



**PEGASUS**  
Public Ecosystem Goods and Services from  
land management – Unlocking the Synergies

**D 3.3**

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**TRANSFORMING  
APPROACHES TO RURAL  
LAND MANAGEMENT**

Stimulating long-lasting  
improvements in the  
delivery of social, economic  
and environmental benefits  
from EU agricultural and  
forest land

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**Socio-political, economic and institutional drivers. A cross-country comparative  
analysis. Synthesis Report**



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## Executive summary

The objective of this report is twofold:

1. First it investigates the range of drivers and factors that have an influence on the provision and delivery of environmentally and socially beneficial outcomes (ESBOs<sup>1</sup>) in different countries, to help explain the differentiated provision experienced in different situations. This includes looking at regional/local institutions, market drivers and relevant associations and partnerships.
2. Second, it aims to identify the types of policy instrument that play a major role in providing the necessary conditions to stimulate or permit collective or other innovative action by farmers and foresters in relation to ESBO provision (e.g. regulatory framework, financial support, climate for enabling action).

The report is based upon a review of these two elements in ten Member States in which case studies for the PEGASUS project are being carried out. Some 34 case studies have been reviewed in these countries for identifying the main **market, social and institutional drivers** which influence the provision of ESBOs (PEGASUS Deliverable 3.1)

The first section of this report briefly sets out **the main characteristics of the case studies and the main environmentally and socially beneficial outcomes that are the focus of investigation in these areas**. The provision of these ESBOs is strongly related to the characteristics of the natural resources and farming/forestry systems in the region concerned. In the PEGASUS case studies, the predominant ESBOs investigated in extensive agriculture/livestock areas are biodiversity and landscape, while in intensive agricultural/agri-industrial areas there is a more evident emphasis on water quality and availability (combined with landscape/soil). In other farming/forest systems, the focus on ESBOs is more generic: for example in initiatives involving a networks it is hard to identify any predominant ESBOs although social benefits are often the focus of such initiatives. In forest areas, the ESBOs investigated typically relate to several dimensions (flood protection, water quality and quantity, biodiversity, landscape and outdoor recreation, carbon sequestration, etc.).

The report shows that the issue of scale for the production and the delivery of ESBOs in the sense of geography or territory is very relevant in natural resources policy and management. Geographical scale has two relevant implications: first, on the types of ESBOs that are sought and prioritised and second on the relevant actors promoting initiatives, either individually or collectively. Looking at the PEGASUS case studies, about half (17) operate on a small scale, a third (11) on a medium-large scale, and the remaining ones (6) on a national/regional scale.

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<sup>1</sup> 'Environmentally and socially beneficial outcomes' (ESBOs) are those outcomes in the environmental and social spheres that are delivered by agriculture and forestry and which benefit society. This term thus includes:

- Ecosystem services, and their resulting benefits, that have public goods characteristics (environmentally beneficial outcomes), and;
- Social and cultural outcomes delivered by farming and forestry with public goods characteristics

The market drivers that are mainly found in the PEGASUS case studies have been classified into two main types: (i) drivers linked to the demand for sustainable food (such as organic, integrated, health food) and (ii) drivers linked to certification schemes that farms and agri-food firms may adopt to differentiate their products. These drivers show how the provision of ESBOs cannot be explored and analysed only by looking at the production dimension, since the relationship that holdings have with downstream actors, particularly with the processing industry, retailers, the public sector as well as with final consumers are very important aspects to be considered.

The main social, cultural and institutional drivers that can be considered relevant for enhancing the provision of ESBOs have been sorted in three typologies: (i) social and cultural dynamics, (ii) institutional change and (iii) demand for leisure/recreation, health and education. The main features of the three typologies of drivers are briefly discussed, showing that in order to analyse the provision of ESBOs through farming and forestry it is necessary to look beyond the strategies of farmers, foresters and agri-food firms, and examine in more depth the social, cultural and institutional settings in which they operate.

With regard to **the role of public policies**, the report presents a critical reflection on the policy mix affecting ESBO provision in the different socio-economic and institutional settings.

Policy instruments and measures have been divided into three broad categories: (i) policy support with direct focus on the ESBOs, (ii) policy support with indirect focus and (iii) policy support with direct focus on rural vitality, where this ESBO is considered relevant.

The PEGASUS project applies a Social-Ecological System (SES) framework, derived from the McGinnis-Ostrom (2014) framework, for the analysis in the 34 case studies. In a given social and ecological system (SES), there is always a mix of different policies, operating at different levels which may contribute directly and/or indirectly to enhancing the provision of ESBOs. In some cases, the policy mix may be incoherent or insufficient to trigger action by land managers. Different policies use different mechanisms to steer action by farmers/foresters: they may set regulatory rules/standards requiring compliance or take the form of economic incentives encouraging the adoption of more sustainable practices. The mix of relevant policies and regulatory framework at territorial level is strongly conditioned by the type of socio-ecological system. As a result, and to ensure a detailed analysis could emerge from this report, we have focused on examples of three main types of socio-ecological systems: intensive agri-industrial, extensive agriculture and forestry areas and peri-urban areas. The report reviews three different case studies representing three examples of SESs with different mixes of policy instruments which influence ESBO delivery: an intensive agri-industrial area in Italy, an extensive Landscape Protected Area in Czech Republic; and a peri-urban forest in Slovenia.

The report also shows that public policies are not the only instruments driving the provision of ESBO. A number of PEGASUS case studies focus on **market-based policy mechanisms**; they can be classified in four categories: (i) premium price payments; (ii) compensations for additional costs and income foregone; (iii) certification schemes and (iv) projects/initiatives combining nature

conservation and economic development objectives (Integrated conservation and development projects or ICDPs).

The analysis of the literature and of the PEGASUS case studies confirms that the different schemes can play an interesting role in the provision of ESBOs. The key points emerging from this analysis are as follows:

- Private schemes in different territories are often combined with public ones;
- Private schemes which in some cases are associated with private Payments for Ecosystem Services (PES) provide evidence of a societal demand for the delivery of some ESBOs. In fact, private schemes respond to civil society demands for the sustainable use and management of natural resources, biodiversity conservation and social cohesion;
- The ability to set better contractual agreements within the supply chain and between producers and final markets is a crucial variable emerging as a key to success both in PES and in certification schemes.

Finally, the effectiveness of both regulating public policies and market-based mechanisms is highly dependent on **institutional and governance settings**, some of which are innovative, and on the different ways in which public and private actors cooperate in promoting and delivering ESBOs. In the report the main characteristics of action found in the PEGASUS case study initiatives are briefly discussed. They can be collective or individual. The criteria identified in the literature have been reviewed and expanded to better explain the different forms that collective action can take. Four types of actions are identified, as follows: a) individual action; b) collective action-public policy driven; c) collective action-private actors driven; d) collective action-public/private partnership driven.

## 1 Introduction and objectives of the Report

This report aims to summarise the main findings of the research carried out as part of PEGASUS project's Work Package 3 (WP3).

The main objectives of WP3 are as follows:

- a) Studying regional/local institutions, market drivers and relevant associations and partnerships, under the hypothesis that the diffusion of various forms of associations and local partnerships (either private or public-private) involving farmers and forestry producers and also civil society in rural areas is relevant to explain the differentiated provision of ESBOs across countries;
- b) Studying policies (environmental, agricultural, rural and regional) to achieve a specific overview of which types of policies have a major role in providing the necessary conditions (e.g. regulatory framework, financial support, climate for enabling action) to stimulate or permit collective actions by farmers and foresters.

This report represents the deliverable D.3.3., including findings of both tasks 3.1 and 3.2. It is based on ten country reports and on the analysis of the main literature dealing with policies and institutions involved in the provision and delivery of environmentally and socially beneficial outcomes (ESBOs). National reports also gathered information from interviews with relevant stakeholders. The main findings of this report thus derive from the current knowledge of 34 case studies representing different European settings, both in terms of farming and forestry systems and institutional context. The complete list of case studies and the principal variables used for classification in in Annex 1 of this report.

The report is structured in seven chapters:

- After this introduction, the second chapter briefly presents the main characteristics of case studies (main ESBOs involved, farming systems, territorial scale, etc.);
- the third chapter explains which are the main drivers (market, social and institutional) that should be considered as influencing the provision of ESBOs;
- the fourth chapter presents a critical reflection on the role of public policies and the policy mix affecting ESBO provision in the different socio-economic and institutional settings;
- the fifth chapter summarises the most relevant market-based mechanisms which operate with or without public policies (but very frequently with an initial public policy impulse);
- the sixth chapter discusses institutional and governance innovations and the different ways in which public and private actors cooperate in promoting and delivering ESBOs;
- the seventh chapter draws the main implications from this analysis on the use of the social-ecological systems (SES) approach and for the selection of the PEGASUS in-depth case studies.

## 2 Key PEGASUS case studies and typologies of ESBOs

This analysis is strongly linked to the findings of ten country reports (D3.1 of the PEGASUS project), where 34 case studies have been used as examples for the analysis of market, social, institutional drivers in the country. The case studies have been chosen to reflect the strong diversity of farming and forestry systems in the EU. The case studies do not necessarily represent the full range of ESBOs provided by agriculture and forestry in the EU, therefore the tables below can obviously not be considered as being a representative sample of the public goods and ecosystem services in the different countries. The 34 case studies and associated ESBO characteristics will be explored in more depth in the next steps of the PEGASUS project. Almost half (16) of the PEGASUS case studies represent extensive forms of agriculture and livestock (table 1). One fifth (7) of the case studies are examples of intensive agriculture or agri-food systems, the latter identifying a strong presence of the food industry within the territorial supply chain. There are also four cases of specialised forest areas and two cases of peri-urban agricultural/forestry areas. The last group of case studies includes five examples of network/short supply chain initiatives, or ‘alternative farm networks’ (following the definition of Lamine *et al*, 2012), either based on organic farming (three cases) or other sustainable forms of agricultural/forestry production. Farmers/foresters belonging to this group have no particular common geographical origins (territorial shared characteristics), being scattered across the regional/national scale. They could represent new forms of governance of farm/forestry relations reaching beyond specific territories and having in common sustainable production in the same markets.

**Table 1 – Case studies by type of farming systems in the PEGASUS sample**

Type of areas	Number of cases	%
Alternative network of farms	5	15
Extensive agriculture	8	24
Extensive livestock	8	24
Forest area	4	12
Intensive agriculture	2	6
Intensive agri-industry	5	15
Peri-urban area	2	6
Total case studies	34	100

*Percentages do not add up to 100% due to rounding*

In terms of the ESBOs focussed upon in the case studies, their significance or relevance within the case study area strongly depends on the characteristics of natural resources and farming/forestry systems. In the following tables, we have selected the most relevant ESBOs mentioned in the national reports for each case study, i.e. the priority ESBOs in the systems examined. This required some form of simplification, which seems necessary at this stage to explore the main relations between the socio-ecological systems, their institutional arrangements and ESBOs. In extensive agriculture/livestock areas the initiatives are mainly focused on biodiversity and landscape as a fundamental pair of relevant ESBOs (table 2). Extensive agriculture or livestock are typical systems

found in less developed rural areas, which are generally characterised by a rich biodiversity and a greater need to foster rural vitality.

**Table 2 - Priority ESBOs in PEGASUS case studies, by type of farming systems**

The most relevant ESBOs	Typologies of farming system					Total case studies
	Alternative network of farms	Extensive agriculture and/or livestock	Forest area	Intensive agriculture/agri-industry	Peri-urban area	
Biodiversity and healthy soils				1		1
Biodiversity and landscape	1	9				10
Biodiversity and outdoor recreation			1			1
Biodiversity and rural vitality		1				1
Landscape and animal welfare				1		1
Landscape and outdoor recreation					1	1
Multiple ESBOs	3		2			5
Public recreation, education and health	1		1			1
Rural vitality and landscape		4		2	1	7
Water and flood protection		1				1
Water and landscape		1		2		3
Water and soil functionality				1		1
<b>Total case studies</b>	<b>5</b>	<b>16</b>	<b>4</b>	<b>7</b>	<b>2</b>	<b>34</b>

In intensive agricultural/agri-industrial areas there is a more evident emphasis on water quality and availability (combined with landscape/soil), while in other types of areas the focus on ESBOs is more generic: in alternative farm networks it is hard to identify main ESBOs, as they are not linked to a specific territory; ESBOs that are the focus of case studies in forest areas, instead, typically cover several dimensions (flood protection, water quality and quantity, biodiversity, landscape and outdoor recreation, carbon sequestration, etc.).

The issue of scale for the delivery of ESBOs in the sense of geography or territory is very relevant in natural resources policy and management. Geographical scale has two relevant implications: first, for the ESBOs involved and second for the relevant actors promoting initiatives, either individually or collectively. Public policies are only to a limited extent designed at the appropriate scale; being generally space-blind and independent from specific scale (except for Leader and Leader-like approaches, or some limited experiences in agro-environmental partnerships). Looking at the specific literature on agri-environmental public goods and collective actions (OECD, 2013; Davies et al, 2004), some interesting reflections on scale issues can be summarised as follows:

- the characteristics of natural resources are crucial to define the natural unit for achieving ecological management objectives;
- there must be a good compromise between the advantages of the “locality” (local ownership, control, accountability, sensitivity to context) and the boundaries of an effective management unit. This does not necessarily mean that small scale is always preferable over a larger scale;
- collective actions make it possible to deliver public goods characterised by a large geographical scale, that could not be provided or protected by a single farmer;

- in conclusion, there is no single criterion regarding the appropriate scale for managing initiatives on ESBOs, but ecological and social networks/cooperation appear the most relevant variables influencing the choice.

Looking at the PEGASUS case studies (table 3), we can see that about half (17) operate on a small scale, a third (11) on a medium-large scale, and the remaining ones (6) on a national/regional scale, essentially because they relate to extended farm/forestry networks. Peri-urban cases are all of small scale, while intensive and extensive systems are equally distributed between small and medium/large scales (table 3). In terms of the main ESBOs concerned, and although this is being developed in the case study work, a preliminary analysis shows that small scale case studies tend to focus mainly on biodiversity and landscape; medium-large scale initiatives mostly on rural vitality, landscape and water; national-regional scale cases on multiple ESBOs. The larger the scale, the harder it is to achieve a clear definition of the ESBOs involved. This is because, as the scale increases, the interactions between the ESBOs become more complex and the number of actors to be considered increases as well.

**Table 3 - The geographical scale in PEGASUS in the different rural areas (number of case studies)**

Typologies of areas	Local: small scale	Local: medium/large scale	National/regional scale	Total cases
Alternative network of farms			5	5
Extensive agriculture and/or livestock	9	7		16
Forest area	2	1	1	4
Intensive agriculture/agri-industry	4	3		7
Peri-urban area	2			2
<b>Total</b>	<b>17</b>	<b>11</b>	<b>6</b>	<b>34</b>

**Table 4 - The main ESBOs focused in the different scales of PEGASUS case studies (%)**

Main ESBOs in PEGASUS case studies	Local: small scale	Local: medium/large scale	National/regional scale	Total cases
Biodiversity and landscape	41,2	18,2	16,7	29,4
Biodiversity and others	11,8	9,1		8,8
Landscape and others	11,8			5,9
Rural vitality and landscape	17,6	36,4		20,6
Water and others	11,8	27,3		14,7
Public recreation, education and health	5,9	0,0	16,7	5,9
Multiple ESBOs	0,0	9,1	66,7	14,7
<b>Total</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>	<b>100,0</b>

### 3 Market, social and institutional drivers

#### 3.1 Market drivers

Some of the 34 PEGASUS case studies examine initiatives that use market drivers to enhance the provision of Environmentally and Socially Beneficial Outcomes (ESBOs), as set out in Table 5 below. Although non exhaustive, this information enables us to identify those market drivers that are likely to exist and be most relevant in a range of different contexts. We have split the identified market drivers into three main typologies: (i) market drivers linked to the demand for sustainable food/forest products (such as organic, integrated, healthy food, sustainable wood products) and (ii) drivers linked to certification schemes that farmers/foresters and agri-food firms may adopt to differentiate their products. There are also other fundamental and well-known influential economic drivers both enabling and inhibiting the production and the delivery of ESBOs, e.g. technological drivers (which seem rather important for promoting innovation), price, supply and demand for food and wood products, consumer demand for cheap food notably in period of economic crisis, demand for biomass/biofuels, knowledge and information availability, exports performances and practices, market powers and structure of retail chains, etc. These additional economic drivers could be very important in some case studies and are likely to impact the demand for more sustainable quality food under social and environmental schemes. Nevertheless they are not to be discussed in detail in the report, since this analysis aims to explore notably institutional and policy factors and/or those factors more directly linked to the valorization of ESBOs.

**Table 5 - PEGASUS case studies for which market drivers are central to the initiative examined**

Types of driver	Examples	Case studies
Demand for sustainable food/forest products (organic, integrated and other labelling)	Organic label	extensive agriculture (AT-1; DE-2) and alternative networks (DE-3; EE-1)
	Local food	extensive agriculture (SI-1)
	Integrated products	intensive agri-industry (IT-1)
	Animal welfare	intensive agri-industry (NL-1)
	Territorial label (UNESCO)	extensive livestock (FR-3)
	Sustainable food procurement	
Quality, social and environmental certification	Biomass production	Forest areas (AT-3; CZ-3; EE-3)
	EU certification (PDO, PGI, TSG)	intensive agri-industry (FR-1) and extensive agriculture (IT-2; IT-4)
	National, local and voluntary certification	alternative networks (EE-2)
	Corporate Social Responsibility	Forest areas (EE-3)

Although the examples of market drivers listed above are not deemed to be representative of all possible market mechanisms that, to some extent, may contribute to increase the provision of ESBOs or to reduce their under-provision, they shed light on three important issues that are usually underestimated when the relation between agriculture/forestry sector and public goods is explored.

These drivers show how the provision of ESBOs cannot be explored and analysed only by looking at the production sphere and at the primary sector. When assessing the social and environmental performance of farming/forestry systems the relations that holdings have with downstream actors, particularly with the processing industry, retailers, the public sector as well as with final consumers are very important aspects to be considered. These actors may directly influence farming and forestry systems by stimulating the adoption of innovative and sustainable production methods, which can be evidenced by the adherence to social (e.g. Corporate Social Responsibility) and environmental certification. These can strongly influence the provision of ESBOs by farmers and foresters.

Secondly, these drivers show the complex and intertwined relationship between the economic performance of the farming and forestry sectors and their social and environmental performance. In other words, since in many cases there is a joint production of private and 'public' goods and services, market drivers are key instruments to obtain win-win solutions.

Thirdly, as will be explored further, market drivers can and are being influenced by the regulatory framework and policy support in place. Indeed, regulations and policies with a direct or indirect focus on ESBO delivery have the capacity to impact on the environmental, social and organisational innovation of farming/forestry systems. One of the questions to investigate in PEGASUS is how to enhance ESBO delivery on the long term.

In the following sections, the market drivers identified in table 5 (demand for sustainable food and certification) are briefly described, in order to have a more comprehensive picture of the role and the potential of such drivers at the EU level.

### **3.1.1 Demand for sustainable food (organic, integrated and other labelling)**

In the EU, the organic farming sector is supported largely through Rural Development programmes. The organic sector is vulnerable to changes in agricultural policy orientation. It experienced major development starting from the 1990s, thanks to both growing market forces, with increasing public awareness of environmental, resource use and health issues and a parallel increase in political support<sup>2</sup> notably through the adoption of the EU action plan for organic food and farming<sup>3</sup> laying down the basis for policy development in support of the organic sector with its initiatives aimed at improving standards and increasing efficacy, transparency and consumer confidence.

The growing share of organic farming in Utilised Agricultural Area (UAA) is explained by both support to organic farming and consumer demand for organic products. On one side, EU agri-environmental and organic schemes influence farmers' propensity to convert to organic practices for crop and livestock production. Organic farming provides a number of environmental and social benefits such as water and air quality (the non-use of chemical fertilisers and pesticides), the

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<sup>2</sup> EC Reg. No 2078/92, CAP Pillar 1, rural development and structural financial support for production and marketing of organic products, other national or regional organic support measures

<sup>3</sup>COM(2004) 415 final and SEC(2004) 739.

maintenance and improvement of soil fertility, animal welfare, and indirectly contributes to public health and food safety/quality. This in turn has a knock-on effect on increasing recognition from consumers and increasing demand for organic products.

In 2014, Europe had the second highest share of organic farmland in the world (11.6 million hectares, 27% of the world's organic agricultural land, 2.4% of the total agricultural land) after Oceania (17.3 million hectares, 40%, 4.1%). In particular, in the EU-27 10.3 million hectares are cultivated with organic methods (5.7% of the total agricultural land) by almost 340,000 producers. In the period 2002-2011, the EU27 area under organic production increased by 68% in absolute figures (6% per year, from 5.7 million hectares to 9.6) and from 3.1% to 5.4% as a share of the total UAA. In 2011, Spain (1.8 million hectares), Italy (1.1 million ha) and Germany (1 million ha) accounted for 41% of the total EU27 organic area. Italy showed a declining trend probably reflecting maturity of the organic sector, but in Spain and Germany there was still a positive trend in organic area development. According to Eurostat data, between 2003 and 2013, while the number of European holdings diminished by 28% and total UAA raised by just 1%, certified organic holdings increased by 48%, +4.3% per year (from 250 thousand to 350 thousand, that is from 0.8% to 1.7% of total number of holdings) and UAA under certified organic farming increased by 98%, +8.9% yearly (from 6.9 to 13.6 million hectares, accounting for 3.9% of total UAA).

In the EU, the organic market is very strong but quite differentiated within the single Member States. The organic markets in Germany, France, United Kingdom and Italy account for two-thirds of EU organic sales, Germany being the second-largest national market in the world (worth around 7.9 billion euros), France is the second-largest market in the EU (4.8 billion euros), followed by the UK (2.3) and Italy (2.15). Furthermore, the EU is the major world exporter of organic products<sup>4</sup>.

As far as retail sales are concerned, consumers interest remained high over the years and all countries showed a significant growth: in 2014, +7.6% in the European Union as a whole, +40% in Sweden, +10% in France (the second largest market in Europe, 4.8 billion euros), +4.8% in Germany (the largest European market, 7.9 billion euros), showing that consumers interest for organic products (mainly vegetables) remains high.

Besides organic, sustainable agriculture is also fostered through a number of certified voluntary schemes, such as the **integrated production systems** where special attention is paid to minimising adverse effects on health and environment, granting food quality and safety, soil fertility, water quality and plant protection. The integrated production approach takes into account environmental improvement but also economic and social requirements (competitiveness, production costs reduction, premium price, more profitability, fair incomes) and puts emphasis on all phases and stakeholders involved in the product lifecycle (raw materials, production, distribution, waste management). It differs, therefore, from integrated farming: "integrated production adopts a

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<sup>4</sup>Some of the leading exporting companies are:Hipp, De-Vau-Ge, Rapunzel (Germany), Royal Wessanen (Netherlands), Lea Nature Group (France).

sector-based approach with different rules according to the product in question, whereas integrated farming refers to the overall management of a farm” (European Economic and Social Committee, 2014).

However, there is no European legislation or guidelines in integrated production except for pest management<sup>5</sup> (compulsory from 2014): regulatory frameworks for integrated production and quality logos are set at national/regional level and may receive EU financial support under agri-environmental measures of rural development plans and operational programmes of CMOs. Some internationally recognised principles and standards are set by the International Organisation for Biological and Integrated Control of Noxious Animals and Plants (IOBC) and by the European Initiative for Sustainable Development in Agriculture (EISA). Both frameworks deal with food quality and environmentally-friendly but economically viable food production techniques, but while the EISA focuses on producers’ and consumers’ needs (production/consumption of quality food while ensuring viable farming business and protection of environment, natural resources, human health, animal welfare), the IOBC is centred on environmental concerns related to agricultural practice and the multi-functional role of agriculture.

In addition to organic and integrated production certification, there is a large number of **food labelling schemes** operating across Europe, some of which include environmental and social specifications. These are public and private voluntary environmental labelling schemes and environmental performance certifications, either attested by independent certification bodies or self-declared by uncertified operators or by producers/retailers. Among these, forest biomass and related products play a special role. Recently, a total of 901 food labelling schemes has been identified (Ipsos and London Economics, 2013), 20% of which were managed in Spain and 13% in Germany, followed by Italy (8%), Portugal (7%) and France and Czech Republic (6% each). They cover one or more policy areas<sup>6</sup> (mainly origin, organic farming and traceability); moreover 78% of them are certified schemes, 18% are self-certified and for 3% there is no information available.

The demand for agricultural products coming from farming systems that ensure a higher delivery of ESOs can be stimulated not only by private citizens and consumers, but also by the public sector. One important tool that governments and other public institutions have to influence the sustainability of economic systems is public procurement and, from an agricultural perspective, especially procurement linked to food and catering services.

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<sup>5</sup> Article 14 of Directive 2009/128/EC of the European Parliament and of the Council establishing a framework for Community action to achieve the sustainable use of pesticides.

<sup>6</sup> The policy areas considered in the Ipsos and London Economics study are: Food safety and hygiene, Traceability, Animal health, Animal welfare, Origin, Organic, Environmental management, Climate change, Socio-economic producers, Traditional products or methods, Religious requirement, Vegetarian/vegan, Allergen free, Health related, Taste/smell qualities, Directly from the farm/short supply chain, Other (e.g. Store management, etc.).

### **3.1.2 Demand for quality, social and environmental certification**

European Union adopts strict **quality schemes** that tie agricultural-food production to methods, characteristics and peculiarities of local assets and geographic origin: Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG)<sup>7</sup>.

**PDO, PGI and TSG** marks identify, protect and control typical traditional agricultural products and foodstuffs and exert a positive effect on economic and socio-cultural development of the whole production area. In fact, not only do they stimulate agricultural activities but also preserve cultural heritage, strengthen local image and attractiveness, influence social capital growth and foster the involvement of all key local private actors and public institutions. Moreover, origin-labelled products guarantee quality and traceability and bring benefit to consumers (food safety, reliable information on products and production processes), to producers (product liability and reputation, new market channels, higher sales price, reduced transaction costs) and other local economic sectors (promotional effect, tourist attraction).

Unlike wine, whose protecting rules date back to 1987<sup>8</sup>, for agricultural products and foodstuffs the first EU legislation on geographical indications, designation of origins and certificates of specific character was adopted in 1992<sup>9</sup> (. Protection rules were clarified and streamlined with the reform of the EU legislation for agricultural products and foodstuffs in 2006<sup>10</sup> (for wine in 1999 and then in 2008<sup>11</sup>), but it was from 2008 onwards that agricultural quality and protection policies reached their climax: adoption of the Green Paper on agricultural product quality in 2008, Prague High Level Quality Policy Conference and adoption of a Communication on agricultural product quality<sup>12</sup> in 2009, and, finally, the new Regulation on quality schemes for agricultural products and foodstuffs (No 1151/2012), the Delegated Regulation supplementing it (No 664/2014) and the Implementing Regulation for its application (No 668/2014).

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<sup>7</sup>PDO is referred to production, processing and preparation of agricultural products and foodstuffs in a specific geographical area using recognised know-how, as for PGI at least one of the stages of production, processing or preparation has to take place in a specific geographical area, whereas TSG identifies products or foodstuffs characterised by traditional raw materials and/or production and processing methods. TSG has had low take-up and the Commission is considering abolishing the current scheme and introducing the term 'traditional product' as a reserved term defined within marketing standards.

<sup>8</sup>Council Regulations No 822/87 on the common organization of the market in wine and No 823/87 laying down special provisions relating to quality wines produced in specified regions.

<sup>9</sup> EC Regulations No 2081/92 and No 2082/92

<sup>10</sup>Council Regulations No 510/2006 on PDO, PGI and No 509/2006 on TSG.

<sup>11</sup>Council Regulation No 1493/1999, then amended and repealed by Council Regulation No 479/2008 on the common organisation of the market in wine.

<sup>12</sup>COM(2009) 234 final, laying down strategic orientations for marketing standards, geographical indications, traditional specialties guaranteed, organic farming and certification schemes.

Between 1996 and 2015, a total of 1,294 PDO-PGI-TSG marks have been registered from European Union countries, half of which are PGI, 46% PDO and the remaining 4% TSG. A quarter of the designations were registered in 1996 and their number increased up to 2015 at an average yearly rate of 4%. 64% of the total number of registered designations belongs to just four countries: Italy (278, 21%), France (226, 17%), Spain (185, 14%) and Portugal (133, 10%).

Whilst acknowledging the impossibility for generalising due to the high number and variety of PDO/PGI products, a comparative analysis of 13 case studies (Areté, 2013) evidenced that in most cases they achieve premium prices, higher value of raw materials, higher retail prices and higher gross margin for final GI products over the corresponding standard products, even if with remarkable variability, thanks to intrinsic product differentiation, effective marketing strategies and tools (including short market chains and export-oriented strategies), and support for promotion and consumer awareness. However, concerning their reputation among consumers, individual PDO/PGI products are favoured rather than geographic indication products in general and, in general, there is poor knowledge of the logos introduced by the EU to ensure product quality and origins (European Commission, 2012).

Beside EU quality schemes, there is a wide range of public and private **voluntary certification schemes** for agricultural products and foodstuffs. They operate either at the business-to-business (B2B) level or at the business-to-consumer (B2C) level and range from compliance with compulsory baseline production standards laid down by government authorities to additional or higher requirements and they may cover products and processes or management systems. In 2010 the European Commission commissioned a study (Areté, 2010) in order to set up an inventory of existing certification schemes for agricultural products and foodstuffs and, on the basis of its empirical results, issued specific Guidelines<sup>13</sup> referring to voluntary certification schemes. The inventory listed 441 schemes and sub-schemes marketed in the EU, 424 of which originate in European countries (60% in four countries: Germany, Italy, Spain and United Kingdom), covering different policy areas (mainly traceability, safety and hygiene, origin and specific production environment, organic farming and organoleptic qualities).

Product specifications and value-adding qualities can be self-declared by producers also through labelling measures following **marketing and production standards** subject to official quality controls. Standards are meant to define common trading references and facilitate domestic and international trade, therefore labels are required to indicate product characteristics, minimum quality and farming attributes, such as technical descriptions, composition, class, size, production methods, indication of the country of origin, storage, transport, etc. Marketing standards have replaced national standards and most of them are laid down within Council Regulation for the Single Common Market Organisation (EC Reg. No 1234/2007, amended by Reg. No 361/2008) and its implementation rules (Commission Regulation No 1580/2007, as amended by Regulation No

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<sup>13</sup>Commission Communication(2010/C 341/04).

1221/2008<sup>14</sup> and No 771/2009), while others are within product specific directives (vertical directives).

Conformity to requirements stemming from European regulations is, however, a time consuming process which favours the proliferation of **private and national/regional certification** of agricultural products and foodstuffs standards, which require less cumbersome applicable standards and certification processes. In Italy, for example, there is a register of traditional agro-food products (Prodotti Agroalimentari Tradizionali - PAT), which is determined (and integrated yearly) by Regions and Autonomous Provinces and ratified by the Ministry of agriculture with a Ministerial Decree. The register contains national traditional niche products other than PDO, PGI and TSG but considered as expression of national cultural heritage.

In none of these schemes is environment protection and provision of public goods is a specific objective<sup>15</sup>. Nevertheless, often there are laws and subsidies related to the same products or production areas aimed at environmental or land protection, rural development, public health and food safety, etc. (products regulated by CMOs, participation in agri-environmental schemes, integrated production and organic production systems, etc.), therefore compliance with requirements of the aforementioned schemes, standards and certifications indirectly reinforces the environmental performance of laws and subsidies.

Finally, agri-food and forestry firms may also adopt some of the voluntary internationally recognised certification and standards, which can be synthesised under the broad concept of **Corporate Social Responsibility (CSR)** (e.g. for fair trade or sustainable forest management).

CSR has a long tradition in the business literature and it gained momentum over the last decade, being increasingly included in policy and strategic documents produced by the main international organisations (i.e., FAO, World Bank, European Commission, etc.). These organisations consider CSR a strategic tool that, by addressing an integrated way the economic, environmental and social strategies adopted by corporations and enterprises, may directly serve the goals of sustainable development. The European Commission (2011) defined CSR as “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis”. Although CSR is increasingly recognised as fundamental tool to achieve sustainability objectives through market mechanisms, when looking at its potential in delivering ESBOs associated to agriculture and forestry, it is necessary to take into consideration the following peculiarities:

- Role of farmers/foresters: due to the characteristics of the sector (i.e., entrepreneurs' relative anonymity and concentration of power in the processing and retailing sectors) it is very difficult for farmers/foresters to establish an appropriate position and reputation amongst final consumers through CSR standards. In other words, since farmers have weaker

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<sup>14</sup> Applying to apples, citrus fruit, kiwifruit, lettuces, peaches & nectarines, pears, strawberries, sweet peppers, table grapes and tomatoes.

<sup>15</sup> Agricultural product quality policy: impact assessment. Part b, geographical indications,

bargaining power compared to large suppliers, processors and retailers, the added value and public goods produced by them are usually less compensated through market based mechanisms such as CSR and more through public policies;

- Role of citizen/consumers: from a CSR perspective, it is important to bear in mind that citizens interact with the agri-food and forestry supply chains as (i) consumers, by buying products and influencing both positive and negative externalities of agricultural/forestry activities and (ii) as tax payers, by providing the financial means for public support to agriculture and forestry (Hediger, 2013).

When looking at the ESBOs associated with farming and forestry that could be provided through CSR, the analysis should not be restricted to producers and consumers but should encompass the entire agri-food and forestry supply chains, by looking at social, economic and environmental performances of the various actors along the entire value chain. Indeed, while ESBOs in the agricultural and forestry sectors are usually evaluated by looking at the role of public support to producers, CSR involves a the direct involvement of multinational companies and of medium and small sized enterprises, which adopt social and environmental friendly production methods (by going beyond what is required by law) in order to meet public expectations and to avoid the risk of blame by NGOs or the mass media. Particularly relevant here is the role of large retailers and trading companies, which can use their market position and bargaining power to enforce socially responsible behaviour along the food/forestry chains for their own interest (Hediger, 2013).

CSR may be considered a tool complementary to public support. Indeed, as argued by Mazur-Wierzbicka (2015), there are strong connections between the new challenge of the CAP 2014-2020 and CSR principles, namely higher standards for agricultural production based on environmental and social sustainability criteria.

In the table below the CSR instruments which are considered relevant for the provision of ESBOs in the agriculture and forestry sector are listed. It should be noticed that in addition to certification schemes and other CSR instruments listed in the table, companies (especially multinational companies, but also large trading companies and retailers) can also develop and implement their own tailor-made policies and tools to increase their social and environmental performance.

**Table 6 - Selection of CSR instruments relevant for ESBOs associated to agri-food and forestry sector**

Type of certification	Standards	Short description
International Standards UNI EN ISO	ISO 9001	Products quality
	ISO 14001	Environment management
	EMAS	Environment management and performance
	ISO 26000	Social responsibility
	ISO 14064	GHG emissions
	ISO 14040	Life Cycle Assessment
	ISO 14046	Water footprint
	ISO 14024	Environmental voluntary labels (ECOLABEL)
	ISO/TS 14067	Carbon footprint of a product (CFP)
Other international standards	SA 8000	Social accountability
	Fair Trade	Alternative approach to conventional trade
	FSC	Forest Stewardship Council
	PEFC	Program for the Endorsement of Forest Certification

Type of certification	Standards	Short description
Private standards	IFS	International Featured Standard
	GLOBAL GAP	Global Partnership for Good Agricultural Practice
	BRC	British Retailers Consortium
	LEAF	Linking Environment and Farming

CSR, as for other certification schemes, is a relevant market driver which has the potential to enhance the demand from actors along the food/forestry supply chain and ultimately influence farmers and foresters to deliver ESBOs in response to their demand. Certifications and labels allow consumers to make informed choices and to express their demand for higher standards for agricultural/forestry production based on environmental and social sustainability criteria (e.g. labour, animal welfare, systems' resilience, etc.).

### 3.2 Social, cultural and institutional drivers

Another important set of drivers which may strongly influence the capacity of the EU agriculture and forestry sectors in providing ESBOs concerns the social, cultural and institutional dynamics of rural areas. Similarly to the market drivers, the main social, cultural and institutional dynamics that can be considered relevant for ESBOs have been identified on the basis of the case studies. As can be seen in table 8, these drivers have been sorted into three types: (i) social and cultural dynamics, (ii) institutional dynamics and (iii) demand for leisure, recreation and education.

The examples listed in the table can be interpreted as direct drivers for the provision of ESBOs but also, for some of them (i.e. social and cultural dynamics and institutional change) as a sort of general background within which specific market and policy instruments operate. The relevance of these drivers has been largely recognised in the literature, especially by those authors that have looked at public goods provision by agriculture and forestry from a territorial perspective (Mantino, 2011; Van der Ploeg 2000; Van der Ploeg and Roep 2003). According to these sources, in order to analyse the provision of ESBOs through farming and forestry it is necessary to go beyond the strategies of farms and agri-food and forestry firms, by looking more in depth at the social, cultural and institutional settings where these farms and firms operate.

**Table 7 - PEGASUS case studies for which Social, cultural and institutional drivers are central to the initiative examined**

Types of driver	Examples	Case studies
Social and cultural dynamics	Cultural identity and lifestyle	extensive agriculture (IT-4) and peri-urban (PT-2)
	Emigration, abandonment, ageing population	extensive agriculture (SI-3; IT-4)
	Diversification and investments	extensive livestock (PT-1) and peri-urban (PT-2)
Institutional dynamics	Devolution to local authorities	alternative networks (UK-4)
	Involvement of public in land/landscape management	extensive livestock (CZ-1; CZ-2) and intensive agriculture (NL-3), forestry (CZ-3)

Demand for leisure, recreation and education	Educational activities	extensive livestock (CZ-2), forestry (CZ-3)
	Rural tourism	extensive livestock (AT-2; CZ-2; PT-1), forestry (AT3), extensive agriculture (IT-4; SI-1),
	Recreation and public enjoyment of green areas	extensive livestock (CZ-2), peri-urban (DE-1; PT-2;SI-2), forestry (EE-3), forestry (CZ-3)

Although an exhaustive analysis of these drivers goes well beyond the scope of this report, the main features of the three types of drivers are briefly discussed in the following sections, in order to better understand to what extent they may contribute to the provision of ESBOs.

### 3.2.1 Social and cultural dynamics

Social and cultural factors not only matter in terms of restoring and preserving heritage and identity but they also affect long term views of rural development. A favourable social and cultural context may result in an increased awareness and knowledge of local communities about environmental and social issues faced by farmers and foresters and may empower them to take responsibility for the development of local initiatives by adopting a constructive attitude.

EU strategies and programmes tackle problems of low population density and remoteness and farmland abandonment by means of support schemes meant to offset natural disadvantage and to create the basic conditions to keep people in rural areas and to encourage generational renewal and new young farmers in order to favour the multi-functionality of agriculture.

Member States encourage maintaining rural areas in good agricultural and environmental condition and try to avoid the fragmentation and the abandonment of agricultural land and holdings. Besides reasons linked to the impact of global action, land abandonment is believed to occur due mainly to three kinds of determinant: poor environmental/biophysical suitability, low economic performance, low agricultural income (Terres et al., 2013). As far as the forestry sector is concerned, two relevant social drivers should be considered: the land ownership and its dynamics over time (notably in many former socialist countries), especially the private/public structure of the land ownership; the type of land management and the rules/institutions governing such management. In other words this is linked to the diversity of lifestyle and motivation of the private land owners. But this also depends on the capability of public forest managers to respond to the increasing demand for recreational uses of forestry and at the same time preserve the ecological balance between productivity and conservation of forests.

At the private level, a relevant strategy to cope with these negative trends is the development of **diversification activities** in rural areas.

Whilst the incidence of agriculture in rural economies has declined, the importance of diversification in rural economies has grown. In the EU-28, as a whole, about 5.2% of farms had at least one other source of income, referred to as other gainful activities (Eurostat, 2013). If considered in terms of their economic incidence, the agricultural holdings that undertake secondary activities were more important, since they generated 18.9% of the agricultural standard output in the EU-28.

The inability to generate sufficient revenue from farming has led many farmers to diversify their activities, by engaging in pluri-activity and on-farm diversification. Also as a result of the diversification processes adopted by farmers and foresters, as well as urban out-migration to the countryside and rural tourism, some rural areas have increasingly become sites of consumption as well as of non-agricultural business, whereas farms have moved towards multifunctionality, producing a broad range of ESBOs for both the rural community and the urban population.

### **3.2.2 Institutional dynamics**

Together with social and cultural dynamics, ESBOs provision can be strongly linked to the changes occurring in the institutional environment, since it is increasingly acknowledged that effective governance solutions can make public intervention and the market drivers more effective.

Two main issues related to the mechanisms of ESBO provision deserve particular attention: the process of a regionalisation of the implementation of policies and the need to explore innovative governance solutions at the local level.

With regard to the first issue, it may be argued that in the EU the public intervention in agriculture is rather centralized, and central/regional governments still play a very crucial role. Nevertheless, during the last decades important efforts have been made to increase decentralisation and to promote more locally defined rural development and agricultural policies. The devolution of powers to local bodies can be considered a crucial aspect to increase the effectiveness of rural development policies on the ground, but also to promote more effective and tailored solutions for public goods provision (Mantino, 2010).

From this perspective, an interesting example of institutional dynamics that can promote the ESBOs provision (mainly social outcomes) is the case of social farming. As showed by Di Iacovo and O'Connor (2009), whilst the lack of opportunities in rural areas is often connected to the absence of adequate and innovative services for everyday life, social farming can offer appropriate solutions that fit the local needs of inhabitants. This process can be stimulated by the erosion of public healthcare provision traditionally ensured by the central governments, by pushing towards decentralised solution based on flexibility, proximity, and informality. In this new configuration, innovative social systems and local networks are defined, and farms are stimulated to play a central role in the provision of services to local inhabitants and rural communities.

The role of devolution is strongly linked to the second driver regarding institutional dynamics, namely the capacity of local actors to design and implement innovative and visionary solutions for the provision of ESBOs. As discussed by many authors (Hagedorn et al. 2002; Van Huylenbroeck et al. 2009), the provision of public/private goods cannot be addressed through straightforward solutions such as leaving the allocation problem of private goods to the market and that of public goods to the government. In many cases it is necessary to explore innovative solutions, based on mixed public-private arrangements and on solutions which directly involve the population in the definition and delivery of goods and services.

As emphasised in recent studies, innovative institutional arrangements can be promoted also for the provision of public goods and ecosystem services associated to agriculture (OECD, 2013; Vanni, 2014). These innovative solutions are usually based on a stronger involvement of local actors in defining and implementing delivery mechanisms which often involve the valorisation of a specific collective action carried out for ESBOs purposes. Multi-stakeholder arrangements have been also observed in several PEGASUS case studies where, for example, the involvement of the public in land management projects has brought the sharing of responsibility between the government and the citizens, through the development of hybrid regimes combining centralised and decentralised state and community institutions.

National governments and international organisations increasingly consider **sustainable public procurement** as part of green growth strategies and it can be included as a significant driver for ESBOs associated with agriculture and forestry for several reasons. The assumption is that, by purchasing environmentally and socially preferable goods, governments can have significant impacts on green economy transformation as part of sustainable development goals.

According to the OECD (2014), taxpayers' money spent by governments on goods, services and infrastructures accounts for 13% of gross domestic product (GDP) on average in OECD countries. At the EU level, over 250,000 public authorities spend around 2 trillion euros (19% of EU GDP) on the purchase of services, works and supplies every year. Therefore, due to their huge purchasing power, public authorities bear particular responsibility as far as the environmental impacts of procurement are concerned. At this regard, the European Commission highlights how the introduction of green public procurement (GPP) criteria in tenders may be beneficial not only in environmental terms (achievement of environmental targets, example to private consumers, channel for raising environmental awareness), but also in social, health, economic and political terms: improvement of quality of life, higher quality standards for products and services, reduction of life-cycle cost (LCC), development of greener technologies and products, reduction of prices for environmental technologies due to increased competition, evidence of public authorities' pledge to make environmentally sound and sustainable purchases a priority.

As regards the sustainable public procurement of food and catering services, public sector institutions (hospitals, care homes, schools, universities, prisons, armed forces, and canteens in government buildings) represent a significant part of the procurement of any national food economy. Criteria for GPP for food and catering services, currently under revision, are meant to favour procurement of organic food or produced under "integrated production systems", possibly in bulk or in recycled packaging, use of reusable cutlery, crockery, glassware and tablecloths and environmentally friendly paper products, selective waste collection, etc.

In the literature there are several examples of public authorities that at the local, regional and national levels have adopted sustainable procurement practices (Morgan and Sonnino, 2008; Smith et al., 2015). At the same time, as result of the complexity of the public procurement geography at the EU level and of the significant variations in expenditure across different levels and from region to region, there are not harmonised data at the EU level.

Existing research, based on local case studies, demonstrates that sustainable public food markets can have important social, economic and environmental effects. Amongst the main economic effects are:

- the benefits to local and regional communities through the development of new markets stimulated by large (public) buyers;
- the enlargement of a civic led economy that supports innovative food production strategies and sustainable consumption practices;
- the reduction of diet related ill health costs.

Alongside these economic effects, also relevant ESBOs are associated with food procurement, which are listed in the table below.

**Table 8 - ESBOs associated to sustainable food procurement**

Social BOs	<ul style="list-style-type: none"> <li>• Increased availability of healthier and seasonal food</li> <li>• Enhancement of local cultural traditions and practices</li> <li>• Increased awareness on sustainability and equity principles amongst population</li> </ul>
Environmental BOs	<ul style="list-style-type: none"> <li>• Reduction of ecological footprint</li> <li>• Development of low impact production methods with reduced GHG emissions</li> <li>• Improvement of natural resources and ecosystem components</li> </ul>

### **3.2.3 Demand for leisure, recreation and education**

One example of this typology of drivers is **rural tourism**, which can be considered not only as one of the key opportunities in terms of potential growth for rural areas, but also one of the most relevant social drivers for the provision of ESBOs associated with farming and forestry.

From a supply perspective, the development of agri-tourism and other tourism facilities in rural areas is strictly interconnected with the economic dimension and with the need to cope with agricultural income fluctuations and risk management. At the same time rural tourism can be an important drivers to stimulate the provision of ESBOs such as environmental protection and conservation (biodiversity conservation, water quality) but also all the other social dimensions related to rural vitality.

## 4 The role of public policies

The policy role in providing ESBOs is quite a complex matter: in the same territory, as we describe later on, several institutional actors as well as different types of policies overlap or coincide. Thus reconstructing the policy framework requires studying:

- The regulatory framework influencing the specific ESBO (directives, regulations, national and regional laws, guidelines, etc.);
- The policy mix that either directly or indirectly affects the ESBO under examination.

Both regulatory framework and policy mix are set up at three different governance levels: European, national/regional (depending on the national institutional setting) and local. The regulatory framework is always set at the EU level through Directives and/or regulations to be applied by Member States<sup>16</sup>. But, frequently it is also composed of national and regional legislation which must be consistent with Directives/Regulations while defining more specific rules or adapting the general European rules to the national setting.

Following the classification in Cooper et al (2009), policy instruments and measures can be divided into three broad groups:

- a) measures with direct focus on the provision of public goods, when this provision is the primary rationale;
- b) measures with a partial focus on the provision of ESBOs, where provision is not the primary rationale, but that somehow try to improve the sustainability of agriculture or enhance natural capital (e.g. the natural handicap payments for as Areas facing Natural Constraints – ANC);
- c) measures with no direct focus on the provision of ESBOs, but with some potential positive impact (e.g. decoupled direct payments under the 1<sup>st</sup> Pillar or the farm diversification measure under Axis 3 of Rural Development Policy).

This classification, although quite simple in principle, raises some methodological difficulties because it can generate inappropriate identification of policy instruments and measures. This is due to the following reasons:

- most of policy measures delivered in a given territory, as those presented in the case studies hereafter, affect the provision of ESBOs, both directly and indirectly, because they contribute to the income from farming and non-farming activities;
- policy measures with indirect effects on environmental ESBOs in reality contribute greatly to the provision of social ESBOs, that in the context of this research are identified by “rural vitality”.

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<sup>16</sup>For example, the fundamental rules governing water management and concerning quality and availability of the resource are set within the Water Framework, Nitrate and Groundwater Directives.

For the purposes of PEGASUS we can thus divide policy instruments and measures into broad categories:

- a) policy support with direct focus on the ESBOs under examination;
- b) policy support with indirect focus;
- c) policy support with a direct focus on rural vitality, where this ESBO is considered relevant.

In a given social and ecological system (SES) there is always a mix of different policies contributing to the ESBOs, both directly and indirectly, and with reciprocal interactions and different intensities. All these different policies are used by local stakeholders both as incentives to adopt more sustainable practices and, at the same time, as a way to enhance farm economic viability. In reality it is quite hard to evaluate the impact of a single policy instrument because of the plethora of effects and the interactions among them. For these reasons it seems necessary at least reconstructing the picture of all policies activated and try to study the different roles they perform in a given SES.

We believe that the type of socio-ecological system is a key variable to understand the profile of policies and the regulatory framework relevant at territorial level. In our analysis of the case studies the socio-ecological systems examined in the country reports can be classified in three main types: intensive agri-industrial, extensive agriculture and livestock, forestry area, peri-urban areas. This four macro-categories can be considered as broader interpretation of the differences in the European socio-ecological systems. They manifest different policy needs and a different demand of policy tools. To describe the different mix of policies in each type of mentioned socio-ecological systems we present here three different cases studies:

1. the first is *an intensive agri-industrial area in Italy*, very specialised in the processed tomato supply chain and with high economic pressure on renewable resources, especially water and soil;
2. the second is *an extensive and Landscape Protected Area in the Czech Republic*, whose main ESBO is identified by *dry meadows of extremely high biodiversity*, especially plant diversity, with a mosaic landscape;
3. the third is representative of *peri-urban forests in Slovenia*, in two different settings: the country's capital Ljubljana and the city of Celje. This case can be considered as representative both of peri-urban system and of a forestry area.

#### **4.1 An intensive agri-industrial area in Italy**

This supply chain is relevant in the national and the European market (50% of Italian processed tomatoes and 25% of European production) and it is strongly concentrated in some provinces of Emilia-Romagna and Lombardy. Despite high productivity and intensive production practices, this supply chain is adopting several public schemes in order to comply with European and national rules on water, nitrates and pesticides use.

Table 9 illustrates policies acting in this area at EU, national/regional and local level (on columns) and divided into three categories (in rows: regulatory, with direct focus on water and indirect focus on water). Water is the main ESBO under stress in this food chain. This table gives also the idea of the broad spectrum of policy instruments used by farmers and the tomato industry in this area to support the process of reorganisation towards more sustainable practices and technologies, especially through structural measures in the regional RDP.

**Table 9 - Policies and multi-level institutional governance of an intensive agri-industry area: the canned tomato case in Emilia-Romagna (Italy) IT-1**

Policy frame impacting on water quality/availability	Level of governance		
	EU	State/Region	Local area
Regulatory framework	<ul style="list-style-type: none"> <li>- Water Framework Directive</li> <li>- Nitrates Directive</li> <li>- Groundwater Directive</li> <li>- Sustainable use of pesticides Directive</li> <li>- Fruit and vegetable CMO</li> <li>- Inter-branch organisations Regulation</li> <li>- Rural Development Regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Cross-compliance guidelines</li> <li>- Integrated agricultural practices guidelines</li> </ul>	<ul style="list-style-type: none"> <li>- Plan of the River Po Authority</li> </ul>
Policies with direct focus		<ul style="list-style-type: none"> <li>- Agro-environment climatic measures (regional RDP)</li> <li>- Investment in irrigation scheme (small-scale water)</li> <li>- Investment in tomato food processing (water saving) (regional RDP)</li> <li>- Regional rural policy: research projects in Water saving technology</li> </ul>	<ul style="list-style-type: none"> <li>- Technical advice and governance</li> </ul>
Policies with indirect focus		<ul style="list-style-type: none"> <li>- Direct payments to farmers (I pillar)</li> <li>- CMO Fruit and vegetables Operational Programmes</li> <li>- Promotion activities concerning products within quality systems (regional RDP)</li> </ul>	<ul style="list-style-type: none"> <li>- Research projects by the local research agricultural centres</li> </ul>

In this case the crucial policy impulse has been given not by the environmental regulatory framework, but by the reform of the Common Market Organisation of the fruit and vegetable sector (at the European level), which forced farmers and food industries' organisations to cooperate in a more effective form: the Inter-branch Organisations (IO) for processed tomatoes (Giacomini and Mancini, 2015). Among other things, IO for processed tomatoes in north Italy fostered the adoption of private schemes for integrated production and, more recently, the spur for environmental certification of the processing industries. This is an example of what we call indirect policy actions in the provision of ESBOs, which can be as relevant as direct ones. In the category of direct policies an important role is played by local research centres, carrying out specific research for the tomato district and focusing on water saving techniques.

## 4.2 An extensive and Landscape Protected Area in Czech Republic

Dry meadows in this area are linked to the local beef production (and to a smaller extent to sheep production), under the national law that regulates the intensity of agricultural inputs (exclusion of fertilisers and pesticide use) and grazing. The maintenance of dry meadows is strongly related to the continuation of beef production over time: through the national Programme for Landscape management and AEM schemes in the national RDP, farmers can get payments for tailored management of the most valuable sites in protected areas. Table 10 illustrates the whole spectrum of policies playing a role in the dry meadows case study.

**Table 10 - Policies and multi-level institutional governance of an extensive livestock area: the case of dry meadows in Czech Republic (CZ-1)**

Policy frame impacting on ESBO	Level of governance		
	EU	State/Region	Local area
<b>Regulatory framework with direct implications on biodiversity</b>	<ul style="list-style-type: none"> <li>- Birds and Habitats Directives</li> <li>- Birds Directive</li> <li>- Structural funds regulation</li> <li>- Rural Development Regulation</li> </ul>	<ul style="list-style-type: none"> <li>- National law on Nature Protection</li> <li>- Cross-compliance guidelines</li> </ul>	<ul style="list-style-type: none"> <li>- Nature 2000 management</li> </ul>
<b>Policy support with direct focus on biodiversity</b>	<ul style="list-style-type: none"> <li>- Life+ programme</li> </ul>	<ul style="list-style-type: none"> <li>- Operational Programme for Structural Funds: Preservation and restoration of Biodiversity</li> <li>- Agro-environment climatic measures (national RDP)</li> <li>- Natura 2000 measures (national RDP)</li> <li>- National programme for landscape management</li> </ul>	<ul style="list-style-type: none"> <li>- Technical advice by the Nature Conservation Agency</li> </ul>
<b>Policy support with indirect focus on biodiversity</b>		<ul style="list-style-type: none"> <li>- Direct payments to farmers (I pillar)</li> <li>- Payments to areas facing natural or other</li> </ul>	<ul style="list-style-type: none"> <li>- Support from local NGOs</li> </ul>

The survival of the beef production is not only linked to policy instruments focusing on biodiversity management, but also to financial provisions delivered through the 1st Pillar (direct payments) and LFA payments. As stated in the country report, “because beef production is loss-making, farmers take supports as a means to sustain the production. Supports, as direct payments and LFA payments, prevent farmers from leaving the grass undermanaged. All in all, the combination of these schemes prevents quite effectively land abandonment (the most important threat) and the meadows are managed in a way that the high natural value of the site is maintained” (Camska and Prazan, 2016).

This positive effect is possible thanks to the combination of different schemes by the Nature Conservation Agency (that uses in a flexible manner diverse schemes and funds from the Ministry of Agriculture and the Ministry of Environment and makes sure that measures complement each other). This Agency also coordinates public efforts and private actions with the help of a local NGO.

### 4.3 Peri-urban forests in Slovenia

In the municipalities of Ljubljana and Celje there is interest and political will for the use of peri-urban forests for public health and leisure functions. This is incentivised by the national regulatory framework (the Forest Act states free access even to private forest land) as well as by the national forest management plan, and is emphasised by the plans of the two municipalities. The most relevant difference with the previous cases is that in peri-urban areas local municipalities play the lion's share in the definition and the management of policy instruments targeted to ensure access to all needed facilities. Table 11 gives an idea of the main policies having some role in affecting outdoor recreation and public health in rural contexts.

**Table 11 - Policies and multi-level institutional governance in a peri-urban area: the case of urban forests in Slovenia (SL-2)**

Policy frame impacting on ESBO	Level of governance		
	EU	State/Region	Local area
<b>Regulatory framework with direct implications on public recreation and health</b>	<ul style="list-style-type: none"> <li>- Habitats Directive</li> <li>- Structural funds regulation</li> <li>- Rural Development Regulation</li> </ul>	<ul style="list-style-type: none"> <li>- National legislation on forest: the Act on Forests</li> <li>- National planning on forest: the national Forest programme</li> </ul>	<ul style="list-style-type: none"> <li>- Municipal spatial plan</li> </ul>
<b>Policy support with direct focus on public recreation and health</b>			<ul style="list-style-type: none"> <li>- EU Regional programmes: investment in green tourism facilities</li> <li>- Local municipalities: facilities for tourism promotion</li> <li>- Local municipalities: plans for urban forests and co-financing of projects on sustainable forests management</li> </ul>
<b>Policy support with indirect focus on on public recreation and health</b>			<ul style="list-style-type: none"> <li>- Local municipalities: compensation payments for private owners</li> </ul>

In the case of the city of Celje, the local municipality ensures the resolution of conflicts with private owners when a public trail crosses their private property through compensation payments. Moreover, available funds from EU regional policies represent an opportunity to enhance small infrastructures and to strengthen the multi-functionality of urban forests.

The analysis of country reports give us a good illustration of the diversities of European settings, and can also suggest some relevant conclusions:

- Each SES is affected by a range of different policies, all contributing to some extent to the provision of ESBOs. This means that the distinction between direct and indirect policy instruments and measures can be misleading if it brings us only to focus attention upon direct policies: indirect policies can be as relevant as the direct ones in influencing beneficial outcomes.

- The relevant policy mix might vary according to the type of SES and within the policy mix regulatory frameworks play always a crucial role, not only at the European level, but also at national/regional level and sometimes at local level too (see the case of the peri-urban forest area in Slovenia). Some national reports emphasise the role of the regulatory framework, since it might be more effective than financial support under the CAP (Kocjancic et al, 2016).
- Policies under the CAP are very frequently the relevant policies influencing the ESBOs provision. The role of the 1<sup>st</sup> Pillar, in particular, is rather controversial: in the most intensive areas intensification processes, perhaps induced by the coupled subsidies system, contributed to generate negative externalities in the use of natural resources, in particular water and soil (Guiomar et al, 2016). In extensive areas, subsidies in the form of decoupled direct payments contribute to maintain farmers' income over the time and their economic viability, thereby enabling them to provide public goods.
- The role played by the 2<sup>nd</sup> Pillar is relatively less controversial. The policy measures frequently used are AEM payments. These measures always play some role in the diffusion of more sustainable practices, this happens not only in intensive systems, but more generally in all types of agricultural/livestock system. It must be noticed that under the AEM payments heading there are very different types of instruments, whose relative effectiveness changes greatly from one to another. Some national reports contest the real effectiveness of these measures (in Slovenia and Estonia). Some others outline good outcomes of AEM schemes, especially when tailored to local needs with broad margins of flexibility (in Czech Republic).
- Rural development measures are also relevant in supporting farmers and the food industry to adapt to demanding environmental standards set by EU rules. This holds in particular in many intensive agricultural/livestock production systems (e.g. dairy production in the Netherlands).
- Rural Development policies and Cohesion policies usually work together in supporting rural vitality. This is true especially in extensive farming systems and in some regions (former Objective 1 regions/less developed areas of Slovenia, Estonia and Italy). The joint use of these policies derives more from a pro-active coordination at the local level than at the state/regional level (management authorities).
- Nevertheless, in Portugal the CAP (both pillars) and Cohesion policy supported the diffusion of irrigation and more intensive olive groves in South Alentejo, determining negative externalities such as water contamination, depletion of groundwater resources, reduction of biodiversity, etc. These processes are relatively recent (last decade), increasing conflict with environmental EU directives (e.g. the requirements related to High nature Value Farming Systems).
- There are interesting cases of complementarities between CAP and national policies, as in the case of AEM payments and national measures for biodiversity and landscape (like the Czech case). Even in this case, these complementarities are the outcome of actions

undertaken by local stakeholders and institutions to make best use of available funds for the conservation of natural resources and local heritage.

- As we discuss in the next paragraphs, collective action takes different forms and organisations, but only in one case do farmers make use of RDP support for cooperation costs (the territorial agreements for biodiversity conservation in Marche region, Italy).

## 5 The role of market-based policy mechanisms

Public policies are not the only available mechanism to enhance the provision of ESBOs. There is a huge literature on the different types of market-based mechanisms and in particular on the use of payments for ecosystem services (PES) (DEFRA, 2013; FAO, 2011; Wunder, 2005). Nevertheless, PES are part of the broader category of market-based mechanisms. Re-adapting the classification proposed by Wunder (2005), we can distinguish at least four market-based mechanisms:

- a) Premium price payments;
- b) Compensations for additional costs;
- c) Certification schemes;
- d) Integrated conservation and development projects (ICDPs).

Before discussing these different mechanisms, we would outline that initiatives aiming at the provision of ESBOs might often be supported at the same time by public policies and market-based mechanisms in a complementary way. DEFRA (2013, p. 13) divides PES in three broad categories: 1) *public payment schemes*, “through which government pays land or resource managers to enhance ecosystem services on behalf of the wider public”; 2) *private payment schemes*, “self-organised private deals in which beneficiaries of ecosystem services contract directly with some provider”; 3) *public-private payment schemes*, “that draw on both government and private funds to pay land or other resource managers for the delivery of ecosystem services”.

**Table 12 - Market-based policy mechanisms found in the PEGASUS case studies**

Type of mechanism	Case studies available
Premium price payments	pasture management and organic milk (AT-1); outdoor grazing systems (NL-1); traditional orchard meadows (DE-2)
Compensation for higher costs	Volvic water company (FR-2); compensation payments to forest owners (SI-1); farmers, beer and water (NL-2)
Certification schemes	– organic production: farm networks (EE-1, EE-2); bergamot organic production (IT-2) – environmental label/certification: biosphere reserve Lunghau (AT-2); ISO certificate in State Forest Management Centre (profit-making State agency) (EE-3); processed tomato district (IT-1); Skylark foundation (NL-4)
Integrated conservation and development projects (ICDPs)	farmers, beer and water (NL-2); WILD river basin management initiative (UK-1); Hope Farm (UK-2); wet meadows (CZ-2); Regional Value Shareholder Corporation (DE-3)

The co-existence of public and private payment schemes in the same territory is very frequent in PEGASUS case studies as well. In our classification, premium price payments and compensation for higher costs can be defined as types of private PES.

Premium price payments are generally product-based schemes where food processors and/or consumers pay a “green premium” on top of the market price for a production scheme that is certified to be environmentally friendly. This additional payment is usually organised through the supply chain. The payment rewards production methods with high positive impact on ecosystem

services (table 12): for example, pasture management that increases the quality of milk and positively affect biodiversity (AT-1) or an outdoor grazing system as a distinctive part of landscape and as a means to ensure animal welfare and reduce production costs. In the case of German traditional orchards, producers have to comply with the requirement of replanting and maintaining old apple trees.

Premium price is often coupled with another market-based mechanism: the certification scheme. In the Austrian case (organic farming in mountain region Murau) in reality there are three complementary schemes operating in the same territory (Nigmann et al., 2016): the organic certification, the premium price for high quality milk and public schemes of AEM and LFA, whose access represents a basic requirement to apply for the premium price. This market-based mechanism requires a well-organised supply chain and obviously a market appreciation of the environmental/social quality embodied in the product price. The first condition is rarely met in most rural areas, especially in the most remote and marginal ones, where market mechanisms are substituted by public policy schemes.

Organic production is one of the most frequent cases of certification (as in the Estonian initiatives and in one Italian case). Environmental certification is also frequently adopted through ISO certificates and other private forms by networks of farms (the case of the Skylark Foundation in the Netherlands) or producers' organisations in the supply chain (the processed tomato chain in the North of Italy). The success of certification schemes depends not only on the control of standards, but also on the consumers' willingness to pay for ecosystem services embodied in the certificated products. For this reason initiatives also try to set up better contractual agreements within the supply chain: a) between producers and food processors; b) between producers/food processors and large scale retail channels, etc. This seems the winning strategy to ensure a viable and stable valorisation of ESBOs embodied in the certification schemes.

Integrated conservation and development projects (ICDPs: Wunder, 2005) presuppose two fundamental conditions: a) a vision more strategically-oriented than agri-environmental schemes, which is able to combine a more sustainable and simultaneously profitable private production through structural interventions; b) pro-active participation of private investors, either firms or civil society. This does not exclude the participation of public money, through public-private partnerships. In ICDPs the success of long term sustainable strategies is pursued through policy tools typical of structural policy: investment in environmental infrastructure and facilities, training, advice to farmers, etc. In some projects (the case of Czech Republic) land acquisition is also adopted by a local NGO as a means to promote the conservation of high value landscape and biodiversity.

In conclusion, the analysis of the literature and PEGASUS case studies confirms that private schemes could play an interesting role in the provision of ESBOs, but with the following specifications:

- Private schemes in different territories are often combined with public ones;
- Some of them could be identified with the broad category of PES as a form of market-based appreciation;

- Private schemes are not only pushed by market forces, but also by civil society demands for public participation, natural resource conservation and social cohesion. These motivations are more evident in ICDPs;
- Both in PES and in certification schemes a crucial variable emerges as a key to success: the capability of setting up better contractual agreements between the producers of the supply chain and between producers and final markets. This implies that PES or certification schemes alone are unlikely to provide sustainable outcomes.

## 6 Institutional and governance innovations: the role of collective action

The purpose of this section is to summarise the main characteristics of collective action in the relevant literature and examine which criteria can be used to interpret the diverse types of initiatives, collective or individual. Reviews of works on collective action and agri-environmental public goods (OECD, 2013; Davies et al, 2004; Vanni, 2014) identify three common features of collective action:

- a) A group of farmers, including sometimes non-farm stakeholders (other people or organisations);
- b) An action taken directly or on behalf of the group, through some form of organisation;
- c) The achievement of common/shared interests and objectives.

In a nutshell, key words to recognise collective actions are: group, action, organisation and common interests. According to institutional economists, collective action becomes advantageous when potential benefits of cooperating outweigh the transaction costs of developing and setting up some new form of organisation. Potential benefits arise because collective action allows:

- Managing problems at a geographical and ecologically appropriate scale;
- Providing public goods at lower costs because of economies of scale and scope;
- Creating new knowledge or simply sharing existing knowledge from the collaboration of various participants;
- Increasing credibility of actions and objectives;
- Providing room for greater flexibility and local relevant responses;
- Building capacity to cope with future changes.

Collective action can take different forms and typologies of organisation. The OECD (2013) classical definition divides collective actions into three types, based on the participants: a) farm-led action; b) non-farm-led action; c) government-led action. Then it identifies the first two as bottom-up and the third as top-down approach. These classifications do not seem capable to capture the key factors explaining the governance of collective action, because:

- Collective action is usually carried out by multiple actors and some studies point out that a good start depends on a sufficiently large number of participants and on the management capability of those who take a lead in the process. In a multi-actor initiative farmers are only a component of the partnership, while the real lead can be within the supply chain or within

a given territory among civil society. The lead can also be taken jointly by a public-private partnership;

- Initiatives might be driven by public or by private actors, but in different cases it is hard to distinguish real driving factors because over time they result in a combination of top-down and bottom-up approaches.

For these reasons we believe that initiatives can better be divided into four types: a) individual action; b) collective action-public policy driven; c) collective action-private actors driven; d) collective action-public/private partnership driven.

Initiatives b), c) and d) are always characterised by the presence of multiple cooperating actors with the aim of improving the provision of public goods and ecosystem services. The crucial difference is in the type of actor promoting/coordinating the action strategy, and the setting up of the organisation needed to carry out the project.

In initiatives of type b) the role of promoter/coordinator is taken by some public institution which is also providing the financial/technical support. An example of this case is represented by agro-environment-climate measures promoted throughout the EU and e.g. in the Marche region (Italy) by the regional department of agriculture and funded by the RDP. In the Marche region specifically, this policy innovation was introduced in the regional plan and implied a strong public commitment in the implementation phase through an intense cooperation of different regional departments (agriculture and environment) and local authorities as well. The key innovation in this case is institutional because the main achievement was a new partnership approach within the public domain. This was the necessary premise for the good start (and not only) of agro-environmental agreements.

In initiatives of type c) the role of promoter/coordinator is taken by some private organisation. This is the case of many initiatives undertaken by food chain actors (producers and food industries): as an example, in the Netherlands' initiative of "Farmers, beer and water" the Bavaria brewery is using a private scheme to compensate farmers in case of droughts, but soon the local farmers union realised that a project for recycling water which is discharged would be needed. Then the idea was agreed by other stakeholders (non-farmers) and the initial idea became a project shared by Bavaria, farmers and water authorities, under the support of the Ministry of Economic Affairs. Here the leading actor started the initiative and then involved other local and national relevant stakeholders to make it possible over time.

In initiative of type d) the role of Agency is taken by a set of institutions/organisations, cooperation is more structured in a partnership of private-public nature. This process requires more time, skills and reputation than usual, either because the social-ecological system has a medium-large scale or because too many institutional stakeholders are at stake. This is the case of the processed tomato in North of Italy, where a permanent partnership between the supply chain organisations and the province of Parma has taken the lead of all initiatives. Another example can be the WILD catchment-based project in UK, involving a complex partnership between the Environment Agency,

Farming and Wildlife Advisory Group, Gloucestershire Rural community Council, Costwolds Water Park Trust and CCRI, with the objective of improving water quality.

In PEGASUS, most of the case studies involve collective action and private-driven initiatives (table 13). It is interesting to verify which are the leading actors in the diverse types of collective action: in the private-driven cases the lion's share is taken by NGOs and supply chain actors (in partnership). This means also that farmers and food industries might create new alliances to cope with environmental challenges and competitiveness. These cases are of considerable interest in the next steps of the research. Few cases are driven directly by individual farmers or groups of farmers. It must be noticed that in the individual action we include the traditional policy delivery, that is, when national/regional governments deliver funds to individual farmers undertaking the project.

**Table 13 - Individual and collective actions and type of lead actor involved**

Lead Actor	Individual action	Private driven-collective action	Public policy driven-collective action	Public/Private partnership driven-collective action	Total
Local authorities	3			1	4
Environmental agencies (public)	2	1		1	4
Development Agencies				1	1
food chain's actors in partnership		4			4
group of farmers		1	1		2
private companies		2			2
NGO	2	6			8
Private-public partnership				2	2
Non-defined	5	1	1		7
<b>Total</b>	<b>12</b>	<b>15</b>	<b>5</b>	<b>2</b>	<b>34</b>

How are relations organised between the different actors in collective action? Are they entirely formal? These issues concern the governance of collective action in place and have relevant policy implications. Using the available information from case studies, we can summarise the governance of relations in five general categories, as illustrated in the table 14. This exercise was possible only for 20 cases, based upon the information provided. It seems that formal governance prevails over informal ones. This means that after promoting the initiative, one of the most critical steps is formalising the cooperation/collaboration between parties at least with some agreement, on the basis of which each actor agrees on objectives, tasks and reciprocal commitments. Only five cases are based on informal agreements. Among the formal modes, formal agreements between stakeholders and formal contracts within the supply chain are the most popular approaches.

**Table 14 - Modes of organising the relations between actors**

<b>Governance of relations</b>	
Formal organisation	2
Formal contracts within the supply chain	5
Formal agreements between stakeholders	6
Formal place of dialogue (e.g. networks)	2
Informal cooperation between stakeholders	5
<b>Total</b>	<b>20</b>

## 7 Inside the Social-Ecological System: implications for the analysis of market, socio-institutional and policy drivers

The PEGASUS project applies a Social-Ecological System (SES) framework, derived from the McGinnis-Ostrom (2014) framework, for the analysis in the 34 case studies. The SES provides a common frame to study and analyse the different variables impacting the delivery of ESBOs and their relationships. This section intends to link some of the conclusions from this report to the variables of the SES framework.. We will focus on two first-layer categories of the SES scheme:

- a) Governance systems;
- b) Actors.

In particular we think that of this theoretical framework deserve more attention four specific topics: geographical scale of governance systems; policy area, rule-making organisation and typologies of actors.

In terms of the geographical scale of the governance systems, the report draws the attention to the fact that the most appropriate scale for defining the scale of action has to be consistent with the improvement/valorisation of ESBO delivery. It is evident that in some case studies, there is a good focus on the most relevant scales for ESBOs, while in other case studies, the scale is more imprecise, especially for initiatives which rely on a network of people spread across a large territory, e.g. Care Farms in the UK but also in some sectors (forestry) or where knowledge about initiatives and forms of collective action is still incomplete. In general, a large scale does not facilitate understanding of the relevant ESBOs. A good trade-off could be in the definition of a few significant ESBOs or, in alternative, of one well-defined action carried-out by a group of stakeholders that produce/are producing clear outcomes.

The second relevant topic is given by what in the SES language is called the “policy area”. This includes both public policies setting standards/rules and policies which steer market forces in a certain way, using therefore market based policy mechanisms, because there are many similarities between them. A number of characteristics demonstrate the importance of adopting a holistic vision in the analysis of public policies as follows:

- a) Territories are affected by many policies at the same time;
- b) Regulatory frameworks and direct and indirect types of policies are both relevant to understand the interactions/complementarities/conflicts in the provision of ESBOs;
- c) Public policies can also intervene simultaneously with private schemes in influencing the effectiveness of ESBO provision (and appreciation).

Public policies are thus part of the contextual framework within which we study collective action. Synergies and conflicts between the drivers impacting on ESBO delivery deserve a particular focus while we gather further information in the field. Private schemes (market and non-market-based) are another type of potential drivers and at the same time they can be considered also an outcome of collective action and of the demand for enhanced provision of ESBOs. This implies an in-depth analysis of existing private schemes in the EU.

The third and the fourth important topics (“organisations” and “actors”) are strongly interlinked elements of the SES framework. We tried, on the basis of the scarce information available, to classify 34 cases in order to have some idea of the relative importance of categories of governance in the PEGASUS case studies. In the case studies, action is found to be usually collective, i.e. carried out by multiple actors. On the basis of who takes the lead, we can identify three types of collective action: 1) public policy driven; 2) private actors driven; 3) public-private partnership driven. The latter requires more attention in our research because, despite its greater complexity, it presents interesting and challenging elements of innovation in the structure of collective governance and may require more sophisticated governance rules. More generally, the analysis should be pursued in two directions:

- The distribution of roles/tasks among the relevant actors of the collective action and in particular: who shapes the strategy of the collective action and which kind of alliances allow the provision of ESBOs;
- What kind of formal/informal relationships exist and how informal/formal rules (contracts, agreements, etc.) govern the provision of ESBOs.

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## Annex 1 – List of case studies and principal variables used for classification

#	Case study	Country	Scale	Scale definition	Type of area	Main ESBOs	Types of action	Lead actors	Mechanisms supporting ESBOs appreciation	Mode of governance for ESBOs delivery
1	Organic farming in mountain region Murau	AT-1	30000 inhabitants, 14 municipalities, 1300 farms	Local - medium/large scale	Extensive livestock	Biodiversity and landscape	Private driven-collective action	food chain's actors in partnership	Premium price payment	Direct contracts with retailers under private label
2	Biosphere Reserve Lungau, Salzburg	AT-2	1000 kmq, 786 farms	Local-small scale	Extensive livestock	Biodiversity and landscape	Private driven-collective action	Biosphere Reserve Association	Certification scheme	Informal public-private cooperation
3	Forestry and public goods provision in Pinzgau, Salzburg	AT-3	district of 2640 kmq, 86000 inhabitants, 28 municipalities, 118000 ha forest	Local - medium/large scale	Forest area	Multiple ESBOs	Public policy driven-collective action		Public policy	Formal place of dialogue between private and public stakeholders
4	Biodiversity rich meadows payment	CZ-1	325 ha of protected area	Local-small scale	Extensive livestock	Biodiversity and landscape	Public policy driven-collective action	Nature Conservation Agency	Public policy	Formal agreement between government bodies and NGO
5	Birds and amphibians support on wet meadows	CZ-2	70 ha of meadows	Local-small scale	Extensive livestock	Biodiversity and landscape	Private driven-collective action	NGOs	Private fund-raising	Informal public-private cooperation
6	Forest restoration in the Liberec region: guided succession	CZ-3	62 ha of forests	Local-small scale	Forest area	Biodiversity and outdoor recreation	Private driven-collective action	NGO	Private fund-raising + public policy	Citizens' informal organisations
7	Green Belt Frankfurt	DE-1	80 kmq	Local-small scale	Peri-urban area	Landscape and outdoor recreation	Public policy driven-collective action	Local Authority	Public policy	
8	Traditional orchard meadows in Hessen/Baden-Wuerttemberg	DE-2	2973 kmq	Local-small scale	Extensive agriculture	Biodiversity and landscape	Private driven-collective action	food chain's actors in partnership	Premium price payment	Direct contracts with agri-food industry under private label
9	"Regionalwert AG" Freiburg / Hamburg /	DE-3	13 farms. Regional scale	National/regional scale	Alternative network of farms	Multiple ESBOs	Private driven-collective action	Shareholder corporation	Private fund-raising	

#	Case study	Country	Scale	Scale definition	Type of area	Main ESBOs	Types of action	Lead actors	Mechanisms supporting ESBOs appreciation	Mode of governance for ESBOs delivery
	Munich									
10	Marketing of local, organic and farm food	EE-1		National/regional scale	Alternative network of farms	Multiple ESBOs	Private driven-collective action		Certification scheme + contractual arrangements	
11	Grass-fed beef	EE-2	11 organic farms, from different Estonian regions	National/regional scale	Alternative network of farms	Biodiversity and landscape	Private driven-collective action	NGO	Certification scheme + contractual arrangements	direct contracts with processors, self-organised sales and marketing
12	State Forest Management Centre	EE-3	nation-wide forests	National/regional scale	Forest area	Multiple ESBOs	Public policy driven-individual action	State Forest management centre	Certification scheme	
13	Agriculture and forestry in Pays de Langres	FR-1	Pays, 172 municipalities; 45000 inhabitants; 786 farms	Local - medium/large scale	Intensive agri-industry	Rural vitality and landscape	Public policy driven-individual action	Local authority	Public policy	
14	Volvic water company, management agreements and agri-forestry	FR-2	3800 ha; 60% forest, 30% agric. 4 municipalities	Local-small scale	Extensive livestock	Water and landscape	Private driven-collective action	Water multinational company	Compensations to higher costs in sustainable agricultural practices	Association involving local authorities and the water company
15	Agriculture and forestry in Parc National des Cévennes	FR-3	National Park; 64000 inhabitants, 110 municipalities	Local - medium/large scale	Extensive livestock	Rural vitality and landscape	Public policy driven-individual action		Public policy	
16	Processed tomato supply chain in the Tomato District of northern Italy	IT-1	27 municipalities, 500.000 inhabitants	Local - medium/large scale	Intensive agri-industry	Water and soil functionality	Public/Private partnership driven-collective action	Private-public partnership	Certification scheme + contractual arrangements	Inter-branch Organisation
17	Bergamot, niche and organic products in Calabria	IT-2	12 municipalities, 50.000 inhabitants	Local - medium/large scale	Extensive agriculture	Biodiversity and landscape	Private driven-collective action	group of farmers	Certification scheme + contractual arrangements	Trust relations between farmers' cooperative and agri-food industries

#	Case study	Country	Scale	Scale definition	Type of area	Main ESBOs	Types of action	Lead actors	Mechanisms supporting ESBOs appreciation	Mode of governance for ESBOs delivery
18	Agriculture in natural parks in the Marche region, Italy	IT-3	Natura 2000 site, small area	Local-small scale	Extensive agriculture	Rural vitality and landscape	Public policy driven-collective action	group of farmers	Public policy	Agro-environmental agreements
19	Niche products and tourism in Tuscany	IT-4	16 municipalities, 533 Km <sup>2</sup>	Local - medium/large scale	Extensive agriculture	Rural vitality and landscape	Public policy driven-collective action	Local Action Group; Municipalities Union	Public policy	Union of local authorities; Public-private partnerships
20	Grazing systems in dairy production	NL-1	Cooperative of 500 dairy farmers (Cono Cheesemakers)	Local-small scale	Intensive agri-industry	Landscape and animal welfare	Private driven-collective action	food chain's actors in partnership	Premium price payment + certification schemes	Outdoor Grazing Covenant (dairy farmers' organisation, retail organisations, dairy cooperatives, civic society organisations, government institutions)
21	<i>Farmer, beer and water</i> – sustainable agriculture and sourcing in Limburg province	NL-2	village of Lieshout, network of about 70 farmers	Local-small scale	Intensive agri-industry	Water and landscape	Private driven-collective action	food chain's actors in partnership	Integrated conservation and development project (ICDP)	A formal agreement involving farmers, food industry and water authorities
22	Nature management and regional planning in Drenthe	NL-3	5 villages of province of Drenthe	Local-small scale	Intensive agriculture	Rural vitality and landscape	Private driven-collective action	NGO	Public policy	Formal agreement between Local authorities and NGO
23	Skylark foundation: a farmers' association for sustainable arable farming, supported by supply chain partners	NL-4	Network of farms scattered in the country	National/regional scale	Alternative network of farms	Multiple ESBOs	Private driven-individual action	NGO	Certification scheme	Farmers' organisations
24	Montado extensive silvo-	PT-1	Monfurado Natura 2000	Local-small scale	Extensive livestock	Biodiversity and	Public policy driven-individual		Public policy	

#	Case study	Country	Scale	Scale definition	Type of area	Main ESBOs	Types of action	Lead actors	Mechanisms supporting ESBOs appreciation	Mode of governance for ESBOs delivery
	pastoral system in Portugal		site. 23.950 ha. In two municipalities (Montemor-o Novo- Evora)			landscape	action			
25	Small scale peri-urban mosaic in Montemor-o-Novo	PT-2	Montemor-o-Novo (17.000 inhabitants)	Local-small scale	Peri-urban area	Rural vitality and landscape	Public policy driven-individual action		Public policy	
26	Intensive olive production in the Alentejo	PT-3	Area quite large (854.292 ha), NUTS III level, Baixo Alentejo (30% of Alentejo region)	Local - medium/large scale	Intensive agri-industry	Water and landscape	Public policy driven-individual action		Public policy	
27	Agri-forestry in sub-alpine Slovenia (Upper Savinja Valley)	SI-1	2000 inhab. 21300 ha; 2 municipalities	Local-small scale	Extensive agriculture	Biodiversity and landscape	Public policy driven-individual action		Public policy	
28	Recreation in urban forests in Ljubljana, Slovenia	SI-2	Small scale: 2 municipalities	Local-small scale	Forest area	Public recreation, education and health	Public policy driven-individual action	Local municipality	Compensations to higher costs in sustainable agricultural practices	Informal cooperation between public institutions
29	Agriculture-based development strategies for areas hit by economic crisis	SI-3	11 municipalities	Local - medium/large scale	Extensive agriculture	Rural vitality and landscape	Public policy driven-individual action	Nature Park	Public policy	
30	Nature conservation enabling social security in farming in Središče ob Dravi	SI-4	Small scale, 430 ha	Local-small scale	Extensive agriculture	Biodiversity and landscape	Public policy driven-individual action	Local municipality	Public policy	

#	Case study	Country	Scale	Scale definition	Type of area	Main ESBOs	Types of action	Lead actors	Mechanisms supporting ESBOs appreciation	Mode of governance for ESBOs delivery
31	WILD river basin management initiative	UK-1		Local - medium/large scale	Extensive agriculture	Water and flood protection	Private driven-collective action	NGO	Integrated conservation and development project (ICDP)	Project board including private and public actors
32	Hope Farm with intensive, sustainable arable farming in the east of England	UK-2		Local-small scale	Intensive agriculture	Biodiversity and healthy soils	Private driven-individual action	NGO	Integrated conservation and development project (ICDP)	
33	North Pennines multi-stakeholder partnership for sustainable uplands	UK-3		Local - medium/large scale	Extensive livestock	Biodiversity and rural vitality	Public/Private partnership driven-collective action	Private-public partnership	Public policy	
34	Care farms	UK-4	Network of farms scattered in the country	National/regional scale	Alternative network of farms	Public recreation, education and health	Private driven-collective action	NGO association	Integrated conservation and development project (ICDP)	Contracts between farmers and local authorities