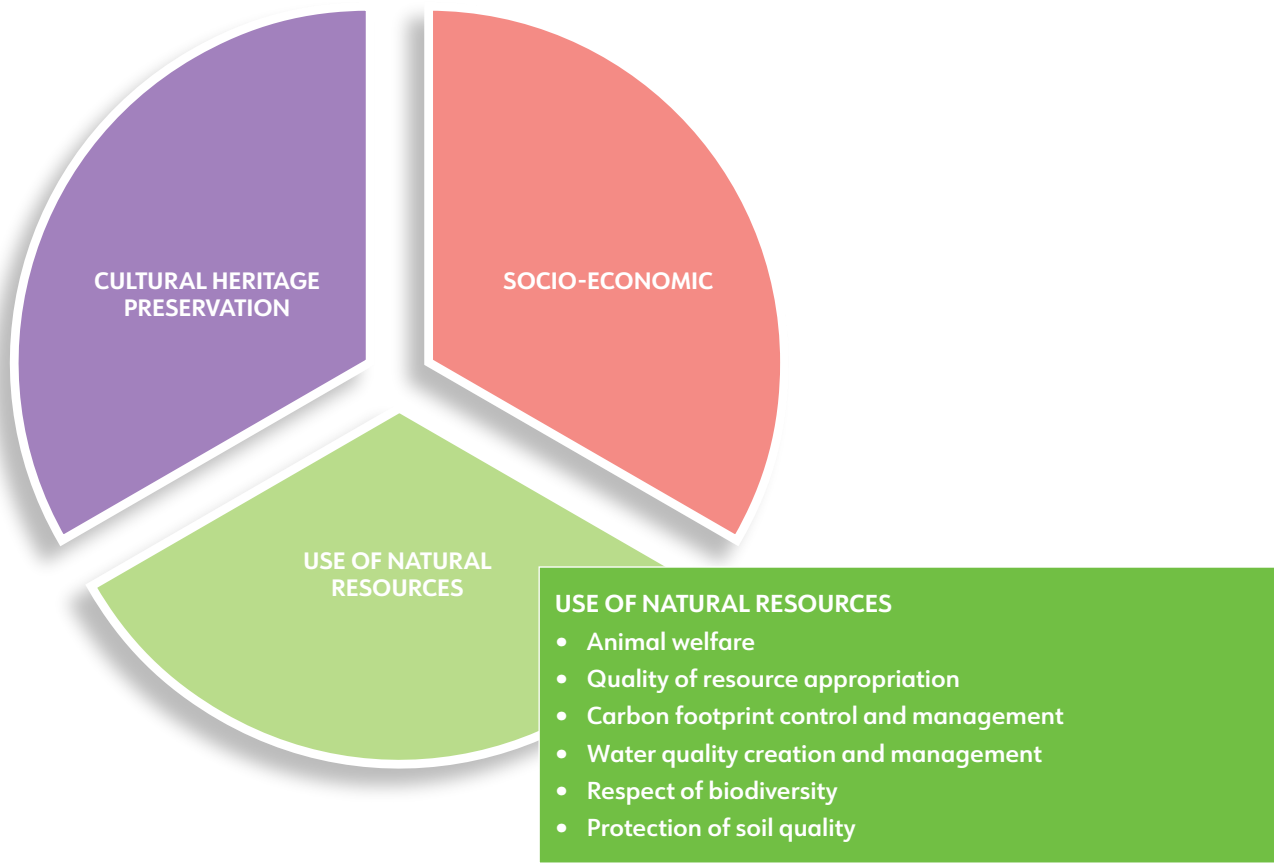
methods. In other cases, it protects autochthonous breeds or species and traditional extensive production systems, which can conserve landscapes and contribute to the conservation of natural resources, as in the example of Buon Ma Thuot coffee.

Quality of resource exploitation: Buon Ma Thuot coffee (Vietnam)

Buon Ma Thuot coffee complies with all CoP regulations, some of which concern resource exploitation. Seedlings of Buon Ma Thuot coffee must be of the Robusta species

and come from permitted stores. In addition, coffee cherries must be harvested by hand and must be ripe when harvested, and transported to the processing facility within 24 hours. Transportation and packaging have to be clean.

3.3 Use of Natural Resources



Carbon footprint control and management

No direct action is currently being taken to manage CO₂ emissions. However, good practices enabling lower emissions of CO₂ exist (e.g. Opperdoezer Ronde potatoes). The shorter distance travelled by raw materials from the area of origin, and shorter sales distance due to direct sales, decreases the amount of emissions linked to transportation. More sustainable production

methods require lower use of energy for soil and plant preparation. Animal dietary composition also impacts upon CO₂ emission. Healthy diets increase the lifetime of cattle, which lessens the “carbon deadweight” of unproductive heifers and cull cows; moreover, cattle are fed with specific forage which requires less fertilizer and less fuel for field operations than the amount required by silage maize.

CO₂ emissions management: the case of Opperdoezer Ronde potatoes (The Netherlands)

Compared to the adjacent region IJsselmeerpolders, the Opperdoezer Ronde has a slightly higher carbon footprint (84 and 65kgCO₂e per tonne respectively). However, thanks to the shorter growing period than

regular consumption potatoes, the PDO reduces the use of fertilizers, as well as diesel for cultivation and electricity for storage. Furthermore, the Opperdoezer Ronde is not exported, so transport is limited to local distribution (from the farms to the distributing company and from J.H. Wagenaar to retailer’ distribution centres and local shops). For this reason, CO₂ emissions in this area are drastically lower.

Learning from Practice: Comparative analysis of sustainability among FQS case studies: key messages

3.3

Water management

Most of the good practices aimed at water quality management concern: lower usage of pesticides and

herbicides in crops; lower quantity of water use and absence of irrigation systems where rainfall is sufficient (see case of Kafae Doi Chaang). Most actions are in fact geared towards reducing water use, while specific actions related to quality are lacking.

Water management: the case of Kafae Doi Chaang coffee (Thailand)

Producers manage water use, particularly in the pulping and washing process, by recycling it and treating it in order to prevent environmental pollution. The pulp

is conveyed using conveyor belt to avoid pulp-water contact. For every fermentation phase, sieves are used to separate solid particles and eliminate suspended organic matter. In addition, the Kafae Doi Chaang Company reuses water from wastewater treatment, so that the volume of water used is lower.

Respect of biodiversity

GIs are linked to the territory and ecosystem characteristics, and consequently production practices should respect these conditions. Good practices refer to production systems with low use of herbicides or chemical fertilizers, which support the biodiversity of flora, the conservation of different kinds of seeds, and the maintenance and promotion of indigenous breeds.

This ensures the conservation of the landscape and biodiversity in areas where GI registered animals graze. Good practices also include research projects to manage grassland biodiversity or national programs to preserve and promote breeds. Finally, there are also schemes for individual identification of animals, pedigree information and specific conservation programs based on continuous exchange of genetic material across herds to reduce inbreeding (e.g. Buon Ma Thuot coffee).

Respect for eco-system, species, and genetic diversity: the case of Buon Ma Thuot coffee (Vietnam)

The FQS has strict rules on farming practices to preserve biodiversity. Badly damaged land must lie fallow for at least three years, and the soil has to be cleansed of

all possible pathogens before replanting. Moreover, there is a low amount of waste in green production as coffee cherries must be harvested only when ripe. Coffee pulp, husks and plant residues from previously grown coffee are used to make compost. The CoP also states that shelterbelt trees and shade trees can be grown simultaneously or before planting coffee.

Protection of soil quality

Many CoP establish practices and rules on soil management (see case of Hom Mali rice). These include: the use of shading systems, in order to maintain more regular levels of soil and leaf temperatures; soil preparation before farming; the use of manure rather than mineral fertilizer; the use of fodder and grassland

as forage in breeding farms; and the definition of a maximum livestock rate and grazing. In some cases, cooperatives and auditors assess the parameters and supervise the respect of rules. To avoid land degradation, some CoPs include agricultural rules. These can ban harvesting on destroyed land for three years and impose cleaning measures for soil before it is replanted. In other cases, a rotation scheme can be adopted to prevent soil fatigue.



Practices to assess and guarantee soil quality: the case Hom Mali rice (Thailand)

In order to guarantee soil quality, the consortia imposes CoP regulations which state that, before cropping, the

land must be prepared according to specific technical rules. For example, the land has to be levelled and weeds eliminated and the planting season can run from April to August.

Recommendations for Action

The good practices identified in the previous sections are not a universal solution to the challenges of managing FQS and public goods. They do not represent a static system of practices to follow. Rather, establishing good practices is a dynamic process which considers the emergence and adoption of new practices, their management and evolution over time. Instead of recommending a rigid collection of practices, we envision five steps to establish case-by-case what are the best practices for managing public goods connected to FQS.

1. Identifying the type and characteristics of public goods generated by the production system.

The Codes of practice and operating rules issued by Consortia and Associations are very often inspired by traditional production practices, and are aimed at guaranteeing a certain type of quality of food products. For this reason, the presence of externalities and associated public goods is often taken for granted, and there is little awareness of what kind of public goods are generated or their characteristics. Being aware of the contribution that the production system makes to society and the local area is the starting point of a process of territorial qualification, which is important for maintaining and, if possible, improving the public goods produced over time.

2. Identifying the determinants of public goods.

Identifying the driving factors (determinants) that generate public goods helps clarify which aspects need to be monitored over time. Public goods should be protected from technological pressures (see animal welfare and biodiversity) and monitored over time.

3. Understanding how to manage and enhance public goods over time.

The characteristics of the public goods generated, however, are not constant over time as they are linked to production choices. The management of production specifications influences the characteristics of the public goods generated, their lifespan and evolution over time. Advance planning for intervention, considering the effects of government action on the production system both at the central (the Consortia) and at producer levels effectively contributes to an efficient management of public goods. This benefits all the actors of the local production system, including local communities.

4. Identifying stakeholder commitment in generating public goods.

The creation and maintenance of public goods requires action and not merely window-dressing or “greenwashing”. Only through an explicit commitment and assumption of responsibility towards public goods creation do economic agents in the supply chain become the “protagonists” and “guarantors” towards the community.

5. Assessing the feasibility of good practices that generate public goods.

It is necessary to assess whether production and management practices are actually feasible, from a technical, economic and political point of view. It is important to be aware of the limits that good practices aimed at obtaining new categories of public goods can bring over time. This phase requires the contribution of actors both internal and external to the supply chain and, sometimes, to the production area.

6. Regularly assess the progress towards more sustainable practices.

Finally, it is important to regularly assess progress towards more sustainable practices through a relevant subset of indicators (in Part 2 we described a possible method to do so). The analysis of the good practices evident in the FQS, to strengthen sustainability, leads to the following recommendations for each class of PG.



Recommendations for Action

4.1 - 4.2 - 4.3

4.1 RECOMMENDATIONS ON CULTURAL HERITAGE PRESERVATION

1. Developing relationships (technical/commercial and social) along the supply chain at territorial level

The development of place-based relationships that include both technical-commercial and social elements gives visibility to actors producing food products and generating associated public goods. Relationships help to share responsibilities and give a special role to people in the territorial system. The aim is to develop a relationship of trust that contributes to generating a positive reputation and value for the benefit of the entire territory.

2. Creating a sense of belonging and identity that links producers to the territory

At the same time, the sharing of values between local actors becomes a determinant of a sense of belonging and connection among the actors of the supply chain and local citizens. These feelings become elements of identity not only of the product, but also for the entire local population, which directly and indirectly supports and benefits from production.

3. Communicating the cultural, historical and traditional characteristics of the product

Communication of the characteristics and effects generated by public goods is an important aspect of the overall enhancement process of the production system. It has the effect of generating consumer awareness of the real quality attributes linked to the GI food product. The communication process must take place both within the supply chain and between the supply chain and consumers/citizens inside and outside the production area.

4. Organizing educational and training activities that encourage generational change

Although good practices are usually well known among operators, it is important to ensure that they can be maintained over time between generations. Training activities are important for agents who are already part of the supply chain, and also particularly for those who are new to the world of GIs, in order to prevent cultural barriers forming within the territorial system.

5. Organizing cultural, touristic and promotional events

A CoP shared and managed by people who embody the link between humans and territory gives transparency to GI production systems. It is thus important to promote the products and public goods associated in communications and from an experiential point of view. This can be achieved through the organization of cultural events, attracting tourists, and organizing study visits to the production facilities area covered by the CoP.

6. Monitoring the minimum and maximum profitability of the processes

All activities must appear in accounts in order to enable economic assessment of costs of producing public goods. Accountability systems relating to "social budgets" provide the community and stakeholders with the size, impact and therefore the value of the public goods generated.

4.2 RECOMMENDATIONS ON SOCIO-ECONOMIC ASPECTS

1. Using a collective and participatory approach

In the definition and management of good practices that generate positive externalities, a collective approach to sharing the process between actors in the supply chain and between local stakeholders is important. The aim is to prevent discrimination, and create a sense of belonging and awareness among all actors involved.

2. Preventing concentration of economic and decision-making power.

Sharing between the economic and social actors on the GI value chain is important, and it is essential to prevent concentration of decision-making processes. The aim is to avoid opportunistic mechanisms in the supply chain and advantages for a minority of members.

3. Consider gender equality in decision making processes and economic aspects

Since participation and sharing of public goods for the production system and for the area, gender equality must become an operating principle within the decision-making process. It adds a further element of enhancement and distinction to the production system.

4. Developing governance actions for the management of the supply chain and markets

Actions that lead to the generation, communication and enhancement of public goods linked to GI products must be managed through coordinated governance between the actors in the supply chain, in collaboration with local stakeholders.

5. Developing external governance actions to create networks with private and public institutions

Governance actions impact upon supply chain members, and also on all institutions related to the production system in political-institutional, economic, commercial, technological and research aspects. Developing and maintaining relations with these institutions, both local and non-local, enables local policy makers to keep within close proximity to current trends and be in constant communication, which in turn helps the definition of appropriate legislative measures and forms of governance.

4.3 RECOMMENDATIONS ON THE USE OF NATURAL RESOURCES

1. Creating a balance between technology and traditional practices to preserve natural resources, landscape, biodiversity

The use of technology is the most effective method to improve efficiency of the production system, but at the same time technology can break the link between humans and the environment, with often unanticipated negative externalities. For this, it is important to adopt technologies that do not damage the environment or challenge natural balances. In this sense, many traditional practices of FQS can constitute a source of inspiration for sustainable practices.

2. Adopting extensive production systems in livestock and agriculture, to maintain the presence of labour and to respect the biophysical limits of the environment.

Extensive production systems favour the respect of biodiversity, eco-system sustainability, and landscape, and at the same time ensure the presence of skilled labour in traditional production processes.

3. Developing research systems for monitoring sustainability issues

The sustainable use of natural resources must be accompanied by research with the aim of analysing and monitoring environmental sustainability and studying potential innovations. A network of research centres, universities, and public and private institutions is recommended.

4. Communicating the benefits of environmental public goods to citizens

It is important for citizens to be informed of environmental public goods generated by FQS in order to raise awareness of the positive impact of FQS value chains on the territory. This allows a greater integration between the supply chain and citizens, who enjoy the positive externalities produced in terms of environmental sustainability.

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