INNOVATIONS BENEFITING HNV FARMING SYSTEMS, FARMERS AND COMMUNITIES

Report of the reviews of existing research and experiences on HNV farming innovations

HNV-LINK WP 2 Deliverable 2.2.1

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1 SYNTHESIS

1.1 Background, objectives and structure of the literature review

This report is an outcome of the Horizon2020-funded project HNV-Link (High Nature Value farming: Learning, Innovation and Knowledge). HNV-Link is dedicated to developing and sharing innovations that support HNV farming systems and communities by simultaneously improving their socio-economic viability and environmental efficiency. The project HNV-Link connects ten areas where HNV farming systems are prevalent and where appropriate innovations have been made. These are the network's so-called Learning Areas (LAs), which span a cross section of Europe: Bulgaria, Croatia, France, Greece, Ireland, Portugal, Romania, Spain, Sweden, and the UK. A Learning Area is a multi-actor cluster of stakeholders such as farmers, professional associations, NGOs, local authorities, and education and applied research institutes. The network's mission is to create a "community of practice and knowledge", in which innovation for HNV systems can be shared and furthered. The report is part of the projects Workpackage 2 (WP2), "Learning innovation from the grassroots". The main aim of WP2 is to find the types of innovation processes that are improving socio-economic viability of HNV farms and communities while maintaining or improving nature values, and the types of innovation that are less successful in this respect.

The objective of this literature review document is twofold:

1) Review the available research across the EU in order to identify the state of the art in the area of innovation for HNV farming, to identify gaps in the research and make recommendations for addressing these gaps;
2) Produce guidance for the project Learning Areas to undertake the assessment of innovation at the grassroots under each theme, in terms of clarifying the concept and content of each theme and by providing some examples from the available literature.

The four innovation themes are structured according to the themes identified by the EIP Focus Group on HNV farming as main drivers for innovation:

1) Social and Institutional: e.g. co-operation between farmers, co-operation of farmers with other local actors, catalysing farmer groups, role of animators, institutions and institutional structures that favour innovation, including co-innovation across different institutional levels (local-national-EU).
2) Regulatory Framework: e.g. legislation that affects HNV farming, processing and marketing, and how it can be designed so that it favours innovation in these areas, and does not hinder innovation.
3) Products and Markets: e.g. development of new products, product processing, adding value, marketing of products from HNV farming systems and areas.
4) Farming Techniques: e.g. reducing costs and increasing efficiency through development of appropriate technologies, farming techniques (including locally adapted), grazing management and monitoring, organisation of labour.

The literature review is performed considering documented experiences, research findings and publications about the main needs and gaps in HNV farming innovation, the main barriers to innovation, and the ways that these gaps and barriers can be addressed. The review focuses on material available in the English language; material in the other national languages will be reviewed infurther project work. For the "gap analysis" some examples of good practice are selected so that they can be considered as potential good examples to be applied or adapted at LA level. Based on the

findings in each of the four innovation theme reviews, recommendations aiming to contribute to the identification, documentation and analysis of HNV farming innovations in the LAs are developed. Following the LA assessments of innovation, the findings from the literature review will be contrasted with the findings from the LA assessments.

The literature review was carried out in the period May – September 2016 by the following HNV-LINK partners:

- Social and Institutional - SLU (leader);
- Regulatory Framework - IT Sligo (leader);
- Products and Market - STEP (leader), UASVM Cluj-Napoca and University of Volos;
- Farming Techniques - ICAAM/UEvora (leader).

The report consist of a synthesis of the literature review (chapter 1) and individual chapters targeting the four innovation themes. The methodology principles and guidance used for the review process are described in section 1.2. Section 1.3 summarises the main findings of the individual thematic reports. Section 1.4 summarises the main recommendations for the innovation identification, description and analysis in the learning areas.

The four innovation themes are focused on in the chapters 2-5: Social and Institutional (chapter 2), Regulatory Framework (chapter 3), Products and Markets (chapter 4), and Farming Techniques (chapter 5). Each of the four innovation thematic chapters begins with a section framing the respective innovation theme. It is followed by a description of the specific features and adaptations to the common review methodology for the respective theme. The main results of the literature review are discussed in a section presenting the types of literature and/or projects found as well as the gaps in research detected. Presentations of practical (best) examples of HNV innovations in the respective themes are provided in a separate section. The key findings from the review of each theme regarding the enabling conditions that made the HNV innovations happen, the success or fail/limiting factors and (where relevant) the recommendations made in the reviewed documents are then systemised. The individual thematic chapters end with our recommendations to the Learning Areas for the identification and description of the HNV farming innovations in the respective theme. Appendix 1 enlists all the publications per theme that were short-listed as relevant for this literature review based on the common methodology and the respective thematic adaptions.

1.2 Methodology

1.2.1 Guiding principles for the literature review

To make a high quality and complete literature review is a very labour intensive process. The aim here is not to achieve this, due to time constrains and the broad fields covered. Rather we are aiming to identify the most important lessons learned and factors that might hinder or support socio economic viability and nature value of HNV farms and communities. Each sub-task leader has made a delimitation based on existing reviews and his/her pre-understanding of the field.

Gall, Borg, and Gall (1996) argue that a literature review usually plays a role in: delimiting the research problem; seeking new lines of inquiry; avoiding fruitless approaches; gaining methodological insights; identifying recommendations for further research, and seeking support for grounded theory. Although these aspects are of interest, the focus of our literature review is somewhat different. Our focus is directed towards *practice*, that is, innovations that will/can help practitioners (broadly defined) to improve the viability and sustainability of HNV farms and farming communities. The delimitation is

more normative in the sense that what is *desirable* and *feasible* is in focus. Also, the factors identified will be contextual in a larger extent than in traditional literature reviews, that is, universal findings are of course important, but as important for us might locally adapted and emerging findings be. It is very much linked to the perspective of *best practice*.

Based on Cooper's (1998) "Taxonomy of Literature Reviews" one can classify a literature review according to five characteristics: *focus, goal, perspective, coverage, organization*, and *audience*. Our literature reviews should be classified as follows:

Focus: Practices or applications (as compared to e.g., research outcomes or theories)

Goal: Identification of central issues (as compared to e.g., criticism or integration)

Perspective: Espousal of position (as compared to neutral representation)

Coverage: Representative through purposive or strategic sample (as compared to e.g., exhaustive)

Organization: Conceptual format (as compared to historical/chronological or methodological)

Audience: Practitioners and policy makers (as compared to e.g., specialists or general public)

As a consequence, the *sources of information* are broader than traditional literature reviews. Relevant material can be found in:

- Research reports and articles
- Official publications and reports – assessments, case studies, others, by EC, ENRD, etc.
- Practice publications and reports – NGO-reports, farmers' associations' reports, etc.

Each subtask-leader decided which literature is most relevant within each innovation theme. The most relevant literature and case studies are gathered from different sources based on what kind of innovations we talk about.

Furthermore, the literature review is motivated by practical concerns, which mean that it should be very clear what those concerns are, why they are important, and how our investigation addresses those concerns. This will legitimize the literature reviews, the delimitations made and our choice of data sources.

The above produced the following guidelines for doing the review.

Temporal frame: Literature and studies presented between 1992 (Rio Summit) and 2016, bearing in mind that the term HNV farming was first used in 1993.

HNV farming system frame: We frame our literature review process working with the HNV farming systems typology used in the EIP-Agri HNV farming focus group:

- Livestock dominated production systems
- Arable dominated production systems
- Permanent crop dominated production systems
- Mixed production systems and mosaic HNV landscapes

Language frame: At this stage of the literature review, we only look for reports and publications in English language to maintain consistency within the findings. The team agreed that the available HNVf innovation literature in the national languages (other than English) would be reviewed by the LA teams in the process of identification and description of HNVf innovations at LA and national levels.

Different innovations are not equally relevant for every HNV farming system, as well as for the socio-technical and cultural differences between the learning areas (LAs). Therefore, at the beginning of the review process we have an open-mind and create a broad compilation of innovations to capture relevant farming situations where the HNV term has not been used before sorting out what is/what is not relevant. This is also important for the transparency and consistency of the review process, as well as for the project as a whole. Thus, the following common set of supplementary terms that are specific to the four HNV farming types are agreed:

Main terms	Supplementary search terms
HNV farming	Extensive agriculture/farming Low-intensity agriculture/farming Marginal agriculture/farming Sustainable agriculture/farming Organic agriculture/farming Traditional farming
	Habitats Mountains/mountain agriculture/farming Natura 2000 Landscape Ecosystem services
Livestock dominated production systems	Extensive grazing Semi-natural grasslands Permanent pasture
Arable dominated production systems	Low-intensity Extensive Fallow Traditional
Permanent crop dominated production systems	Low-intensity Extensive Terraces Traditional
Mixed production systems and mosaic HNV landscapes	Mosaic farming Small-scale farming Agroforestry Perennial agriculture

1.2.2 Sampling and data analysis

For each innovation theme (products and markets; farming techniques; social and institutional; and regulatory framework), there is a specific guidance (as prepared by each sub-task leader and

discussed jointly). In these documents, the main topics are listed, with examples of what might be interesting to look for in the review process. These theme-specific guidelines are instrumental when delimiting and focusing the attention of the review process.

One of the first steps in each theme-specific literature review is to define the key words used when searching for studies and/or data. That is, each innovation theme will consist of sub-themes involving specific key words. The trick of the trade is often to combine search terms in a way, which delimit, but at the same time focus the search process towards the most relevant literature.

Different methods can be applied in order to find relevant data. When working with many different sources of information an additional challenge is to find relevant studies, especially the ones, which are more policy and/or practice oriented. For the research reports and scientific articles the main method are scientific search engines, earlier review studies, and cross-references. For the official publications and reports – often labelled grey literature – the main method are literature that is found through HNV-Link network, national and regional authorities, studies conducted in our Learning Areas, the EIP-AGRI Focus Group "HNV farming profitability", reports from other linked EU-projects (such as SOLINAS, PRO-AKIS), EFNCP, as well as from the European Rural Network.

Agreed search engines:

1) Scientific literature - Google Scholar; Web of Knowledge; Science Direct; JSTOR; www.environmentalevidence.org;
2) Grey literature - Google; European Commission website; European Network for Rural Development; etc.
3) Snow-ball sampling

There are different ways of structuring and analysing the data collected. One common way is to use the key-words used to collect the data, as a way to also structure the findings. Another way is strictly to follow the "main topics" identified in each thematic literature review. There will always be emerging themes or new combinations that need to be elaborated and described in the final report.

The result of the review and analysis ("key lessons and gaps") of existing innovations will feed into the next phase of the process. By collecting and evaluating innovations as tools for the development of HNV systems we will be able to produce a full inventory of grassroots innovations, based on both studies and practical experiences in the Learning Areas. So, the practical value of the literature reviews is put to the fore, and guide the data analysis and reporting of the reviews.

1.3 Summary of the main findings

The first objective of the literature review was to review the available research across the EU in order to identify the state of the art in the area of innovation for HNV farming, to identify gaps in the research and make recommendations for addressing these gaps.

In total, the teams identified 540 publications relevant to four innovation themes of the project (Figure 1.1), of which 303 were short-listed for detailed reviews (Figure 1.2). Most of the short-listed sources of information are in the Markets and Products theme (48%), followed by the ones in the Regulatory Framework (28%). Less information is identified in the Farming Techniques (17%), and Social and Institutional (7%) themes. This is result is not particularly unexpected since the solutions to the

challenges in HNV farming are often sought in improving the existing policies and developing new market opportunities for the products from the HNVf systems.

Figure 1.1.

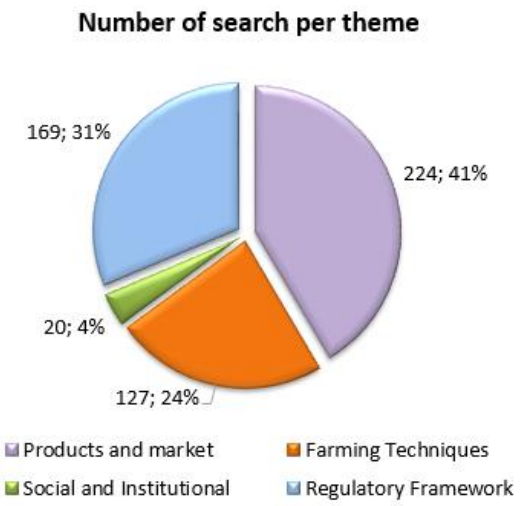


Figure 1.2.

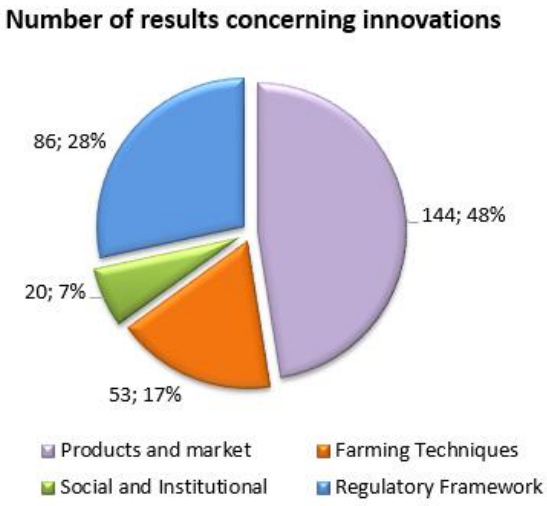
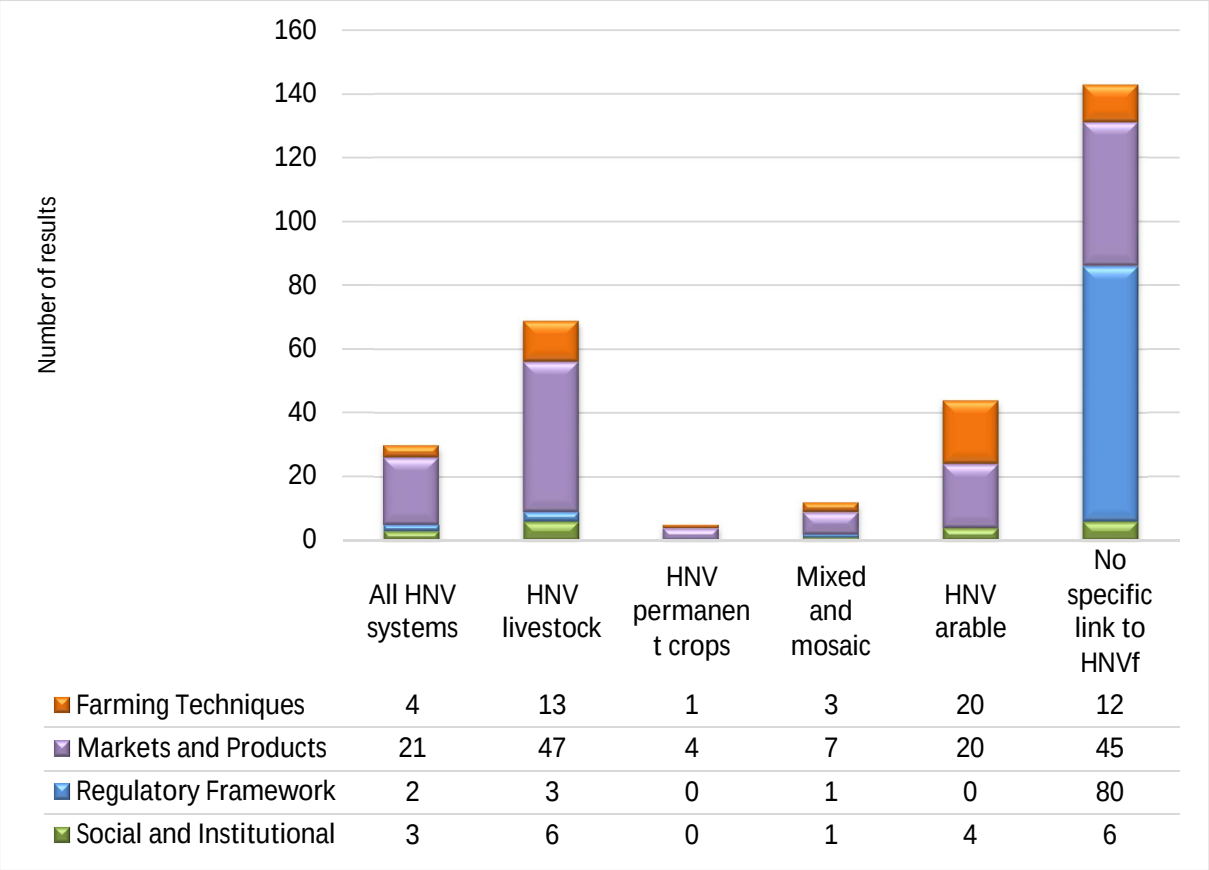


Figure 1.3. Literature review results per Innovation theme and per HNV system



The literature review was framed to search deliberately for innovations relevant to the four HNV farming systems – livestock, arable, permanent crops and mosaic and mixed systems. However, almost half of the short-listed sources in all innovation themes (148 out of 303) were actually not relevant to any of the HNV farming systems (Figure 1.3). This is particularly valid for the Regulatory Framework sources; where only six out of 86 were related to some of the HNV systems. From the other half of the short-listed sources, 69 were on HNV livestock systems and 44 on HNV arable systems. The publications specifically focused on HNV permanent crops and HNV mosaic and mixed systems are only a few – 5 and 12 respectively. There was another set of short-listed publications – 30, which were referring to HNV farming systems in general. For HNV livestock systems, most of the publications are on the Markets and Products themes, followed by the ones on Farming Techniques themes. In the HNV arable systems publications, the publications on the two themes are equal.

The main findings can be summarised as following:

1. Limited scientific focus on HNV farming systems in the four innovation themes:
   - There are very few scientifically reviewed studies in all four themes, which directly focus on the challenges facing HNV farming systems.
   - In general, social and institutional innovations are well described and analysed in the literature, but not in the specific context of HNV farming. This is not a problem while a majority of social and institutional innovations in agriculture are relevant for most contexts. However, it indicates a research gap in the case of HNV farming specifically.
   - The current policy impacts on HNV farmland are discussed in only a few of the reviewed publications (six out of 86). Much of the research available investigates potential scenarios with very little analyses of existing policy measures on different farming systems.
   - Very few of the reviewed publications actually discuss directly HNV markets or products. In reality, most of the HNV markets/products experiences are from Bulgaria (Dzhabarova, Peneva, 2014, Peneva, Kazakova, 2015) and Romania (Akeroyd, Page, 2011, Popa, 2010, 2015, Stanciu, 2012); some reference is made to the concept of HNV farming in the discussion of local food in the UK (Winter 2005). There is still a significant gap in the scientific research and publications that are specifically focused on Markets and Products Innovations in High Nature Value farming systems.

2. Geographical "clustering" is observed in some of the innovation themes and sub-themes:
   - There are some research environments and countries that seem to dominate the scientific literature in the social and institutional innovations. Although these developments take place all over European agriculture, it is clear that the more of the theoretical development of this field of research are done at some specific centres, especially in the field of farming and learning systems and innovation systems.
   - We observe a kind of clustering of studies/publications and countries on certain sub-themes in the Markets and Products Innovations that are potentially relevant to HNV farming systems: For example, many of the French publications are on PDO, and very little of them are on HNV farming. In Spain, there is a focus on pastoral livestock systems as well as PDO but again less on HNV. On the contrary, in Bulgaria and Romania, there is a focus on HNV farming and direct sales, but almost none on PDO.

3. HNVf innovation literature is so far dominated by "wishful thinking" than practical experiences
   - In many of the publications, where we had a search match between "HNV farming systems" and social and institutional innovations (and linked key words), we found strong arguments about the need for such innovations in order to enable more sustainable farming systems.

Consequently, a big share of the literature just mentioned social and/or institutional innovations as being necessary, but did not elaborate on it further. We know what is needed, but not how to do it.

- The markets and products and regulatory framework teams also experienced "wishful thinking" in the reviewed publications, for example "in order to preserve this HNV system, it will be good to develop local markets and direct sales, to add value to products and to increase farmers' incomes…" or "in order to preserve this HNV system, it would be good to link more tangible environmental outcomes to Pillar I payments".

4. The four innovation themes are interlinked in the theoretical discussions and overlapping in the case study experiences:
   - There is an overlap between the innovation themes – in the discussion of social and institutional innovation the purpose is sometimes to develop new markets, products, technologies or even to change the context (e.g. the regulatory framework). Furthermore, some of the social and institutional innovations are argued to enable further social and institutional innovations (or each other – social innovations enable institutional innovations and vice versa).
   - In the discussion of Markets and Products Innovation often the enabling conditions and/or factors that need to be improved are related to social and institutional (social cohesion, cooperation between producers and consumers); regulatory (hygiene requirements, subsidies, etc.) and technical factors (adaptability of techniques and equipment to small and medium-size producers.

5. Theme-specific findings:

   Social and Institutional Innovations

   - There is a strong theoretical foundation when discussing social and institutional innovations in agriculture today. Many of the social scientists in this field belong to the research community in "farming systems", where a need to transform the governance principles for agriculture has been identified in order to create a sustainable knowledge system. The approach is often characterised by a collaborative perspective on learning, change and innovation, emphasising not only a bottom-up approach but rather a multi-stakeholder approach for sustained change to take place.
   - It is important to realise that most of our understanding of social and institutional innovations is described in general terms, often presenting factors that need to be taken into account (although being grounded in empirical work). This might be seen as a problem for the development of guidelines for assessment or concrete initiatives in a specific HNV-farming context. But the argument here is that it is not.

   When it comes to social and institutional innovations most important is to have certain functions of a social system in place. Take the example of facilitators; the literature clearly argues for the need of trained facilitators to support the development and implementation of social innovations. But <u>exactly</u> how these facilitators will work (together with and in front of people) is an open question. A facilitator can choose the level of participation, can use different methods and tools to manage specific situations (the tool box) and are of course different when it comes to their communicative style. This results in individual variations, but where some guiding and general principles for what make facilitation successful is described. This is a general conclusion, but still highly relevant for the future development of HNV-farming.

Regulatory Framework Innovations

- There is a significant amount of literature that provides a commentary on what changes should be made to existing policy to improve it with a high proportion of this type of literature coming out in the run up to new CAP cycles.
- There is wealth of literature that discusses the impacts of Pillar I direct payments and Pillar II rural development policy, along with suggestions on how they may be improved. The recommendation to strengthen the Pillar I payments links with the delivery of environmental public goods for agriculture in general is very prevalent. The call for more targeted Pillar II payments that deliver for HNVf in particular is also prevalent. There is a paucity of publications on how other regulations affect HNV farming but where they do exist they refer to marketing in particular and occasionally to animal identification and health.
- OECD (no date) states that regulatory reform brings benefits in terms of reducing costs, enhancing efficiency and stimulating innovation and must be implemented without jeopardising the original objectives whether they be ensuring fair markets, environment protection or maintenance of government oversight of private sector activities. The main problem in the review of the agriculture regulatory framework in relation to innovation and HNV farmland is that HNV farmland is a peripheral issue in the CAP reform process (with the exception of inclusion within EU Rural Development Policy priorities where there are also many other competing priorities). As such it is lost in the wider reform process.

Markets and Products Innovations

- The publications focused on market innovations or alternative markets such as short-food supply chains, farmers' markets or community supported agriculture are significantly more, and describe both the theoretical background and case studies of actual implementation. They focus mostly on benefits to consumers and/or producers; while where environmental benefits are specified, they mostly refer to carbon emission savings. The potential benefits to HNV farming systems are not defined. This is another gap in the literature, which potentially can be addressed after the identification and assessment of Markets and Products Innovations in the HNV Link ten learning areas.
- The regional variations in the uptake of innovative (alternative) market approaches is most likely a reflection of the embeddedness of the respective theme/sub-theme/concept at national level. There is also a historical aspect of the observed clustering, since the use of geographic indications, in France especially, precedes the official adoption of HNV farming concept at EU level; while in Bulgaria and Romania, the alternative marketing approaches are promoted by organisations also promoting HNV farming systems.

Farming Techniques

- Most references identified within farming techniques and management innovation theme relate to case studies where reports and/or analysis of different management approaches are presented. Furthermore, reports where techniques and best practices which are not exactly innovative, are suggested for particular situations, were here considered also as "examples of innovations".

1.4 Recommendations to the project Learning Areas on searching for innovations

The second objective of the literature review is to produce guidance for the HNV-Link project Learning Areas to undertake the assessment of innovation at the grassroots under each theme, in terms of clarifying the concept and content of each theme and by providing some examples from the available literature. A summary of the recommendations is presented here, while the detailed recommendations are available in each of the thematic chapter.

It is important that the description of the HNV innovations in the LAs follow the template provided to ensure coherence and comparability between them. The recommendations provided in this section reflect the findings of the literature review and aim to help work on the innovations at local/regional level. They should be treated as having an orientation and guidance function as opposed to a step-by-step instructive role.

Having in mind the identified overlaps between the innovations themes in the four thematic reports, the literature review team agreed that the Social/Institutional and Regulatory themes are setting the contextual background and overall framework in which then the Market and Techniques as well as Social/Institutional and Regulatory innovations can take place. Having a good understanding of the social process and dynamics and existing regulations is thus of particular importance for identification of innovations in all four themes.

1.4.1 Recommendations on the Social and Institutional Innovations

One argument made in the reviewed case studies as well as in theoretical contributions regarding social and institutional innovations is that a process perspective is necessary. This does not mean to work ad hoc or without plans, rather the contrary. Someone once said that 'nothing is as planned as an open and participatory process', meaning that one has to have a process design and a preparedness for what is supposed as well as what might happen over time. Flood (1999) describe the entrance point to social, complex processes as "balancing *mystery* with *mastery* means living somewhere between the hopelessness of the belief that we are unable to understand anything and, at the other extreme, the naivety of the belief that we can know everything". Social and institutional innovations are very much about balancing between a similar and perpetual dilemma of implementing best available knowledge (contextual and de-contextualized) while at the same time letting people's values and ideas influence the outcome (social acceptance and sustainability). To be able to manage and facilitate such processes one has to be ethical alert, systems- and self-critical, entrepreneurial and constantly focus on experiential learning and concrete measures for making progress.

In Figure 1.4, we describe how a general process design might look. It starts with creating as good pre-conditions as possible by planning activities. The challenge being that one has to work with complexity and conflicts due to multiple goals. Participatory approaches are necessary to find common ground and procedural consensus. Initially one often has to build local capacity, both through public education and by experiential learning, while it is also about a better understanding of the landscape in which you live and work. By these activities, if facilitated in a good way, stakeholders will build trust and stronger relations. This will enable them to develop their co-operation and together innovate, developing products, markets, techniques, etc. Central to this is funding and developing new business models. Being successful it might result in an increased interest from public and

regional/(inter)national authorities, resulting in public-private partnerships and supportive policies enabling scaling up and out of the innovations made. As a potential outcome (or innovation in itself) this process has resulted in new institutions which are better prepared to manage and sustain HNV farming systems, or as the Nobel prize-winner Elinor Ostrom put it 'it takes complex institutions to manage complex processes'. This and similar process designs will probably have a better possibility to improve the social sustainability and economic viability of HNV farms and communities, compared to existing activities and incentives.

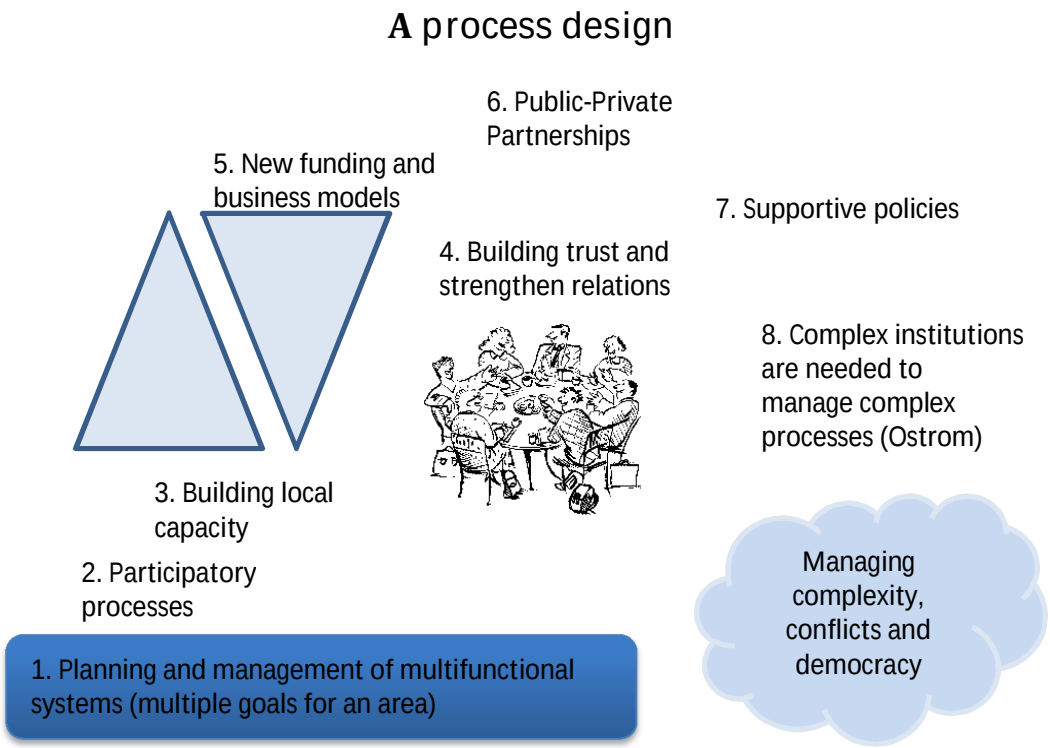


Figure 1.4. Social and institutional innovations can both be a whole process design or part of an overall process. The figure illustrates a general process perspective on social and institutional innovations that can be recognised in many case studies all over Europe.

Recommendations: Basic innovation behaviour to be identified

The relational dimensions

While HNV farming systems are overtly about substantive matters, progress on them often hinges on the quality of the relationships that exist among actors and stakeholders. Consequently, although assessment can begin at any part of socio-ecological systems, in many cases examining whom the stakeholders are and the relationship between them may be insightful. The relational dimensions include stakeholders involved and their history with one another. It also includes the "intangibles" of any complex social situation, such as trust, respect and legitimacy. The following questions may help in the assessment of the relational dimensions of a policy conflict.

1. Who are the stakeholders?
2. Do any stakeholder have unique status (e.g., traditional rights)?
3. What are the stakeholders':
   - Stated positions?
   - Interests (concerns, fears. goals)?
   - Worldviews and values?

4. What are the stakeholders' relational histories?
5. What are the stakeholders' incentives to:
   - Change existing situation?
   - Collaborate?
   - Compete?
   - Learn?
6 What are the stakeholders' best alternative to enter a collaborative process (do they reach their goals easier by not collaborating)?
7. Is trust sufficient? Can it be built?
8. Can representatives/individuals among the stakeholder groups work together?
   - Are representatives available for the long-term or likely to change?
   - Are representatives restricted by constituents?
9. Do the stakeholders have adequate knowledge and skills?
   - To process information and develop a systemic thinking?
   - To communicate constructively and work through potential disagreements?
   - To interact with acknowledgement and respect?

The procedural dimension

Procedural dimensions include those elements that pertain to the ways in which social and institutional innovations are managed and how decisions are made. It also includes the rules, both regulative and generative, that stakeholders adhere to in working through complex issues. Just as progress on the substance relies in part on relational factors, so too does it depend on that procedures are regarded as appropriate and fair by stakeholders. The following questions can guide assessment of the procedural dimensions in all four innovations themes, despite the example being on social/ institutional:

1. At what stage is the social or institutional innovation?
2. Which legal constraints impact the innovativeness of the process?
3. Who has jurisdiction to enable real change?
4. What management approaches have been used in the past (procedural history)?
5. Is mutual learning desired by key actors?
6. What is the decision space, that is, how can participant influence final decisions?
7. Are resources sufficient (e.g., time, funding, competence)?
8. What are the procedural alternatives? How accessible are they? How inclusive?
9. Are there needs for an impartial party to take responsibility for process design and facilitation?

The substantive dimensions

Substantive items are the "tangible" aspects of social and institutional innovations, such as the issues about which stakeholders have a common interest in. Substance, though, also includes issues that stakeholders may consider "symbolic," such as changing power asymmetries. The following set of questions offers a framework for assessing substance:

1. What are the issues?
   - What are the tangible issues?
   - What are the symbolic issues?
2. What are the likely sources of tension over these issues (e.g., facts, culture, history, jurisdiction, values, interests, people)?
3. Are issues complex (technical, expert dependent, experiential, etc)?

4. Is information needed? Is it available?
5. Are meanings, interpretations, and understandings quite varied among stakeholders?
6. What are the mutual gain options (opportunities for mutually beneficial improvements)?

The importance of social capital for social innovation

Social capital has a potential of enabling cooperation based on mutual trust and shared norms and values in a LA. Social and institutional innovations come into being through social interaction and learning processes consisting of identifying social needs, creating new solutions and their implementation. This is why many development processes involve social capital and learning. The more traditional modes are based on personal contacts between different stakeholders. In newer ones, communicative skills and a will to learn to manage complexity plays a much more important role. Assessing new forms, roles and interlinkages of social capital and knowledge, and their contribution to innovative solutions might therefore be relevant. Questions to consider include:

1. What are the local/regional relationship between social capital and social innovation?
2. What examples of traditional and new patterns of social innovation exist?
3. Can social capital be strengthened to sustain new solutions to the existing challenges?
4. What learning modes and knowledge sources does stakeholder use; in particular, what is the role of local, tacit, informal knowledge and social learning in the LA?
5. How are social innovations, social organisation and knowledge and learning processes interlinked with the dominating agricultural and rural governance and knowledge structures?

1.4.2 Recommendations on the Regulatory Framework Innovations

As a first step the regulatory framework needs to be outlined for each LA in the Baseline Assessment made under the Workpackage1. An overview of the HNV Regulatory Framework at EU level is available (see Annex 1) which can be used as a guide for LA co-ordinators for the regulatory framework innovation assessments. Within this overview document there are links to various country reports and MS specific information that can be used during this Baseline Assessment. The regulatory framework should be described under eight sub-themes i.e. Direct payments; Marketing of agricultural products; Rural development; Food and feed hygiene; Animal health and welfare; Plant health; Agriculture and environment; Research and innovation. LA co-ordinators should also identify any challenges/issues/opportunities within the regulatory framework for HNV farmland.

For the innovation assessment, the LA co-ordinators should focus on identifying if their authorities have utilised any flexibility within the policy framework to target support/initiative at HNV farming systems and/or areas. Some of these could be considered HNV Regulatory Framework Innovations or the beginning of the HNV innovation process. For example, has the MS used voluntary coupled support to combat land abandonment on HNV farmland; are there innovative measures targeted at HNV farming in your RDP; is there flexibility in implementation in rules in relation to food hygiene for micro-enterprises; are derogations to animal identification system utilised; are there relevant research and innovation projects in LA e.g. LIFE, INTERREG, H2020, other national funding?

Recommendation: Defining the impact of the HNV regulatory framework innovations at LA level

The impacts of the regulatory framework at LA level on HNV innovations might be best described in summary form as a table. You should consider the regulatory framework and how it relates to HNV

innovations across the other three themes i.e. markets and products; farming techniques; social and institutional (Figure 1.5).

Figure 1.5. The regulatory framework should be considered under three main headings and the contribution made to HNVf innovations should be assessed as above

Then under the regulatory framework headings for each LA (described in the Baseline Assessment) the LA team should assess along a 5 point scale (from active enabler to active barrier) how the regulatory framework applied in the LA is compatible with enabling an HNV innovation process within the LA. This exercise might be best undertaken as part of an expert group meeting/workshop in the learning area. All eight themes may not apply to each LA but it is important that each of those that do apply are listed.

1.4.3 Recommendations on the Markets and Products Innovations

Geels (2004) states that socio-technical systems do not function autonomously, but are outcome of the activities of human actors, who belong to certain networks and societal groups defining and guiding their activities, perceptions, problem-agendas, norms, preferences, linkages and interrelations. Within the societal groups members use a particular language (linked also with the education, books, web-sites, journals they read etc.), have similar stories of their past and vision for future, specialization and share common historical facts etc. It is very important to identify those actors, both farmers and non-farmers, individuals and organisations (e.g. universities, advisory services, credit institutions, governmental authorities, local authorities, R&D departments, NGOs) involved in the HNV innovation.

Recommendation: Understanding the background, capacity and role of the innovation actors for market/product innovations
In this regard, the following information (which should be collected in WP1 Baseline Assessment of the HNV-Link project) is needed at LA level to define the different actors, their roles and the possible influence between the different actors' networks:

- Socio-economic characteristics of the individuals (age, education /training, sex, connections with the territory – relatives, friends, etc.) and/or of the group of farmers;
- Characteristics of the farm/s: ownership on the farm assets (inheritance, newcomers), size (semi-subsistence vs. market oriented; advantages and disadvantages of the HNV farms, e.g. small have more flexibility and responsiveness but have difficulties to generate investment capital; level of management, labour force skills), production practices (extensive, intensive, organic, HNV other, combinations), production structure (including outputs: raw materials and/or process products), sales (market, barter with relatives/neighbours);
- Existence of knowledge about agriculture and effects of the production on nature; e.g. farming in protected areas, what skills are required for farmers to manage it?
- Awareness about biodiversity importance both in terms of environmental sustainability and system productivity and the potential synergy effects; Do farmers interact with external/third parties about this; which are they and how the interaction happens?
- Awareness on and importance of consumer preferences, health protection etc. How much time and money farmers spent to understand them. Do farmers interact with external/third parties about this; which are they and how the interaction happens?
- Formulation of common vision for the future viability of the innovation (or how different are the visions of different actors)?

Recommendation: Understanding the life-cycle of the innovation

Kemp and Pearson (2007) define innovation as ongoing process as the actors, groups and networks are defined by their (relative) temporal and spatial stability. Innovation continuation and diffusion is influenced by advances in (internet and communication) technologies, changes in market or consumers' preferences etc. and farmers' ability to further improve their product/s and/or marketing processes. New uses and users may be found during the diffusion phase, which may lead to new characteristics of the innovation (Kemp and Pearson, 2007).

Identification of the time span and the phase of development are important because the innovation could be influenced by the farm business cycle, the lifecycles of farm products, cultural and societal movements etc. Thus, the analysis of the drivers and barriers for the innovation should be as deep as possible. Information that can help the description of the life stage includes:

- Starting year, in order to identify the speed of the innovation development;
- Dynamics of the system and changes at farm level – is it kept the same, is it an adaptation, a redesign or absolutely new system implementation, etc.

Recommendation: Understanding the state of the art for market innovations in the LA

It is important to identify (changes in) the market actors, relations and interrelations between and within them and their networks. The necessary information required for it relates to:

- Marketing channels (how farmers interact with the suppliers and consumers, e.g. joint deliveries, marketing cooperatives, farm/internet direct sales, fairs, local shops/restaurants etc. and how it has changed? In this respect, how marketing costs have changed? (if there was a change))
- Has a process of diversification taken place? For example, additional processing and/or tourism related activities development. Horizontal value added? Are there any vertical value added activities: cooperation through the value chain with other actors?
- Have farmers started marketing activities such as promotion and information dissemination? What type of channels is used? What is the importance and costs for each one?

- Role and importance (including costs) of the different actors in the advisory system (governmental/nongovernmental)? Role and importance of research/educational institutions? If there are no interactions/relations with advisors/trainers/researchers, why?
- Change in farmers' role and positions in society (positive externalities). Understanding about the "price" or "costs" of ecosystem services; both for food and non-food products and service provision.

Recommendation: Defining the impact of the HNV market innovations at LA level

Boons et al. (2013) claim that sustainable development requires radical and systemic innovations. A review by Montalvo (2008) presents a considerable amount of knowledge on what drives sustainable innovation at the firm level in the industry and services sectors. However, there is less knowledge about how sustainable innovations can be realized in the farming sector and how it can be profitable and/or viable for the actors involved in the process – from farmers to consumers. Therefore, defining multiple benefits from HNV systems for both sides and identifying the needs for faster diffusion of innovations within them is an important question of the project. In this regard, farmers and consumers' assessment of the benefits are needed as well as an assessment of the incentives that would foster their activities.

1.4.4 Recommendations on the Farming Techniques Innovation

In some combinations of search terms used for the literature review, although a significant number of hits were registered, no relevant references of innovation on farming techniques and management, were identified. This might be the result of absence of innovations reported and described within that particular field or it might be a result of the use of "inappropriate" keywords. In the first case, the absence of reported innovations as such could be due to the fact that processes of "soft" innovation (or "hidden innovation") as described by Madureira et al. (2013) are not identified as innovations on farming techniques and management. Although these processes (which rely mostly on the role of human resources, interactions with markets and building of networks (Madureira et al., 2013)) contribute to the development of innovative production methods, they are not identified as farming techniques and management innovations. Therefore the integration of the various dimensions of innovation (Markets and products, Farming techniques and management, social and institutional and regulatory framework) within the HNV systems is crucial for the identification of innovation examples and also gaps within these systems. This integration will probably be easier to achieve within the LA grassroots learning process.

INNOVATIONS BENEFITING HNV FARMING SYSTEMS, FARMERS AND COMMUNITIES

2 SOCIAL AND INSTITUTIONAL INNOVATIONS

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2 SOCIAL AND INSTITUTIONAL INNOVATIONS

2.1. Framing of the theme

HNV-Link project regards Social and Institutional innovations as initiatives and activities that improve the social sustainability and economic viability of HNV farms and communities. Social and Institutional innovations might both be outcomes of such new initiatives but also be necessary pre-conditions for other innovations, such as development of new markets or application of new technologies. That is, social and institutional innovations can both be a means as well as a goal broadly speaking (see definitions of the terms below). The focus areas (sub-themes) and key words of the Social and Institutional innovation review are based on the project description and the experts experience in the theme. They were reviewed, discussed and validated during meetings by all participants in the review process (EFNCP; STEP; UASVM Cluj-Napoca; University of Volos; ICAAM/UEvora; SLU; IT Sligo).

It is increasingly recognised that in order to manage complex socio-ecological challenges society requires learning processes for systemic governance transformation (Leeuwis, 2002, Pelling and High, 2005, Wals, 2007, Ison et al, 2007, Hounkonnou et al, 2012). At the core of these transformations lies social and institutional innovation. But although it has been argued for many years that new approaches for sustainable governance is needed it still remains poorly understood. There is undoubtedly an emerging praxis, but still little is known about how policy makers, practitioners and researchers together can learn their way out of social and ecological dilemmas (Tschakert and Dietrich, 2010; Ison et al, 2011; Powell et al, 2014). This is also true for HNV farming: The need for social and institutional innovations has been defined, but less is empirically documented as successful cases in the literature although there is a lot of experimentation on local and regional level going on.

Many authors claim that optimizing current systems by means of incremental innovations of system components is not enough. Instead, they argue that fundamentally changing current unsustainable systems calls for system redesign and radical innovations of different kinds (technical, organizational, social) throughout the agricultural production systems and supply chains (Grin et al., 2004; Bos et al., 2009; Elzen and Wieczorek, 2005). A multi-stakeholder approach is called upon to support such system (re-)design and radical innovation processes. Shared visions and new concepts can have a guiding, binding, convincing, and uncertainty mitigating function in radical innovation processes (Berkhout, 2006; Beers et al., 2010). What is emerging is a re-configuration of existing knowledge and innovation systems within agriculture (see f.i. Pro-AKIS). Röling and Jiggins (2000, pp 242-246) describe a knowledge system as a mental construct, which may be described as an actor network which support (or not) agricultural innovation and learning, and comprising all actors having a stake in the issue. At the very core of such agricultural knowledge and innovation systems (AKIS) lies new social processes and institutional structures. *Consequently, one might argue that we need social and institutional innovations (eg., new knowledge systems, including multi-stakeholder approaches and local, social organization) in order to enable future social and institutional innovations as well as market, product and technological innovations.*

In the EIP Focus Group on HNV-farming several dimensions of successful social and institutional innovation was identified and described. A terminology used to capture much what was identified as success factors was to talk about “networking and cooperation”. This covers many different potential actions and initiatives at farm, household and community level; “actions ranging from informal, ad hoc collaboration between individual farmers, through various forms of networking, to formally-

constituted partnerships with legally defined structures and mandates. All of which might exist for a broad range of purposes, including coordinating access to information, sharing skills, experience and resources (including addressing workforce issues), buying inputs, branding, processing and marketing products, cooperation for nature stewardship, lobbying national/regional authorities etc." The focus group also concluded that even though the forms often varies between contexts, there still are some common characteristics, such as the establishment and building of solidarity (i.e. acting together in pursuit of a common objective for mutual support and/or benefit).

Furthermore it has been stressed that there is a need for both horizontal and vertical collaboration/co-operation (Ljung, 2001; Murray et al, 2010). In practice this means that collaborative initiatives are taken a) horizontally on local level (such as farming communities) or regional level (between stakeholders acting on the regional arena to create better pre-conditions for HNV-farming), as well as b) vertically between systems levels, that is more broadly between for instance farmers and other partners such as citizens, consumers, policy makers, and professionals/agencies all with an interest in HNV sustainability. Of course, successful development of cooperation amongst HNV farmers as well as in multi-stakeholder groups depends upon factors like the quality of communication, level of participation, degree of learning, how relations and trust are developed, etc. This is all necessary for collective action. This (usually) does not happen by itself. What is needed is process support, conducive policy environments, good enough pre-conditions, etc. This means that other actors must be involved that can facilitate the work in order to create real improvements of complex situations, which also involves multiple goals and different interests. The EIP Focus Group on HNV-farming concluded that external support could be essential for promoting cooperation, as well as overcoming the various fail factors that limit the development of HNV farms.

This field of HNV-farming involves existing and potential social and institutional innovations of many forms. If handled correctly social and institutional innovations have a potential to incentivise the delivery of high levels of social and ecological values and services from HNV-farming. Examples include co-operation between farmers, co-operation of farmers with other local actors, catalyzing farmer groups, role of facilitators, institutions and institutional structures that favor innovation, including co-innovation across different institutional levels (local-national-EU). Institutional support and economic/legal incentives for these kind of processes include voluntary contracts, payment for environmental services, land stewardship, environmental compensation, etc. or support for institutional innovations such as locally led programs, monitoring, national and local partnerships, etc. And as said, these are also required to enable wider adoption of other innovation processes. Here we see an overlap between what could be labeled as institutional innovation and what could be defined as innovations on the regulatory framework as well as market innovations.

Ljung and Nordström Källström (2013) have summarized some of the most important social and institutional factors in social/collaborative learning processes for sustainable management of natural resources (Figure 2.1). The model shows that both external and internal pre-conditions for collaborative work as well as specific process qualities and activities must be taken into account. The analysis of empirical cases has shown that there is a threshold for each factor to reach final success (Ljung and Nordström Källström, 2013).

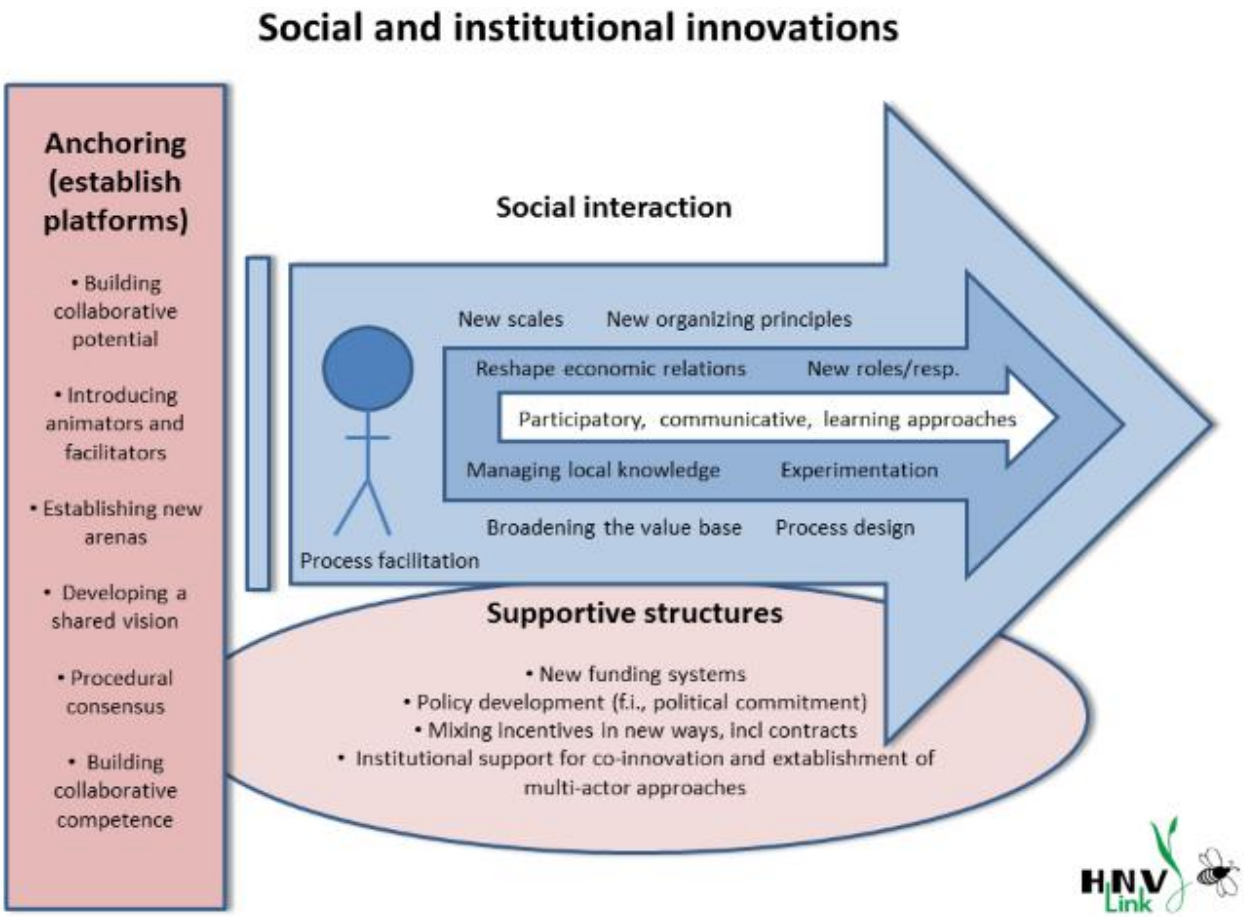


Figure 2.1. Social and institutional factors influencing the outcome of collaborative processes in natural resource management and in HNV farming systems (from Ljung and Nordström Källström, 2013).

2.1.1 Defining social innovation

The European Commission (2014) defines social innovation as "innovations that are both social in their ends and in their means". They cite the Open Book of Social Innovation explaining that "Social innovations are new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations" (Murray, et al 2010, p. 3). Bosworth et al (2016) compare possible social innovations with the Schumpeterian approach to innovation (Table 2.1). In this perspective social innovations overlap with other categories of innovation, but is also described as a precondition for innovations in general (Moulaert et al, 2013).

Table 2.*1.* Applying a Schumpeterian approach to social innovation (Bosworth et al, 2016).

Schumpeterian innovation	*Social innovation*
Product	New outcomes: new businesses, organizations, services or products
Process/methods of production	New approaches to value creation and policy/service delivery, new people involved and shifting control of processes
Exploitation of new markets	Serving the breadth of society; responding to social needs (local demand)
Inputs	Maximizing the use of local resources, including human and social capital
Organizational innovations	Network approaches and innovative partnerships

Social innovation is a modern ‚buzz word', but not without reason: Social innovation is a critical type of innovation and a condensed definition of social innovation would be "new concepts and measures that are embraced by concerned groups of society and used to meet social challenges" (ZSI, 2008). Therefore the concept could be used to refer to innovations both with a specific social purpose, as well as simply new ways of organizing social activities.

2.1.2 Definition of institutional innovations

The concept of institutional innovations is, as for social innovation, not strictly defined in the literature. Woodhill (2004) argues that a) institutional innovations are at the heart of what most stakeholder processes tries to tackle, b) success of social innovations, including process design and facilitation, is dependent of understanding of the institutional context, and c) institutional constraints for effective multi-stakeholder processes is crucial to understand. This also implies that some institutional change may be necessary to bring about wider institutional innovation.

Within agricultural production systems institutional innovations can be a response to most problems of sustainability, ranging from local networks and agencies to new regimes for international trade. Clearly, the distinctions between the different kinds of innovations cannot be very sharp. As argued before, different kinds of innovation go hand-in-hand or, using the terminology of Norgaard, they co-evolve (Norgaard, 1984).

One example would be technological innovations that can change action situations by changing roles and rights of actors related to the use of technology. Local technological innovations can therefore be seen as being evolved from specific local institutional contexts or be developed elsewhere and introduced into specific local institutional contexts. Remembering that externally developed technologies are not necessarily less sustainable than technologies developed from grassroot actors themselves, especially when the potential users of the technology have been part of the innovation process in innovation systems (Nyikahadzoi et al. 2012) (Figure 2.2).

Institutions are the sets of rules which emerge from the attempt to structure social interactions. Social interactions, in turn, are shaped by institutions. There is therefore an inherent dynamic between social and institutional innovations, while institutions enable and constrain actions but are also changed by social actions. The boundaries of the action situation itself are defined by institutions, as well as membership, authority, and a variety of other rules which specify the scope of outcomes, the information available, or how costs and benefits are allocated (Ostrom 2005). Desired behavior is motivated by institutions, while undesired behavior is sanctioned. While some institutions have emerged spontaneously, without purposeful design, and have eventually become habits or traditions, others are the result of purposeful design.

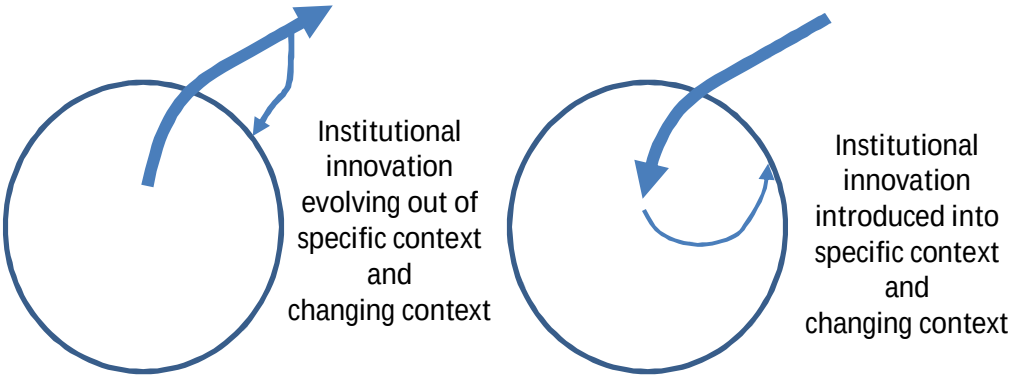


Figure 2.2. Institutional innovations evolving from local processes or introduced from outside, but which both change existing context (Gatzweiler, 2016).

In short, institutional innovations mean new responsibility sharing or role distribution arrangement among stakeholders within the agricultural/farming sector. The challenge is that in some cases there are key institutions exhibiting a total lack of such basic perspective and thus innovation. Examples would be environmental and agricultural authorities that fail to integrate policy delivery, which do not communicate constructively with each other, or do not work with an integrated approach to implementing e.g. Natura 2000 and the CAP. The result being that they leave it to farmers and other local stakeholders to sort out the inherent tensions between policies. Another example could be environmental authorities that do not collaborate with farmers, just impose regulations on them. What this tells us is that without some basic values and communicative skills in key institutions social and institutional innovation will not take place.

2.2 Particular features of the literature review methodology

A detailed procedure for the research under this theme was developed (presented in Annex 1) and followed by the project partner working on it. Since the main interest of the project are the HNV farming systems, each of the key words identified for the Social and Institutional innovation theme was combined with each of the four HNV farming systems.

Perspectives guiding the literature review
The main perspectives and terminologies guiding the search for literature in the review on Social and Institutional innovation have been collected from:

1. Institutional innovations (supporting HNV-farming and/or social innovation)
   a. Institutional modes of operation that support HNV farming (e.g. integrated decision-making, communication)
   b. Conducive policy environments (for social innovation, overlapping with regulatory framework)
   c. Institutional framework (favoring further innovation, incl processes that lead up to new schemes)
   d. New institutions and governance models evolving to manage specific societal challenges (incl outcomes of social innovations).

2. Social/institutional innovation (structural aspects)
   a. Building collaborative potential (structured processes that create better preconditions, f.i., social and relational capital, trust)
   b. Horizontal collaboration (incl different kind of farmer groups, farmer-local actor collaborations, and other kind of co-operation on a specific system level)
   c. Vertical collaboration (incl policy chain and value chains, across system levels)

3. Social/institutional innovation (categories and forms, procedural and communicative aspects, incl relational issues)
   a. Categories and forms of social and institutional innovations
   b. Process facilitation (incl new role of animators)
   c. Process design (incl the art of combining different methods over time to create change and/or impact)
   d. Building competence in communication, learning and change (incl applying modern pedagogic in new contexts, training stakeholders in communication, etc)
   e. Learning systems – feed-back loops (incl new systems for participatory learning and action)

4. Institutional innovations in scaling up/out and evaluation
   a. Approaches to scaling up and out of innovations
   b. New methods in evaluation of institutional and social innovation (incl formative approaches to continuous improvement, both for practice and policy)

2.3 Summary of main results from the literature review

- There are very few scientifically reviewed studies which directly focus on the challenges in HNV farming systems. In general social and institutional innovations are well described and analysed in the literature, but not in the specific context of HNV farming. This is not a problem while a majority of social and institutional innovations in agriculture are relevant for most contexts.

- There are some research environments and countries that seem to dominate the scientific literature. Although these developments take place all over European agriculture, it is clear that the more of the theoretical development of this field of research are done at some specific centres, especially in the field of farming and learning systems and innovation systems.

- In many of the publications, where we had a search match between "HNV farming systems" and social and institutional innovations (and linked key words), we found strong arguments and a need for such innovations in order to enable more sustainable farming systems. As a consequence a big share of the literature just mentioned social and/or institutional innovations but did not elaborate on it further. We know what is needed, but not how to do it.

- There is an overlap between the innovation themes – in the discussion of social and institutional innovation the purpose is sometimes to develop new markets, products, technologies or even to change the context (f.i. the regulatory framework). Furthermore some of the social and institutional innovations are argued to enable further social and institutional innovations (or each other – social innovations enable institutional innovations and vice versa).

- There is a strong theoretical foundation when discussing social and institutional innovations in agriculture today. Many of the social scientists in this field belong to the research community in "farming systems", where a need to transform the governance principles for agriculture has been identified in order to create a sustainable knowledge system. The approach is often characterised by a collaborative perspective on learning, change and innovation, emphasising not only a bottom-up approach but rather a multi-stakeholder approach for sustained change to take place.

- It is important to realise that the most of our understanding of social and institutional innovations are described in general terms, often presenting factors that need to be taken into account (although being grounded in empirical work). This might be seen as a problem for the development of guidelines for assessment or concrete initiatives in a specific HNV-farming context. But the argument here is that it is not.

  When it comes to social and institutional innovations most important is to have certain functions of a social system in place. Take the example of facilitators; the literature clearly argues for the need of trained facilitators to support the development and implementation of social innovations. But exactly how these facilitators will work (together with and in front of people) is an open question. A facilitator can chose the level of participation, can use different methods and tools to manage specific situations (the tool box) and are of course different when it comes to their communicative style. This result in individual variations, but where some guiding and general principles for what make facilitation successful is described. This is general conclusions, but still highly relevant for the future development of HNV-farming.

2.4 Examples of existing innovations

SUB-THEME: MULTI-ACTOR PLATFORM FOR SOCIAL LEARNING

Short description of the innovation:	Creating a multi-actor platform for dialogue, deliberation and decision-making (social learning) for sustainable development of a watershed area

Related themes/concepts/key words:	Multi-actor approach, collaborative learning, stakeholder participation

Examples of innovative use of [multi-actor platforms]:

HNV system concerned:	Potentially all HNV farming systems
What is the innovation:	Organizing platforms for actors to learn together on complex issues (and to take joint action)
Stage of development:	Not fully development

Social learning was put into practice in a multi-actor negotiation platform in the Dutch Drentsche Aa area in Holland. Social learning arises "out of interaction (engaging in issue formulation and monitoring, negotiation, conflict resolution, learning, agreement, creating and maintaining public goods, concertation of action) among multiple, inter-dependent, stakeholders" (Blackmore et al., 2007, p 500). Social learning is therefore focused on placing a set of multiple, interdependent stakeholders in an intersubjective situation in which they will collectively learn to gain insight into the causes of, and/or the means and methods. This was also the purpose of this initiative.

Who initiated and who joined/followed?

Given the resistance and opposition to a procedure declaring the area as national park by the provincial authorities in 1992, it was felt that a hierarchical declaration of a National Park would deliver few results. To avoid further escalation of the conflict, an experiment with multi-actor negotiation on a regional scale was set up in the late 1990's to discuss the installation of 'a National Park with extended objectives' under the authority of the elected provincial government.

Identified enabling conditions or success factors

The theoretical and empirical understanding of social learning.

Identified gaps and/or limiting factors

The case study show that, although the multi-stakeholder platform aimed for open dialogue and at first sight appeared to meet the conditions, social learning was not achieved and the dialogue and deliberation stagnated because of disagreement, frustration and distrust. The process was characterized from the beginning by unequal power relations, which enabled a dominant coalition to impose its problem definition and limit possible solutions. This shows the importance of avoiding putting constraints on the space for deliberation, for example, by imposing a problem definition and restricting possible solutions. This might be seen as a strategy to reduce complexity and achieve order, but does in reality creates a rich picture necessary for avoiding pseudo-solutions.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

If managed according to the principles of social and collaborative learning a multi-stakeholder platform can enable sustainable change when relevant actors and stakeholders agree on a joint way forward to manage complexity and inherent conflicts.

Sources:
Blackmore, C. et al., 2007. Social learning: an alternative policy instrument for managing in the context of Europe's water. Environmental Science and Policy 10:493–586.

van Bommel, S. et al., 2009. Social learning for solving complex problems: A promising solution or wishful thinking? A case study of multi-actor negotiation for the integrated management and sustainable use of the Drentsche Aa Area in the Netherlands. Environmental Policy and Governance, 19, 400–412.

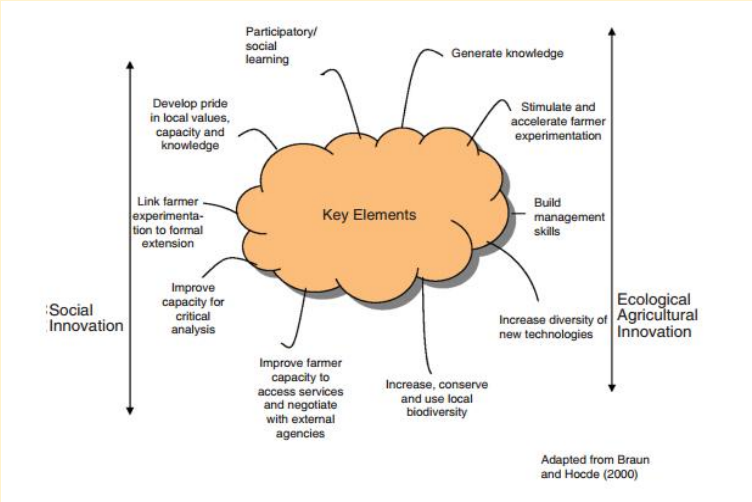
SUB-THEME: ORGANIC FARMER NETWORKS

Short description of the innovation:	Organising learning networks among farmers
Related themes/concepts/key words:	Study groups, study circles, farmer groups, communities of practice, learning communities, participatory action research

Examples of innovative use of [farmer networks]:

HNV system concerned:	Potentially all HNV farming systems
What is the innovation:	Organising, designing and facilitating farmer networks
What stage of the process is it in:	Full development

The figure describes some of the focus areas which guides the establishment of organic farmer networks and their work for a multifunctional and sustainable agriculture (Kroma, 2006):



Who initiated and who joined/followed?

In the Finger Lakes region of New York, US, a group of organic farmers had emerged whose practices and modes of interaction reflected a strong orientations towards learning and innovative management. Beyond experimenting with innovative technologies, the organic farmers had developed creative ways of sharing and learning based on so called farmer networks. The questions asked in the study were: What are the dimensions of the agro-ecological innovations/knowledge produced by network members? In what ways do such farmer-based networks approximate a learning community? What

are the relationships and implications for extension practice relating to farmer-based networks in the region?

Identified enabling conditions or success factors

One out of many examples of farmers' collaborative learning efforts was related to their fallowing strategies. These efforts clearly showed that their management decisions were not always grounded exclusively within the context of their own local knowledge; they also draw critical insights and knowledge from scientific agricultural science. Röling (1996) has argued that alternative management decisions need to be understood as a function of an interplay of scientific and local/experiential knowledge. For Somers (1998), sustainable agriculture is best served by intensive interaction between scientific knowledge and the knowledge generated by farmers in their own local contexts. This was an important factor for success in this case. But perhaps more important was the social relations developed within the network, which in itself enabled innovations. The findings showed that, when successful, the networks were both flexible and inclusive, often including a small number of researchers and extension agents; and through these social networks, innovative practices were being compared, analyzed and shared among farmers.

Identified gaps and/or limiting factors:

The main limiting factor for the farmer network to be sustained and to continuously being developed is rather on the margin of the network. Specific individuals within the extension system have been instrumental in supporting and facilitating the networks. But too few individuals, as well as an organizational culture, within the extension organizations becomes a limiting factor. This involves many dimensions: Linking extension practice to a broader, multidisciplinary knowledge base can contribute to improving extension's relevance and reach among a growing and increasingly diverse constituency of stakeholders in the agricultural and food systems. Extension could also better address the challenge of effective communication, facilitating decision making that minimizes the risks inherent in complex agricultural systems. Extension can work closely with farmers to test and validate resource-conserving agricultural technologies that fit particular farming systems while playing a major role in developing local leadership capacities among organic farmers. The study conclude that among the challenges for an engaged extension system – one that responds to the needs of this growing community of producers is – how to shift from a narrow focus on technology supply and behavior change of the individual farmer to one of facilitation of group processes of learning, supporting innovative capacity.

<u>Benefits to HNV farming</u> systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

By developing the competence among important actors involved in local/regional agricultural development, in this case the extension agents and advisory services, local farmers and their networks can be supported and facilitated so that they can make use of hidden potentials for innovation through joint learning and experimentation. To be beneficial for HNV farming systems, this approach would need to target these systems specifically.

Source:

Kroma, M., 2006. Organic farmer networks: Facilitating learning and innovation for sustainable agriculture. Journal of Sustainable Agriculture, 28:4, 5-28.

SUB-THEME: TRANSFORMING LOCAL ACTION GROUPS (LAG/LEADER) TO REGIONAL DEVELPMENT CENTRES

Short description of the innovation:	Developing externally, project funded new institutions into more sustainable institutions for regional development
Related themes/concepts/key words:	Regional innovation systems, clusters, multi-stakeholder platforms

Examples of innovative use of [transformed institutions]:

HNV system concerned:	Potentially relevant for all HNV farming systems
What is the innovation:	Being able to take advantage of an externally funded project in order to create long-term, sustainable structures for regional development
What stage of the process is it in:	In progress (South Tyrol)

Research on community-led local development (CLLD) initiatives in rural areas of Europe have emphasised its importance for rural social innovation. These social innovations, within rural development programs, are grounded in social processes and outcomes which in turn creates social value for the local community. This study is both an overview of the research in this field, as well as a case study from South Tyrol.

Who initiated and who joined/followed?

A bottom-up culture in rural development programs (LEADER) has been shaped through the Tyrollean LAGs (Local Action Groups), which have developed local programming, and an environment of discussion among the different sectors. LEADER has also brought creativeness; the origins of initiatives such as the Christmas markets, "yoghurt week" and the canederli [typical South Tyrolean dish] festival, each emerged directly or indirectly from the LEADER initiative. LEADER has helped to improve the economic, social and cultural fabric for all citizens of these district communities.

Identified enabling conditions or success factors

In this case and during the LEADER period 2007–2013, the LAGs have been transformed into centres of regional development. This means that the LAGs do not deal only with LEADER funding, but also with INTERREG, the European Social Fund and other Community funding. In sum, the LAGs have become pivotal in stimulating rural development planning beyond the remit of LEADER. As agents of innovation themselves, LAGs have thus been able to learn, become empowered and build social capital through their networks. As a result of this, LAGs have been able to evolve and develop distinctive approaches to suit their localities. This have been possible due to a basic and relative long term funding, successful work with coordinators and animators, as well as a broad and engaged network of stakeholders.

Identified gaps and/or limiting factors

A lack of experience of collaboration was identified as a limiting factor in South Tyrol, as in many regions of Europe, but on the other hand one also identified that institutional innovation increased engagement among rural agents, in particular among municipalities, associations, and between municipalities and associations (e.g. the increasing cooperation between agriculture and tourism). The permeating and dominating tradition of top-down politics, and a rigid administrative system, hindered in the beginning alternative ways of working, especially the important delegation of responsibility to the various local communities.

Benefits to HNV farming systems, farmers and communities:

Creating institutional structures, avoiding a short-term project culture, is important for sustaining local and regional initiatives dependent on external funding and high competence. The institutional innovation described in this case is thus an example of what might be possible in HNV-farming areas in general, where HNV farming systems could be targeted.

Source:

Bosworth, G., Rizzo, F., Marquardt, D., Strijker, D., Haartsen, T., and Aagaard Thuesen, A.. 2016. Identifying social innovations in European local rural development initiatives. Innovation: The European Journal of Social Science Research, 29:4, 442-461.

SUB-THEME: FROM EXPERT TO FACILITATOR – THE CHANGING ROLE OF CIVIL SERVANTS

Short description of the innovation:	Development of organisational role and individual competence when trying to manage complex and controversial natural resource issues (oak management in cultural landscape, East Sweden)
Related themes/concepts/key words:	Process designer, animator, catalyst, coach

Examples of innovative use of [professional facilitators in public authorities]:

HNV system concerned:	HNV mixed and mosaic systems
What is the innovation:	Identifying and implementing a completely new role and competence in relation to external processes in order to manage a contested habitat in modern agricultural systems
What stage of the process is it in:	Fully developed

Existing oak woodlands and oak environments are of international standard in terms of natural and cultural values. The County Administrative Board has developed a regional landscape strategy called "Live Oak Woodland Östergötland 2008-2015" in order to secure future management of these oak environments. This work partly begun before the government commission to develop regional landscape strategies in 2006. Initially focus was on getting different units of the County Administration, the Swedish Forest Agency and municipalities to learn each other's instruments and increase their knowledge. An integrated approach was asked for combing competences in agricultural economics, forestry, natural and cultural heritage, etc. Key institutions realised early that successful internal collaboration was necessary for successful external collaboration. Evaluations shows that increased communication and collaboration between departments within authorities, both at local and regional level, as well as between authorities, has been a critical success factor.

Who initiated and who joined/followed?

The origin was a LIFE-project funded by the EU. The County Administration continued the work, but changed the approach in order to be able to reach the goals.

Identified enabling conditions or success factors

A conscious strive to work for increased responsibility sharing and changed role distribution arrangement among stakeholders. Communicative skills och and process facilitation was important, as well as giving enough time for developing a procedural consensus among key actors.

Identified gaps and/or limiting factors

Lack of resources and a negative perception of the County Administration among many land-owners and active farmers had to be overcome.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Shepherding, which is central to HNV livestock systems, has declined drastically over the last decades. This initiative raises the awareness of people on the need to preserve the biodiversity related to shepherding and the shepherds themselves.

Source:

Ljung, M. and Nordström Källström, H. 2013. Miljöåtgärder i samverkan – strategier för att inspirera till miljöåtagande [Collaborative environmental measures: Strategies motivating environmental committment]. Report 2013:31. Jönköping: Board of Agriculture. [In Swedish]

SUB-THEME: LANDSCAPE OBSERVATORIES (EUROPEAN LANDSCAPE CONVENTION)

Short description of the innovation:	One of the key instruments of the implementation of the ELC are landscape observatories. The number of landscape observatories has increased over the years. The southern European countries have had landscape observatories since years back on both local, regional and national level. Most of these landscape observatories are functioning as a focal point for landscape education. [Catalanya]
Related themes/concepts/key words:	Learning networks, social learning platforms, communities of practice

Examples of innovative use of [landscape observatories]:

HNV system concerned:	Almost all HNV farming systems
What is the innovation:	Establishing a new institution which facilitates and support the implementation of a landscape perspective and a landscape approach to spatial/physical planning in society
Stage of development:	In parts of Europe full development, while in other parts in progress

The Catalan Parliament joined the European Landscape Convention (ELC) in December 2000. The first and most visible result of the Landscape Act was the creation of the Landscape Observatory of Catalonia (www.catpaisatge.net), which has been operative since 2005. The Landscape Observatory has been conceived as an advisory body to the Government of Catalonia and for awakening society to matters of landscape. The Observatory has become a meeting place between the administration

(at all levels), universities, professional groups and the whole of society regarding everything related to landscape. The main functions are collaborating with the Catalan administration for the implementation of the ELC; making Catalan society aware of the importance of landscape and the right to enjoy it; and acting as a centre for research, documentation, thought and action on landscape.

One good example developed is Wikipedra. Wikipedra (http://wikipedra.catpaisatge.net/) is an interactive 2.0 version of a Geographical Information System to introduce, visualise and consult data regarding dry stone huts and shelters in Catalonia. This online application enable, on the one hand, carrying out intuitive and interesting consultations (with maps, photos, files and searches) and, on the other, it will alow people to introduce and modify data regarding dry-stone constructions in Catalonia. It is therefore an example of public science. The objective is to gather and update data regarding as many as possible dry-stone constructions. In the first six months of existence, Wikipedra made an inventory of more than 5.000 dry stone huts and shelters all over Catalonia, mainly by the public. In this project the Observatory is merely an umbrella organisation for promoting and developing the Wikipedra database. The information comes in from members of the public and associations, for use in landscape policies.

Who initiated and who joined/followed?

In Catalonia the establishment of a Landscape Observatory came from the regional Government. It became a platform for competence development and participation in issues related to landscapes. A Governing Board, consisting of app thirty public and private institutions, participate in discussions regarding priorities and projects.

Identified enabling conditions or success factors

The Observatory's structure and organisation are important for fostering a spirit of co-operation and participation. Three aspects can be mentioned in this respect. Firstly, the Landscape Observatory is a public consortium, with its own legal personality. This gives the Observatory an open-ended character, and makes it very flexible in its functions and its activities. Secondly, the composition of the Observatory, which is made up of over thirty public and private institutions gathered in the Governing Board (www.catpaisatge.net/eng/observatori_ organigrama.php). The Observatory also has an Advisory Council made up of several economic, business and social groups, as well as academics involved in the subject. This composition allows for a dynamic dialogue between members of the Governing and Advisory Councils, with voices coming in from different places and often with opposing interests. Finally, the Observatory lies halfway between civil society and the administration. This is interesting insofar as it can advise the administration on drawing up landscape policies for the territory, while at the same time communicating concerns felt by society

Identified gaps and/or limiting factors

One of the main challenges of the ELC is the integration of landscape into policies. This challenge probably requires the greatest amount of co-ordination among the different sectors involved. Another challenge is related to public education and awareness-raising which is costly and time-consuming if to have any real impact. Here is a need for methodological development.

<u>Benefits to HNV farming</u> systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Landscape Observatories have different structure, purpose and working methods in different regions of Europe. What is in common is the overall aim of the European Landscape Convention, focusing on knowledge and participation. During last 10 years many institutional, and social,

innovations have been developed within the context of Landscape Observatories. This is something HNV farming might learn from.

Source:
Ellorieta, B and Sanchés-Aguilera, D. 2011. Landscape regulation in regional territorial planning: A view from Spain. In Jones, M and Stenseke, M. (Eds.) The European Landscape Convention: Challenges of Participation. Springer, pp 99-120.

Sala, P. 2012. Regional and local participation and co-operation in implementing the European Landscape Convention – the experience of the landscape observatory of Catalonia. In Raasakka, N and Sivonen, S. (Eds.) Northern Landscapes: Implementation of the European Landscape Convention in the North Calotte Area Municipalities. Conference Proceedings from Inari, Finland 7-9th of September 2011. Report 48. Centre for Economic Development, Transport and the Environment for Lapland, Finland.

2.5 Key findings from the innovation examples

2.5.1 Role of social and institutional innovations

When reading the following texts it must be clear that most of the findings regarding social and institutional innovations (incl conclusions and recommendations) are *not* country- or context-specific. Of course, how for instance a network of HNV-farmers is constituted and how they chose to work in more detail will always be a consequence of context and culture, but the phenomenon as such is not. We have farmer networks all over Europe, and there are some general factors which enable or hinder success. In this part of literature review we have chosen to work on this universal level.

Many of the challenges that HNV farming systems are facing are only possible to manage through social and institutional innovation. Such innovations are often required at different policy or decisions levels simultaneously - from interdepartmental agency cooperation to local cooperation between private landowners (horizontal collaboration), but also between the systems levels in existing governance structure - for example, between regional authorities and individual landowners (vertical collaboration). On all levels there is a potential or even a need for social and institutional innovation (eg., Conley and Moote, 2001; Franks and McGloin, 2007). It is about changing the governance structure to support HNV farming systems in new ways.

At the very core of social and institutional innovation lies the somewhat problematic divide between expert and lay knowledge (eg., Fischer, 2000; Bohman, 2000). Daniels and Walker (2001) describe this as a fundamental dilemma in all participatory decision making – using best available knowledge as well as creating opportunities for the public to have a say and real influence of the outcome. The management response being a need to find ways to work across traditional systems boundaries and to create new social institutions (Berkes and Folke, 1998; Habron, 2000; Murray et al, 2010). In the more general academic literature on natural resource management and sustainable land use it is becoming increasingly recognized that learning for systemic governance transformation is often lacking but needed (Meppem and Gill, 1998; Leeuwis, 2002; Pelling and High, 2005; Wals, 2007; Ison et al, 2007; Hounkonnou et al, 2012). As part of this endeavor arguments have been made that we need a better understanding of the relation between 'social capital', and 'scale, space and place' when enabling collective action based on collaborative processes aiming for social and institutional innovation (eg., Meppem, 2000; Gibson, 2001). No doubt, today there is an immense source of theoretical frameworks to build from when designing, facilitating and evaluating social and

institutional innovations in natural resource management. But very few of them focus specifically on HNV farming systems and almost none has strong empirical foundation were the long-term success of social and institutional innovations in a HNV context is described. Little empirical evidence is still at hand on how policy makers, practitioners and researchers successfully can learn and act together to manage complexity and conflicts (Tschakert and Dietrich, 2010; Ison et al, 2011; Powell et al, 2014), why there is a need for both further experimentation and scientific studies.

Social and institutional innovation in HNV farming systems is in each case a unique process of cooperation and joint learning. Challenges, issues and pre-conditions will differ from case to case. But there are a number of guiding principles helping stakeholder to design and manage their unique processes. The literature review has revealed a number of common features of social and institutional innovations. These can be seen as success factors. We have chosen to structure them under four headings:

1. External pre-conditions to enable social and institutional innovation

2. Social and institutional innovations to create better pre-conditions for other types of innovation (i.e., farming techniques, management, products and markets)

3. The organizational forms of social and institutional innovation and the nature of the activities in social and institutional innovation processes

4. Capacity building, new relationships and changes in communication through social and institutional innovation (creating a positive development spiral)

Several of the scientifically described social and institutional innovations can illustrate the common features (eg., Uphoff, 2001; Muessner, 2005b; Walker and Senecah, 2006; Murray et al, 2010; Sonnino, 2010; Klerkx et al, 2010; Otsuki, 2011; Darnhofer et al, 2012; Ljung and Nordström Källström, 2013; Ernesto Mendez et al, 2013; de Sainte Marie, 2014; Sutherland et al, 2014; Höll, 2014; Ferraz-de-Oliveira et al, 2016). The references given above should be seen as illustrative examples. It is also important to remember that in social processes, such as multi-stakeholder approaches and other institutional innovations, success is depending on its weakest link. That is why many different aspects must be met in order to create long-term sustainability.

2.5.2. External pre-conditions to enable social and institutional innovation

To achieve a sustainable development of HNV farming systems social and institutional innovations are not enough, they are dependent on other means to be able to contribute with their full potential. It is about - as in other contexts - to create a suitable mix of incentives and regulatory frameworks, such as advisory services, educational programs, economic incentives, market support, etc (eg., Rollett et al, 2008; Wynn et al, 2001; van Woerkum, 2000). In the same line talk Muessner (2005a) about “integrative strategies” which reflect a political will to integrate many different concerns in sectorial policies, like agriculture and forestry. This is in line with an understanding of conservation (Hulme and Murphree, 1999) characterized by, among other dimensions, a move away from state centric to community level focus, and an incorporation of neo-liberal ideas, and market forces "to make conservation pay" (Brown 2003). In this perspective integration of environmental matters is only one facet amongst others in a much broader process. From a policy perspective it is therefore today important to support social and institutional innovation by creating enabling pre-conditions for new initiatives.

The regional (or national) government often take the formal role of coordinating the efforts of different actors and push them to work inter-sectorial (eg. Ljung and Nordström Källström, 2013; Bohnet and Konold, 2015). If not, there is a risk that the common challenges fall "between the chairs". Everyone's responsibility often ends up being nobody's responsibility. To enable social and institutional innovation it is beneficial if there already exist a consensus among key actors on common challenges, a shared vision, and a belief and trust in that social interaction and institutional change is important and a possible way forward (eg., Ljung, 2001). If each stakeholder acts according to its mandate, but still towards a common vision each effort work will be more clearly integrated and an overall effect more pronounced (eg., Daniels and Walker, 2001). The result being a form of multi-level governance (eg., the French case described in Farmpath, 2014; Süß et al, 2011).

A common experience made is that the local/regional capacity for social and institutional innovation is important (eg., Farmpath, 2014; Bohnet and Konold, 2015). If there is a local/regional mandate and capacity to coordinate between different stakeholders (farmer organizations, rural entrepreneurs, nature conservationists, industry, authorities, etc) it will facilitates such a collaboration that makes social and institutional innovation possible (a good example is the PLENUM-approach in Germany, as described by Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg, 2011). Such enabling and/or bridging institutions are simply perceived as professional and credible (eg., Hahn et al, 2006). Furthermore, a long-term commitment and a continuity of support from initiating actors are of central importance (eg., Roth et al, 2008). The temporal scale of supportive policy measures should not be underestimated (eg., Rollett et al, 2008). Most social and institutional innovation takes time - it is about social relationships and to build trust, which cannot be done in quickly. That is why it is important to establish supportive structures that enable those who want to work together. Such support may involve providing administrative support in the form of simplifications and shortcuts into the administrative system and/or giving more possibilities for self-regulation (eg., Schrijver and Uetake, 2015; Termeer et al, 2013). Another dimension of the supporting structures is of course financing. For authorities, it is sometimes about having the courage to prioritize, to target resources where they are most useful but where one might perceive to lose administrative control (eg., van Bommel et al, 2012). Another aspect is to help coordinate of landowners, owners and other players, that is, to take responsibility for process design (eg., Ljung and Nordström Källström, 2013). If managed successfully the above mentioned examples of external support also have the positive effect of better compliance among farmers, because they perceive the interventions as appropriate, fair, equitable, effective, proportionate, relevant and even necessary (eg., Winter and May, 2001).

Who is given the opportunity to participate in a joint multi-stakeholder process is obviously of importance. An important starting point is that there are those who have the power to implement change that should be included, what often is referred to as actors. It could be land owners, funders, or it may be policy- and decision-makers - all having a mandate in various forms. In HNV farming systems, it is primarily those who can implement concrete measures on the ground, particularly land- and livestock owners (eg., Ljung and Nordström Källström, 2013). Involving relevant stakeholders at the right time (timing) is a success factor in social and institutional innovation in natural resource management in general (eg., Cox, 2006).

2.5.3 Social and institutional innovations to create better pre-conditions for other types of innovation

Social and institutional innovations can take many forms. Within HNV farming system one example would be new governance structures for adaptive management (Chapin et al. 2009), which has been

described as a core component of resilient HNV farmland management (Plieninger and Bieling, 2013). Adaptive management is dependent on the daily involvement of people living in and using the ecosystems (eg., Rescia et al, 2010). Kenward et al (2011) shows that biodiversity and ecosystem services are most effectively safeguarded when starting from the perspectives of the local ecosystem stewards, which are individuals or groups that exert influence on ecosystems and their goods and services at the local scale (Chapin et al. 2009). This is not necessarily only farmers, but also other stakeholders monitoring, stewarding or supporting the HNV farming system (eg., Schultz et al, 2007). Social and institutional innovations in HNV farming is often connected to such cross-scale coordination of ecosystem stewardship, where land-owners and other stakeholders work together to manage landscapes (eg., Olsson et al. 2007). So called bridging organizations, for instance land care groups or rural NGO's, could be essential for providing leadership and vision, supporting knowledge networks, and maintaining the link between culture and management at landscape scales (eg., Hahn et al, 2006; Olsson et al, 2007; Crona and Parker, 2012; Mikulcak, 2013). These are all examples of social and institutional innovation within the HNV farming systems.

From an organizational point of view we might talk about different levels of formalization – from lose networks to formalized public-private partnerships or even new companies. Much of the literature on social and institutional innovations focus on the organizational forms, but what is important to keep in mind is that the organizational forms often is a means to reach specific goals. It could be to develop and implement new technologies, new products or markets. In this sense social and institutional innovations aim to create better pre-conditions for other types of innovation to be developed.

In its simplest form an institutional innovation can be a new platform or venue for collaboration/joint learning, initiated by any actor and from which a new network is built (eg., Muessner and Suosa-Pinto, 2005; Kroma, 2006). On another level we can talk about thematic groups, such as farmer study groups (eg., Paine et al, 1998; Bager and Proost, 1997) or study circles (eg., Ljung et al, 2000). The degree of formalization of social interaction is, when compared to open networks, slowly increasing. Regarding more formalised co-operation between actors, it could be through formal agreements that regulate interaction or even partnerships (eg., Ljung and Nordström Källström, 2013). Also, financial associations might emerge or new companies (eg., Gehrlein et al, 2013; Murray et al, 2010). In these latter forms the interdependence between the participating actors is very strong.

The geographic scale that you choose to work on is of importance (eg., Woodhill, 2012; Wyborn and Bixler, 2013). On the one hand, it seems to be important not to have too large scale in order for the participants to feel connected and to have something in common (also linked to identification, trust and confidence). On the other hand, it should not be too limited in scale either, because the interaction and especially the learning dimension benefit from a sufficient breadth of perspectives, different experiences and a broad resource base for the practical work (eg., Jellinek, 2006).

Social and institutional innovations are very much about organizing your work, perhaps more than the organization itself (eg., Bohnet and Konold, 2015). Part of organizing is to have a conscious process design which creates good conditions for successful work (Daniels & Walker, 2001). The design process starts with getting a good understanding of what is supposed to be achieved and the collaborative potential in a given context (eg., Ljung, 2001). Having the overall aim and an understanding of the pre-conditions it is possible to chose or design an approach and overall methodology (strategy) which leads the participants to their shared goals. When implementing activities and selected tools, the support of a professional process facilitator is often required (at least in domain critical activities). Process design is about a number of guiding principles and central questions to help stakeholders to make conscious and strategic choices at an early stage of the process (eg., Ljung, 2001).

An important piece of the puzzle is often to be innovative in creating new arenas for high-quality meetings and collaboration resulting in new innovations (eg., Conley and Moote, 2000). Many traditional meetings are often too traditional in both its form and content, which does not create either the security (safe place) or the creativity (open space) that usually are the very core of social and institutional innovations. If not, it will be hard to manage the complexity and sometimes controversial issues characterizing changes in natural resource management, including HNV farming systems (eg., Daniels and Walker, 2001). As with creating external pre-conditions for social and institutional innovations one must be able to create internal conditions that meet the basic requirements for stability, longevity and continuity.

Trying to implement social and institutional innovations (scaling up and out; see for instance Wigboldus and Leeuwis, 2013), means entering a situation where stakeholders already their schedules and days full of obligations and activities. This result in that new initiative easily is forgotten or not prioritized. Social and institutional innovations are, as mentioned earlier, a shared responsibility and therefore easily becomes nobody's responsibility. Furthermore, there is a tendency to shift responsibility where the actor taking the initiative, the coordinator or the process facilitator need to take a disproportionate responsibility for implementing measures (especially in the beginning of the process). Such tendencies have been shown to be important to counteract (Ljung, 2001; Ljung and Nordström Källström, 2013). When the internal conditions for collaboration are formulated, it is therefore important to take into account both the long-term nature of the process, but at the same time designing the work so that there is a sufficient intensity at work (at least in the critical phases). Otherwise stakeholders' engagement might be hard to maintain.

In the literature the link between farm/business economics and socio-ecological sustainability has clearly been put forward (eg., Pinto-Correia and Kristensen, 2013). As an example, conservation of certain ecological values can only be achieved through active and traditional cultivation (eg., Horcea-Milcu, 2015). This is to say a holistic development perspective of rural areas (eg., Ribeiro et al, 2014), where entrepreneurship and the local economy is in focus (eg., Klegg and Akrigg, 2014). Of course, this have to be combined educating people about the individual's response to the desired and shared state to be created (eg., "landscape visions" as described by Muessner, 2005b). In many social and institutional innovations in HNV farming the abovementioned inter- and trans-disciplinary approaches are an integrated part.

2.5.4 The organizational forms of social and institutional innovation and the nature of the activities in social and institutional innovation processes

The core of social and institutional innovations is a creative involvement and participation of relevant stakeholders. One key element is the need to put the local or traditional knowledge to the fore, which has shown to be instrumental for sustainable land use of HNV farming systems (eg., Gomez-Baggethun et al, 2012). However, how such participatory processes are enabled looks different and there is often an element of methodological experimentation (eg., Luz, 2000; Murray et al, 2010). Even the perception of the target audience may vary. The stakeholder analysis can reveal that specific groups needs to be involved, such as young people (eg., Farmpath, 2014), or in other contexts that as many as possible of the local ecosystem stewards should be invited (eg., Schultz et al, 2007).

Social and institutional innovation means doing things in a new way to manage existing or new challenges. Murray et al (2010) present an ambitious overview of the categories and many organizational forms that social and institutional innovations can take. They structure the complex

map under headings which relate to the innovation process, from the phase of generating ideas and proposals to sustaining emerging institutions. They look at the main focus or aim of initiatives taken; participation, facilitation or new institutions, and secondly they discuss different organization forms, ranging from lose networks to the development of new associations, and what is needed to scale up and out, sustainable finance and how to support initiatives by new competence. (Murray et al, 2010). In Table 2.2 some examples of these organizational forms of social and institutional innovations are given.

Table 2.2. Examples of social and institutional innovations at different phases of the innovation process (adapted from Murray et al, 2010). In addition some 'innovations' that we already see within the farming system.

Organizational form	Short description
To enable participation in an early phase	
Platforms and venues to engage citizens	Could be both physical and virtual, and is both about letting people have a say and to mobilize them
Wiki-approaches	Similar to Delphi-approaches but with the public, one example being Wikipedra in Catalonia (Sala, 2012)
Participatory planning methods	Within physical planning a lot of new methods have been developed to involve and learn from stakeholders
Citizen juries and panels	Often a larger group of randomly sampled people that are asked to give opinions on ideas and policies
Multi-stakeholder platforms	Establishing new arenas where different stakeholders can meet to learn more about issues and find common solutions
To facilitate participation	
Events for networking and learning	Creating new forum for sharing and spreading information, like workshops and speed-dating, etc.
New forms of virtual meetings	New methods in which individuals have a virtual version of themselves (an avatar) and engage in dialogues over long distances, but also examples of 'serious games'
Webinars	More traditional methods of organizing seminars over the web, but enabling participation without travelling
Dialogue cafés, open space, future search, round tables, etc.	There is today a great number of more or less pre-designed formats which facilitate participation and learning, many of which are copyrighted
New seating arrangements on traditional workshops	One should realize that just by changing the physical form for interaction another kind of dialogue and learning happens, like small-groups, bee-hives, etc.
Establishing new institutions to enable new learning processes	
Think tanks	Can have a role in generating new ideas, often focusing on policy innovation and being a catalyst
Design Labs	Putting people together to test how design can be used to tackle complex challenges in society

Challenge Labs	Putting different competences together giving them the challenge to find new solutions to systemic problems in society
Landscape Observatories	Enabling stakeholders to get involved in questions which is inter-sectorial and inter-disciplinary by focusing on all aspects of a specific landscape
Prototyping and pilots	Supporting stakeholders and given them the time and space to test new ideas in a safe environment
Incubators	When new ideas have been developed into potential business models it will need professional support and a safe environment to become an innovation on the market
Ownership and organizational forms	
Private companies	For some social innovations and ventures the private company is the most suitable model, with a social entrepreneurship focus
Limited liability partnerships	A form of legal ownership that gives the benefits of limited liability, but allows the members a flexibility to organize their internal structure as a partnership
Co-ops and associations	Clubs, NGO's, co-operatives, etc, all have an associative form, and usually build on a community of practice, could be both consumer or farmer driven
Partnerships	A formally agreed will to co-operate when it might be impossible to form a legally binding agreement, one example being public-private partnerships
Charities	A legal form that puts the organization's mission first in order to provide public benefits
Intermediaries, bounding or bridging organizations	New organizations emerging in the interface between existing institutions to manage knowledge gaps or implementation problems, etc.
Social enterprise mutuals	Providers of joint service for their members
Consumer co-ops	Organize themselves to give the members access to the products or services they ask for
Innovative ways to grow as a social innovation	
Growth through collaboration	Collaboration can increase capacity, reduce risk, facilitate adoption or manage complexity and by that make initiatives grow
Distributed organizations	Lining many small nodes enable diffusion of innovations more effectively, while keeping the advantages of being small, local and flexible
The consortium model	SME's can create a consortia to provide collective services where scale is important, often related to marketing or market intelligence
Federations	Dependent on enthusiast and given them the autonomy to lead a federation of members, especially in an early development phase

Social franchising	Enable distribution of risk and financing, but can only work if operations follow enforceable rules to ensure quality and continuity
Championing and supporting innovations	
Innovation scouts	Responsible for discovering (potential) innovations which can be adapted, adopted or replicated
Innovation champions	Individuals (often consultants) who produce ideas, networks and build new coalitions, by embedding processes in existing institutional infrastructure
Social intrapreneurs	People who work inside larger organizations to develop and promote practical solutions to social, technical or environmental challenges (often an insider-outsider approach, eg., boundary worker)
In-house innovation teams	Created within larger organizations (private or public) to bring together different competences under one roof to promote user-centred innovation (like Challenge Labs)
Local innovation teams	Usually linking local authorities with other local stakeholders, to find solutions on pressing issues
Specialist innovation units	Putting an interdisciplinary team of experts to find solutions on societal challenges
Innovation hubs and parks	Specific work spaces (physical) designed to promote collaboration and innovation (one contemporary example is science parks connected to universities)
Innovation networks and platforms	Networks can serve as alternative to formal organizational structures, they are flexible, can expand rapidly, information can be spread quickly, and they give 'pathways' from one individual to another. As a platform they also give participants the tools and resources they need to organize themselves more sustainable.
Learning communities and learning systems in agriculture	
Farmer Networks	Networking help farmers identify mutually beneficial partnerships, to collaborate with other businesses, and to engage in technology transfer and knowledge sharing (eg., Huggins and Hindle, 2010)
Farmer Study Groups/Clubs	Groups enhancing collective learning, by providing space for members to follow their own rhythm and dynamics in learning (Guijt and Proost, 2002)
Farmer Study Circles	A form of non-formal adult education, and is a way to develop competence within a certain field, but also to meet other people and be social discussing issues of common interest (Ljung, 2001)
Benchmarking Groups	In order to help farmer's learn "best practice" from each other groups focusing on benchmarking can be established, connecting farmers having similar pre-conditions and challenges (not always place-based)

Networking of Pilot Farms and Knowledge Transfer Centres	Linking pilot farmers and existing KTC's across regions or borders, providing a forum to generate an inventory of tools, techniques, and transferable expertise within a specific field of interest (see EuroDairy, 2016)
Farmer Business Co-operations	Examples of farm business co-operation are machinery sharing, contracting operations, splitting of harvesting operations (hay or silage harvesting), lending out of breeding sires and straw for manure swops. Less frequent is marketing arrangements (Wilson et al, 2014)
Agricultural Marketing Co-operatives	Co-operatives display a wide variation in structure, management and goals, but have a dual purpose, i.e. to deal with competitive markets and to satisfy the needs of its members (Soboh et al, 2009)
New Generation Co-operatives	New Generation co-operatives in agriculture focus on valueadded characteristics and processing rather than raw commodities (Downing et al, 2005)
Community Supported Agriculture	A CSA can refer to a particular network, or association of individuals, who support one or more local farms, by making producers and consumers to share the risks and benefits of food production
Farmer-Consumer Associations	Increased interest in food makes consumers look for more direct ways to access high quality food, passing existing intermediaries within the distribution system, and creating associative agreements with farmers (CSA is one form of these associations, but more exists)
Participatory Research Groups	Research and development projects which could involve both farmers, advisors, industry and researchers
Operational Groups (EIP-Agri)	A new inter- and trans-disciplinary form of collaboration for innovation supported by CAP

Enabling a social or collaborative learning process lays the foundation for innovation (Klerkx et al, 2010).This is why, by focusing on learning and participation, other benefits emerge such as new solutions to old problems (sometimes called the "progress triangle", Daniels & Walker, 2001). Through approaches such as civic science these phenomena further reinforced (eg., Walker and Daniels, 2004). By applying new decision support tools, complex relationships and systems features can more easily be understood and provide the basis for learning conversations (eg., visualization technologies, Klerkx et al, 2012; Ljung, 2001). There are also many examples where local knowledge consciously have been put to the fore, resulting in local capacity building and which in the next step have made it possible to attract external resources (eg., Ljung and Nordström Källström, 2013) or that this local capacity managed to attract targeted external investments that support the future, local work.

A common feature of many social and institutional innovations is the strategy to "pick the low-hanging fruit first", that is, to start working with those who are interested and where there is a commitment from the start and to identify win- win-situations. Identifying where you see immediate effects (eg., Lundgren, 1999) might create a positive development spiral. Such quick and positive developments can be both internally and externally reinforced by consciously telling success stories, also in the media (eg., story-telling of the benefits of social and institutional innovations).

Another trait of successful activities in social and institutional innovations is that they start from the real-life situation of landowners / users / managers. Taking practical challenges serious, and addressing the daily challenges as well as long-term sustainability issues. The bottom line of HNV farming systems is making a living, running a viable farming business. The ambitions to support land-owners to manage whole landscapes (for instance by co-operative rewards, as suggested by Goldman et al, 2007), must be combined with a focus on the development needs of single farms/farm families (eg., Bryden, 2002). It is about consciously valuing each individual's needs ("the realities of farming"), but within a framework of a common objective (eg., Dilworth et al, 2000). In addition, there is often a need to create a richer picture of the current situation in order to create a basis for further talks and additional innovations (eg.,Knickel and Kok, 2003; Albert et al, 2012; Plieninger et al, 2013). With rich pictures we can provide a thicker description that capture the actors' collective knowledge of, for example, a specific place or a given situation (eg., Checkland, 2000; Mitchley et al, 2006; Bügli et al, 2016).

As a consequence of the above mentioned changes, people in public authorities and advisory services experience that their role is changing (eg., Leeuwis and van den Ban, 2004). It's about being a mediator (eg., Wondolleck and Yaffee, 2000), catalysator (eg., Bohnet and Konold, 2015), process manager (eg., Daniels and Walker, 2001), coach or coordinator, not only an expert. The demand for increased flexibility in our approaches and focus on life-long learning means that there is a need for organizations to build a new, in-house expertise on facilitation skills (Ljung, 2001). Furthermore, the organizers of innovation networks should support individuals to perform multiple roles within an innovation network (eg., Hermans et al, 2013). The need for expert knowledge does not diminish, but it is integrated into the learning and development process in new ways, for example, making the mediation of specific subject knowledge more demand-driven (see also Molnár et al, 2016, for the description of "conservation herders" as a new profession, or similarly by Leeuwis, 2000, as "social agronomists"). These changes take place when learning become more self-directed, as it is in a participatory context (eg., Ljung, 2001). The facilitator helps the participants identify when specific expertise is important to ask for.

What becomes important for those who lead the work in social and institutional innovations are that they a) demonstrates the progress and provides feedback to the participants, b) act to keep participants motivated, c) attach great importance on agreements on procedural matters, d) clarify the scope of the work and thereby avoid the feeling of insecurity despite large degrees of freedom, e) see the participants themselves as the most important knowledge resource, and f) constantly tries to optimize the learning outcomes in a participatory process.

2.5.5. Capacity building, new relationships and changes in communication through social and institutional innovation

"It takes two to tango" is a saying that fits well when working with social and institutional innovations. One cannot interact on one's own; there must be an interest and honest intentions of other actors. There is always a risk that initiatives that are taken to involve stakeholders end up being a reflection of pseudo-democracy.

The social and institutional innovations that we have identified in this literature review are all more or less successful. Very little is written about "failed results", but this is part of the story while innovations per se are when something becomes successful. Nevertheless, guiding principles of increased awareness and enhanced participation must be translated into concrete activities. This is done when the focus moves from quick results and towards deepen relations and renewed working approaches.

Stronger relationships allow constructive learning and communication, which in turn strengthens the knowledge of each other and trust between the participants. Trust in each other is increasing (thereby reducing the risk of conflicts). In such a situation, the participants are equally willing to share the risks of taking action, as much as their willingness to share the benefits of collaboration (eg.,Ljung and Nordström Källström, 2013).

2.5.6 Concluding reflections on innovative collaboration ventures

In Figure 2.1, we summarized the most important lessons regarding social and institutional innovations from an empirical study in Sweden (Ljung and Nordström Källström, 2013). The result of the literature review supports most of these findings. Lessons learned might be understood as success factors in the HNV farming context. A central theme concerns the initiative and the establishment of new platforms for interaction. Someone has to take the initiative and has thus has an important role to play even before the innovation happened. Facilitation skills are needed from the very beginning of the process.

Another central theme is about the external and supportive structures which have to be in place already at the start and throughout the process. Social and institutional innovations are dependent on process management, of a conscious process design and suitable forms of organization. In addition, it is important to consider the choice of scale (usually geographic scale), the core values of work, how local knowledge is taken advantage of, roles and responsibilities of the partners, the ability to experiment in terms of form and content, etc. What keep interaction continues over time is, however, the level of participation and the quality of communication as well as the actual learning that takes place. The result will then not only have positive effects on the socio-ecological environment and economy (impact) but also deepen relationships and change communicative patterns among stakeholders, as well as the establishment of new working methods.

Process facilitation turns out to be a key success factor in social and institutional innovations. Facilitation is about supporting others to communicate, interact, learn and act together. A definition of facilitation which we might be used in HNV farming systems is "to enable people to express their power to act in situations characterized by complexity and uncertainty" (Hallgren and Ljung, 2005). A process facilitator thus has the task of creating conditions that enable participants to make progress, despite the uncertainties about the consequences of their actions (what Flood, 1999, calls "managing the unmanageable"). This distinguishes the role of a facilitator from that of a traditional project manager whose primary task is to ensure that the joint work is within the pre-specified limits, for example in the form of objectives, budget and time. However, there is always an element of process facilitation to project management, as well as elements of project management for facilitators. However, what is important to remember is that the roles are different in terms of focus and accountability. A facilitator focuses on relationships, interaction, pedagogy, methodology, etc., and have above all the overall responsibility for process design and that the participants are heard, respected and have real influence.

The literature review of social and institutional innovations shows that they can be correlated to an increased propensity to take action or to translate good ideas into action. First, it reduces social uncertainty, meaning that each member of the liaison group will feel safer on what to do in relation to others in the group (eg., Vella, 1994). Secondly, it strengthens the social norms among involved actors, that is, it becomes clearer what others think you should do, something that can be developed into personal norms on what is right or wrong (resulting in less societal costs for formal control, regulations, etc., eg., Gillberg, 1999). Such moral standards are not seldom activated by a perceived need for

change or a desire for justice (eg., Ljung and Nordström Källström, 2013). Third, trust and confidence ideally increase, both between participants in the group and between involved people and society at large / formal actors in the policy system (eg., Polman, 2002). It enhances your own efforts work if you can visualize how others know and appreciate what is happening, creating a self-reinforcing process.

The amount of specific case studies related to social and institutional innovations in HNV farming system is limited. Remaining challenges are related to, among other things scale and spillover effects. We have analyzed several successful social learning processes in other contexts, highly relevant for HNV farming systems, but it is not yet clear how these, as well as, contextualized case studies, can be scaled up and out to other areas. The dilemma is that there are no shortcuts when it comes to building strong relationship, mutual learning and action. Such processes require dialogue and social time.

2.5.7 Limiting factors from full realization of the innovation's potential

There is of course a great many pitfalls that can arise when trying to develop and implement social and institutional innovations. It is not possible within the scope of this literature review to present all possible situations that may arise. But there are still a number of aspects that are possible to generalize about and where there is reason to be prepared. We highlight five general challenges. We have already mentioned the importance of basic values and attitudes from key actors, having the willingness to initiate collaborative processes possibly resulting in social and institutional innovations. Furthermore, specific competences are needed among initiators, enabling and supporting other stakeholders to start acting in a new direction. But there are some specific pitfalls that are worth mentioning.

An important pre-condition is the access to venues or arenas where actors can interact, learn from each other and innovate. Such "communities of practice" must be adapted to the relevant decision level (decision power), but also have the potential to bridge between levels (eg., Blackmore, 2010). Especially is the lack of vertical integration between decision levels in the governance structure resulting in a slow implementation and weak feedback between the local and (inter)national level. Several of the successful social and institutional innovations in this assessment proves to be proficient in both horizontal and vertical integration and collaboration.

Secondly, the initiatives taken have to be durable enough, project time and resources not too limited. Political persistence and courage is often needed to allocate the necessary resources for a long term commitment. Innovation for sustainable land use and socio-ecological sustainability is not a project it is a continuous endeavor, which requires ongoing interventions as well as external support. Several successful examples of social and institutional innovations in this review have worked systematically and for a long time, which in itself proved to be a success.

Thirdly, some form of process facilitation is required. We traditionally attach great importance to having an experienced project manager and to have the best expertise in decision-making processes, but sometimes lack a process designer and communicator. Such competence is particularly important from an implementation perspective. It is easy to be reverting to those activities that you recognize, such as informing specific target groups or arranging public hearings. Social and institutional innovations are to move beyond these approaches.

Fourth, we focus too much on quick fixes and too little on the process that makes future improvements possible of even complex and contentious issue. Our desire to achieve quick results and show that the actions taken have effect means that we downplay the importance of building stable relationships and working to create what are called "procedural consensus" among participating actors (Daniels and

Walker, 2001). Although the cost may be perceived as higher in the short term, as more work must be done on process issues initially, the experience shows that long-term profit and cost efficiency often is higher if you do just that.

Finally and fifthly so is the challenges of true and long-term participation sometimes underestimated (eg., Bawa et al, 2004; Mascia et al, 2003). Participation is neither the same as to have the right to decide, nor the same as only being physically present at a meeting. Real participation is something that occurs when a) participants can be heard, b) are respected for their perspective and c) has a real opportunity to influence the outcome of the joint discussions (Senecah, 2004). Specifically, this means that as a process facilitator you must create arenas and meeting places where actors can be heard, and when so, they have to be respected for their point of views (i.e., knowledge, experience and values). Finally, it should not stop at friendly gatherings, participation should result in concrete measures. The dilemma with expert-oriented decision-making is that it sometimes lack mandate. There are experts who are heard and their views will be respected and they have more power to influence the outcome of the discussion. This is not wrong per se, but if so it is important that the decision-making process, claiming to be participatory, makes the framework conditions clear and specify the desired level of participation from the very beginning (from informed consent and consulting to involvement in goal discussions, eg., Pretty, 1994). In the social and institutional innovations we have identified it seems that a common feature is that they have taken real participation very seriously and in many respects, been based on local actors' needs and perspectives.

2.6 Recommendations from the literature

External pre-conditions for social and institutional innovation

1. Ensure that there is a long term commitment and engagement of key stakeholders, not least those who initially have a funding responsibility.

2. Set reasonable time frames for cooperation, taking into account the social processes take time and that there are few shortcuts when relationships and trust should be created.

3. Ensure that those who participate in or captures the result of collaboration has the mandate to manage this in a credible way, that is, make sure that there is a receiver with the power to change (note that this may be a landowner).

4. Complement collaborative and social learning processes with directed incentives and / or support structures that help to target specific goals.

5. Progress and timing - do not wait for the perfect conditions before starting the process, it is about making progress, but make simultaneously sure that you have an ability to take opportunities when they arise (pre-planning as a key part of the process design).

Internally created conditions for increased cooperation and joint action

1. Ensure that the process facilitators have the right skills, the resources and the necessary mandate to take initiatives and carry out concrete activities.

2. Develop a comprehensive process design that describes the phases that will be included and aim to reach procedural consensus on key stakeholders for such a design.

3. Select the stakeholders and the appropriate actors, but be aware that in a social learning process a key competence is to be able to constantly re-organize activities, ie, do not let the forms of organization take control over its working methods.

4. Invite missing perspectives in the process, which should be seen as a way to critically question the knowledge-power-structures always emerging in collaborative efforts.

5. Ensure sustainability, accessibility and continuity of process and project management.

Activities and Processes

1. Work with a conscious process design that allows for an open agenda and possibilities to work iterative and experiential. Important phases are, in particular, the description of the situation you are in (rich picture), vision of what you want to accomplish, concrete proposals for action, domain critical situations, as well as responsibility and resource allocation.

2. Focus on learning between participants by involving them in different ways. Everyone can contribute to problems understanding, vision, action proposals, fair discussions, etc.

3. As the coordinator/facilitator, it is important to meet people where they are, to take the starting point from their perspectives, needs and circumstances. Once the process has started, you can set higher demands on reciprocity.

4. Vary the methods and techniques used since different actors / participants have different preferences and abilities.

5. Ensure that each activity contributes to progress and make you move closer to the shared goal. Make clear for the participants what and how progress is made.

6. Create success stories (story-telling) in order to reinforce a positive development and a sense of accomplishment and pride.

Results and effects

1. Catch all the current results of the collaboration, including that which has not to do with the formal attainment. The benefits of collaboration are often wider than the objectives set up from the beginning.

2. Involve participants in monitoring and to make management decisions, that is, develop together the system for performance monitoring (including hardware, software and orgware issues).

3. Ensure that there is financial scope for external and preferably formative evaluation throughout the project.

2.7 Recommendations to the Learning Areas for the identification and description of social and institutional innovations

The description of the HNV innovations in the LAs should follow the template provided to ensure coherence and comparability between them. The recommendations provided in this section reflect the findings of the literature review and aim to help the narrative of the innovation vis-à-vis the Baseline Assessment in WP1 and assessment of effects of the innovation to the socio-economic status

of HNV farming, farms and communities. Therefore, they should be treated as having an orientation and guidance function as opposed to a step-by-step instructive role.

One argument made in the case studies as well as in theoretical contributions regarding social and institutional innovations is that a process perspective is necessary. This does not mean to work ad hoc or without plans, rather the contrary. Someone once said that 'nothing is as planned as an open and participatory process', meaning that one has to have a process design and a preparedness for what is supposed as well as what might happen over time. Flood (1999) describe the entrance point to social, complex processes as "balancing *mystery* with *mastery* means living somewhere between the hopelessness of the belief that we are unable to understand anything and, at the other extreme, the naivety of the belief that we can know everything". Social and institutional innovations are very much about balancing between a similar and perpetual dilemma of implementing best available knowledge (contextual and de-contextualized) while at the same time letting people's values and ideas influence the outcome (social acceptance and sustainability). To be able to manage and facilitate such processes one has to be ethical alert, systems- and self-critical, entrepreneurial and constantly focus on experiential learning and concrete measures for making progress.

In Figure 2.3 we describe how a general process design might look like. It starts with creating as good pre-conditions as possible by planning activities. The challenge being that one has to work with complexity and conflicts due to multiple goals. Participatory approaches are necessary to find common ground and procedural consensus. Initially one often has to build local capacity, both through public education and by experiential learning, while it is also about a better understanding of the landscape in which you live and work. By these activities, if facilitated in a good way, stakeholders will build trust and stronger relations. This will enable them to develop their co-operation and together innovate, developing products, markets, techniques, etc. Central to this is funding and developing new business models. Being successful it might result in an increased interest from public and regional/(inter)national authorities, resulting in public-private partnerships and supportive policies enabling scaling up and out of the innovations made. As a potential outcome (or innovation in itself) this process has resulted in new institutions which are better prepared to manage and sustain HNV farming systems, or as the Nobelprize-winner Elinor Ostrom put it 'it takes complex institutions to manage complex processes'. This and similar process designs will probably have a better possibility to improve the social sustainability and economic viability of HNV farms and communities, compared to existing activities and incentives.

Recommendations: Basic innovation behaviour to be identified

The relational dimensions

While HNV farming systems are overtly about substantive matters, progress on them often hinges on the quality of the relationships that exist among actors and stakeholders. Consequently, although assessment can begin at any part of socio-ecological systems, in many cases examining who the stakeholders are and the relationship between them may be insightful. The relational dimensions include stakeholders involved and their history with one another. It also includes the "intangibles" of any complex social situation, such as trust, respect and legitimacy. The following questions may help in the assessment of the relational dimensions of a policy conflict.

1. Who are the stakeholders?
2. Do any stakeholder have unique status (e.g., traditional rights)?

3. What are the stakeholders':
   * Stated positions?
   * Interests (concerns, fears. goals)?
   * Worldviews and values?
4. What are the stakeholders' relational histories?
5. What are the stakeholders' incentives to:
   * Change existing situation?
   * Collaborate?

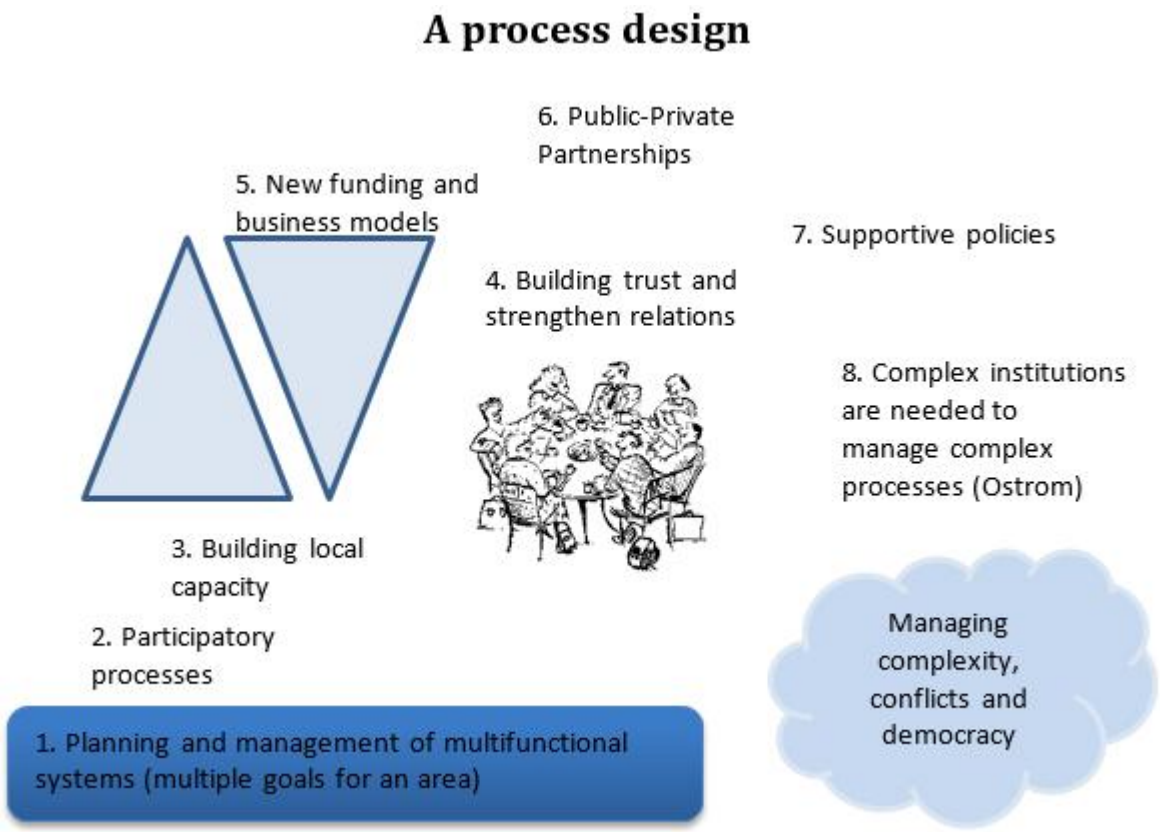


Figure 2.3. Social and institutional innovations can both be a whole process design or part of an overall process. The figure illustrates a general process perspective on social and institutional innovations which can be recognised in many case studies all of Europe.

   * Compete?
   * Learn?

6 What are the stakeholders' best alternative to enter a collaborative process (do they reach their goals easier by not collaborating)?

7. Is trust sufficient? Can it be built?
8. Can representatives/individuals among the stakeholder groups work together?
   * Are representatives available for the long-term or likely to change?
   * Are representatives restricted by constituents?
9. Do the stakeholders have adequate knowledge and skills?
   * To process information and develop a systemic thinking?
   * To communicate constructively and work through potential disagreements?

* To interact with acknowledgement and respect?

The procedural dimension

Procedural dimensions include those elements that pertain to the ways in which social and institutional innovations are managed and how decisions are made. It also includes the rules, both regulative and generative, that stakeholders adhere to in working through complex issues. Just as progress on the substance relies in part on relational factors, so too does it depend on that procedures are regarded as appropriate and fair by stakeholders. The following questions can guide assessment of the procedural dimensions.

1. At what stage is the social or institutional innovation?
2. Which legal constraints impact the innovativeness of the process?
3. Who has jurisdiction to enable real change?
4. What management approaches have been used in the past (procedural history)?
5. Is mutual learning desired by key actors?
6. What is the decision space, that is, how can participant influence final decisions?
7. Are resources sufficient (e.g., time, funding, competence)?
8. What are the procedural alternatives? How accessible are they? How inclusive?
9. Are there needs for an impartial party to take responsibility for process design and facilitation?

The substantive dimensions

Substantive items are the "tangible" aspects of social and institutional innovations, such as the issues about which stakeholders have a common interest in. Substance, though, also includes issues that stakeholders may consider "symbolic," such as changing power asymmetries. The following set of questions offers a framework for assessing substance.

1. What are the issues?
    * What are the tangible issues?
    * What are the symbolic issues?
2. What are the likely sources of tension over these issues (e.g., facts, culture, history, jurisdiction, values, interests, people)?
3. Are issues complex (technical, expert dependent, experiential, etc)?
4. Is information needed? Is it available?
5. Are meanings, interpretations, and understandings quite varied among stakeholders?
6. What are the mutual gain options (opportunities for mutually beneficial improvements)?

The importance of social capital for social innovation

Social capital has a potential of enabling cooperation based on mutual trust and shared norms and values in a LA. Social and institutional innovations come into being through social interaction and learning processes consisting of identifying social needs, creating new solutions and their implementation. This is why many development processes involve social capital and learning. The more traditional modes are based on personal contacts between different stakeholders. In newer ones, communicative skills and a will to learn to manage complexity plays a much more important role. Assessing new forms, roles and interlinkages of social capital and knowledge, and their contribution to innovative solutions might therefore be relevant. Question to consider is:

6. What are the local/regional relationship between social capital and social innovation?
7. What examples of traditional and new patterns of social innovation exist?
8. Can social capital be strengthened to sustain new solutions to the existing challenges?
9. What learning modes and knowledge sources does stakeholder use; in particular, what is the role of local, tacit, informal knowledge and social learning in the LA?
10. How are social innovations, social organisation and knowledge and learning processes interlinked with the dominating agricultural and rural governance and knowledge structures?

(How to) define/describe HNV social and institutional innovations at LA level? (How to) define/describe the innovation initiators and participants/ stakeholders/ followers? (How to) describe the life stage of the innovation (process)? How HNV social and institutional innovations have developed – current changes and state of the art in the LA? (Which) drivers or obstacles to look for in HNV social and institutional innovations? (How to) define/describe the impact of the HNV social and institutional innovations at LA level?

Existing social and institutional innovations

An important part of the LA assessment of social and institutional innovations is of course to identify and describe existing social innovations in the area. Table 2.2 gave an overview of the many different organisational forms that might exist. This can be used as a way to direct the focus of assessment to the many different forms that social and institutional innovation can take.

It could be relevant to make an historical description of how the innovation was initiated, who were involved, and what the overall aims were. One could use figure 2.1 as a checklist and try to describe the social and institutional structure and activities accordingly. We believe it is important to have a process perspective when describing these innovations because it tend to have high explanatory value. The headlines in figure 2.1 can be transformed into “windows” from which each innovation could be described.

Development, drivers, obstacles and impact

The best way to do a broader analysis of the social and institutional innovation is actually to use some of the existing tools often used in process facilitation or participatory research. This could be stakeholder analysis methodology, historical time lines, rich picturing, etc. One important aspect is to do these analytic activities together with (some of) the actors involved. A much thicker description of the situation is then possible, compared if one do it yourself or by interviews.

All the earlier suggested questions, relating to the softer side of social and institutional innovations, are preferably asked in workshops with the stakeholders within the LA. What is important is what stakeholders’ perceive because that will guide their actions. It is also important to talk about the different systems level of social and institutional innovations, not only the historical development. This would then include external pre-conditions for innovation, internally created conditions for innovation, activities and processes that support or hinder innovation, and feedback loops in the system/outcomes/domino effects/changes due to innovations that have taken place, etc. These aspects are partly captured in Figure 2.1.

2.8 References

Akeroyd, J.R. and Page, J.N. 2011. Conservation of high nature value (HNV) grassland in a farmed landscape in Transylvania. Contribu¸tii Botanice 46: 57–71.

Albert C, Zimmermann, T, Knieling, J, and von Haaren C. 2012. Social learning can benefit decision-making in landscape planning: Gartow case study on climate change adaptation, Elbe valley biosphere reserve. Landscape and Urban Planning 105:347–360.

Ansell, C., and Gash, A. 2008. Collaborative governance in theory and practice. Journal of Public Administration Research and Theory, 18, 543–571.

Antonacopoulou, E. P., and Meric, J. 2005. From power to knowledge relationships: Stakeholder interactions as learning partnerships. Pesqueux, Y., and Bonnafous-Boucher, M. (Eds.) Stakeholder theory: A European perspective. New York, NY: Palgrave Macmillan, pp. 125–147.

Bager, T and Proost, J. 1997. Voluntary regulation and farmers' environmental behaviour in Denmark and the Netherlands. Sociologia Ruralis, 37:1, pp 79-96.

Bawa, K.S., Seidler, R. and Raven, P.H. 2004. Reconciling Conservation Paradigms. Conservation Biology 18 (4), 859-860.

Beers, P.J., Veldkamp, A., Hermans, F., van Apeldoorn, D., Vervoort, J.M., and Kok, K. 2010. Future sustainability and images. Futures, 42, 723–732

Berkes, F and Folke, C. (Eds.). 1998. Linking social and ecological systems. Management practices and social mechanisms for building resilience. Cambridge: Cambridge University Press.

Berkhout, F. 2006. Normative expectations in systems innovation. Technology Analysis and Strategic. Management Journal, 18, 299–311

Blackmore, C (Ed.). 2010. Social Learning Systems and Communities of Practice. Springer.

Blackmore, C., Ison R, and Jiggins J. 2007. Social learning: an alternative policy instrument for managing in the context of Europe's water. Environmental Science and Policy 10:493–586.

Bogason, P. et al. (Eds.) 2004. Tampering with traditions: The unrealized authority of democratic agency. New York, NY: Lexington Books.

Bohman, J. 2000. Public deliberation: Pluralism, complexity, and democracy. Cambridge, MA: MIT Press.

Bohnet, I C., and Konold, W. 2015. New approaches to support implementation of nature conservation, landscape management and cultural landscape development: experiences from Germany's southwest. Sustainability Science, 10:245–255.

Börzel, T. and Buzogány, A. 2010. Environmental organizations and the Europeanisation of public policy in Central and Eastern Europe: the case of biodiversity governance. Environmental Politics 19(5): 708–735.

Bos, B., Groot Koerkamp, P.W.G., Gosselink, J.M.J., and Bokma, S. 2009. Reflexive interactive design and its application in a project on sustainable dairy husbandry systems. Outlook on Agriculture, 38, 137–145

Bosworth, G., Rizzo, F., Marquardt, D., Strijker, D., Haartsen, T., and Aagaard Thuesen, A. 2016. Identifying social innovations in European local rural development initiatives. Innovation: The European Journal of Social Science Research, 29:4, 442-461.

Braun, A.R. and Hocde, H. 2000. Farmer participatory research in Latin America: Four cases. Stur, W.W., P.M. Horne, J.B. Hacker, and P. C. Kerridge (Eds.) Working With Farmers: The Key to the Adoption of Forage Technologies. Australian Center for International Research: Canberra

Brown, K. 2003. Three challenges for real people centred conservation. Global Ecology and Biogeography, 12, 89-92.

Bryden, J. 2002. Aspects of individual farm development and rural development in Western Europe. Keynote Paper. FAO Seminar on Individual Farms in CEE and CIS Countries, Budapest, 28-29 September 2001. Se-dik, D (Ed.) Individual Farms in Eastern Europe and the Commonwealth of Independent States. Rome, FAO, 2002

Bürgi, M., Plieninger, T., Palang, H., and Bieling, C. 2016. HERCULES Sustainable futures for Europe's HERitage in CULtural landscapES: Tools for understanding, managing, and protecting landscape functions and values. D3.4 Summary report on factors fostering resilience of cultural landscapes.

Buss, T. F., Redburn, F. S., and Guo, K. 2006. Modernizing democracy: An overview of the issues. Buss, T. F., Redburn, F. S., and Guo, K. (Eds.). Modernizing democracy: Innovations in citizen participation. Armonk, NY: M. E. Sharpe, pp. 3–28.

Carlberg, A. 2005. Knowledge transfer between researchers and practitioners in Sucozoma. AMBIO 34: 2, pp. 176-180.

Carpenter, S. and Kennedy, W.J.D. 1988. Managing public disputes: A practical guide to handling conflict and reaching agreements. San Francisco, CA: Jossey-Bass.

Chaniotis, P and Stead, S. 2007. Interviewing people about the coast on the coast: Appraising the wider adoption of ICZM in North East England. Marine Policy, 31, pp. 517-526.

Chapin, F. S., Kofinas, G P., and Folke, C. (Eds). 2009. Principles of ecosystem stewardship: resilience-based natural resource management in a changing world. Springer, Berlin, Germany.

Checkland, P. 2000. Soft Systems Methodology: A thirty year retrospective. Systems Research and Behavioral Science, 17, pp 11-58.

Cheng, A. 1999. Conflict, Collaboration, and the Politics of Place: Examining the Social Dynamics of Collaborative Watershed Planning. Dissertation at the Department of Forest Resources, Oregon State University. Corvallis, OR: OSU.

Colle, R. C. 2007. Advocacy and interventions. Readings in communication and development. Ithaca, NY: The Internet-First University Press.

Conley, A and Moote, A. 2000. Evaluating collaborative and community-based natural resource management: An assessment. Paper presented at the 8th International Symposium on Society and Resource Management, June 18th, 2000.

Conley, A and Moote, A. 2001. Collaborative conservation in theory and practice: A literature review. The Udall Center for Studies in Public Policy, University of Arizona.

Cox, R. 2006. Environmental communication and the public sphere. London: Sage Publ.

Crona, B., and Parker, J. N. 2012. Learning in support of governance: theories, methods, and a framework to assess how bridging organizations contribute to adaptive resource governance. Ecology and Society 17(1): 32. http://dx.doi.org/10.5751/ES-04534-170132/

Daniels, S and Walker, G. 2001 Working through environmental conflicts: The collaborative learning approach. Westport, CT: Praeger.

Darnhofer, I, Gibbon D. and Dedieu, B. (Eds.). 2012. Farming Systems Research into the 21st Century: The New Dynamic. Dordrecht: Springer.

Delli Carpini, M. X., Cook, F. L., and Jacobs, L. R. 2004. Public deliberation, discursive participation, and citizen engagement: A review of the empirical literature. Annual Review of Political Science, 7, 315–344.

Depoe, S. et al (Eds.). 2004. Communication and public participation in environmental decision making. Albany, NY: SUNY Press.

Dietz, T., and Stern. P. 2002. New tools for environmental policy: Education, information and voluntary measures. Washington, D.C: National Academy Press.

Dilling, L and Moder, S. 2007. Introduction. Moder, S and Dilling, L. (Eds.) Creating a climate for change: Communicating climate change and facilitating social change. Cambridge, UK: Cambridge University Press.

Dilworth, R., Gowdie, T. and Rowley, T. 2000. Living landscapes: The future landscapes of the Western Australian wheat belt. Ecological Management and Restoration 1(3): 165-174

Downing, M., Volk, T.A. and Schmidt, D.A. 2005. Development of new generation cooperatives in agriculture for renewable energy research, development, and demonstration projects. Biomass and Bioenergy, 28(5), 425-434.

Dukes; F., Firehock, K., and Birkoff, J. (Eds.) 2011. Community-Based Collaboration: Bridging Socio-Ecological Research and Practice. University of Virginia Press.

Dunford, B. 2003. The impacts of agricultural practices on the natural heritage of the Burren. PhD thesis, University College Dublin.

Eik, K et al. 2006. Communicating for results. A communications planning guide for international water projects. Second draft. Paris: UNDP.

Ellorieta, B and Sanchés-Aguilera, D. 2011. Landscape regulation in regional territorial planning: A view from Spain. Jones, M and Stenseke, M. (Eds.) The European Landscape Convention: Challenges of Participation. Springer, pp 99-120.

Elzen, B., and Wieczorek, A. 2005. Transitions towards sustainability through system innovation. Technology Forecast and Social Change, 72, 651–661

Ernesto Méndez, V., Bacon, C.M. and Cohen, R. 2013. Agroecology as a transdisciplinary, participatory, and action-oriented approach, Agroecology and Sustainable Food Systems 37(1): 3-18.

Esselin, A & Ljung, M. 2006. Bridging the gap: The Mountain Mistra Programme as an arena for collaborative learning. The International Journal of Biodiversity Science and Management, 2:4, pp 315-325.

European Commission. 2014. Social Innovation. Accessed July 15, 2014. http://ec.europa.eu/enterprise/policies/innovation/policy/social-innovation/index_en.htm.

Farmpath. 2014. Regional sustainability transitions: High Nature Value Farming. James Hutton, UK.

Ferraz-de-Oliveira, M.I., Azeda, C. and Pinto-Correia, T. Management of Montados and Dehesas for High Nature Value: An interdisciplinary pathway. Agroforestry Systems 90:1.

Fischer, F. 2000. Citizens, experts, and the environment: The politics of local knowledge. Durham: Duke University Press.

Fisher, R & Ury, W. 1981. Getting to yes: Negotiating agreement without giving in. New York: Penguin Books.

Fiske, J. 1982. Introduction to Communication Studies. London: Routledge.

Flood, R. 1999. Rethinking the fifth discipline. Learning within the unknowable. London: Routledge.

Folke, C., et al. 2003. Synthesis: building resilience and adaptive capacity in social – ecological systems. Berkes, F., Folke, C., and Colding; J. (Eds.) Navigating social-ecological systems: building resilience for complexity and change. Cambridge, UK: Cambridge University Press.

Folke, C. et al. 2005. Adaptive governance of social-ecological systems. Annual Review of Environment and Resources, 20, pp. 441-473.

Franks, J. R. and McGloin, A. 2007. Joint submissions, output related payments and environmental co-operatives: Can the Dutch experience innovate UK agri-environment policy? Journal of Environmental Planning and Management 50(2): 233 - 256.

Fung, A., and Wright, E. O. 2001. Deepening democracy: innovations in empowered participatory governance. Politics and society, 29, 5–42.

Gardner, G and Stern, P. 1996. Environmental problems and human behavior. Boston, MA: Allyn & Bacon.

Gatzweiler, F W. 2016. Institutional and Technological Innovations in Polycentric Systems: Pathways for Escaping Marginality. Gatzweiler, F W and von Braun, J (Eds.). Technological and Institutional Innovations for Marginalized Smallholders in Agricultural Development. London: Springer Open.

Gehrlein U, Steil C and Demuth S. 2013. Abschlussevaluation des PLENUM-Programms im Projektgebiet Schwäbische Alb. Institut für Ländliche Strukturforschung, Johann Wolfgang Goethe-Universität Frankfurt/Main

Gibbons, M. 1999. Science's new social contract with society. Nature 402, C81 - C84.

Gibson, C. 2001. From knowledge accumulation to accommodation: Cycles of collective cognition in work groups. Journal of Organizational Behavior, 22, pp 121-134.

Gillberg, Minna. (1999). From Green Image to Green Practice. Normative Action and Selfregulation. Doctoral Thesis. Lund: Studies in Sociology of Law nr 6.

Glasbergen, P. 1995. Project management for water conflicts. An analysis of factors conducive to success or failure. Glasbergen, P. (Ed.). Managing Environmental Disputes. Network Management as an Alternative. Dordrecht, NL: Kluwer Academic Press.

Goldman, R. L., Thompson, B. H. and Daily, G. C. 2007. Institutional incentives for managing the landscape: Inducing cooperation for the production of ecosystem services. Ecological Economics 64(2): 333-343.

Gómez-Baggethun, E., Mingorría, S., Reyes-García, V., Calvet, L., and Montes, C. 2010. Traditional ecological knowledge trends in the transition to a market economy: empirical study in the Doñana natural areas. Conservation Biology 24:721-729.

Gray, B. 1989. Collaborating: Finding common ground for multiparty problems. San Fransisco, CA: Jossey-Bass.

Grin, J and van de Graaf, H. 1996. Implementation as communicative action. An interpretative understanding of interactions between policy actors and target groups. Policy Sciences, 29, pp 291-319.

Habron, G. 2000. An assessment of community-based adaptive watershed management in three Umpqua basin watersheds. Doctoral dissertation at Oregon State University, USA. Corvallis, OR: Oregon State University.

Hahn T, Olsson P, Folke C, Johansson K. 2006. Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive co-management of a wetland landscape around Kristianstad, Sweden. Human Ecology 34:573–592

Hajer, M. 1997. The politics of environmental discourse: Ecological modernisation and the policy process. London: Oxford University Press.

Hallgren, L. 2003. I djupet av ett vattendrag. Om konflikt och samverkan vid naturresurshantering. Doctoral thesis. Agraria 379. Department of Landscape Planning Ultuna, SLU. Uppsala: SLU.

Hallgren, L. and Ljung, M. 2005. Miljökommunikation – aktörsamverkan och processledning. Lund: Studentlitteratur.

Hermans, F., Stuiver, M., Beers, P.J., and Kok, K. 2013. The distribution of roles and functions for upscaling and outscaling innovations in agricultural innovation systems. Agricultural Systems 115 (2013) 117–128

Höll, N. 2014. Instrumente zur Erhaltung der Kulturlandschaften. In: Landespflege Freiburg, Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg. Kulturlandschaften in Baden-Württemberg. G. Braun Buchverlag, Karlsruhe, Germany, pp 240–245

Horcea-Milcu, A I. 2015. The relationship between people and nature in traditional rural landscapes: a case study from Southern Transylvania. Doctoral thesis. Faculty of Sustainability of Leuphana University

Hounkonnou, D., Kossou, D., Kuyper, T. W., Leeuwis, C., Nederlof, E. S., Röling, N., and van Huis, A. 2012. An innovation systems approach to institutional change: smallholder development in West Africa. Agricultural systems, 108, 74-83.

Huggins, R. and Hindle, R. 2010. Opportunities and Barriers to Business Innovation in Rural Areas. Interim Report: Theory and Evidence. Department for Environment, Food and Rural Affairs (DEFRA).

Hulme, D. and Murphree, M. 1999. Communities, wildlife and “new-conservation” in Africa. Journal of International Development 11, pp. 277-285.

Isaacs, D. 1999. Dialogue and the art of thinking together. New York: Doubleday.

Ison, R. 2010. Systemic Inquiry. In Ison, R. Systems Practice: How to Act in a Climate-Change World. Springer London, pp. 243-265.

Ison, R., Collins, K., Colvin, J., Jiggins, J., Roggero, P. P., Seddaiu, G., and Zanolla, C. 2011. Sustainable catchment managing in a climate changing world: new integrative modalities for

connecting policy makers, scientists and other stakeholders. Water resources management, 25(15), 3977-3992.

Ison, R., Röling, N., and Watson, D. 2007. Challenges to science and society in the sustainable management and use of water: investigating the role of social learning. Environmental Science & Policy, 10(6), 499-511.

Jamal, T., and Stronza, A. 2009. Collaboration theory and tourism practice in protected areas: Stakeholders, structuring and sustainability. Journal of Sustainable Tourism, 17, 169–189.

Jellinek, Å. 2006. Ekologiskt kopplade institutioner inom jordbrukssystemet [Ecologically coupled institutions in the agri-food system]. Master thesis. Department of Urban and Rural Development. SLU.

Kaplan, I. and McCay, B. 2004. Cooperative research, co-management and the social dimension of fisheries sciences and management. Marine Policy, 28, pp. 257-258.

Keep, Helen and John Akrigg. 2014. High Nature Value Farming in the Yorkshire Dales Buckden parish case study. Yorkshire Dales National Park Authority

Kenney, D. 2000. Arguing About Consensus: Examining the case against western watershed initiatives and other collaborative groups active in natural resource management. Boulder, CO: Natural Resources Law Center, University of Colorado School of Law.

Kenward, R. E., et al. 2011. Identifying governance strategies that effectively support ecosystem services, resource sustainability, and biodiversity. Proceedings of the National Academy of Sciences of the United States of America 108:5308-5312.

Kilpatrick, S., Bond, L., Bell, R., Knee, J., and Pinkard, G. 2003. Effective farmer groups for defining best practices for sustainable agriculture. APEN, Australia.

King, C. 2000. Systemic processes for facilitating social learning: Challenging the legacy. Doctoral Thesis. Agraria 233. Department of Urban and Rural Development, SLU. Uppsala: SLU.

Klerkx, L., Aarts, N., and Leeuwis, C. 2010. Adaptive management in agricultural innovation systems: The interactions between innovation networks and their environment. Agricultural Systems 103 (2010) 390–400

Klerkx, L., van Bommel, S., Bos, B., Holster, H., Zwartkruis, J V., and Aarts, N. 2012. Design process outputs as boundary objects in agricultural innovation projects: Functions and limitations. Agricultural Systems 113 (2012) 39–49

Knickel, K and Kok, K. 2003. Future Land Use in Europe: Trends, Challenges and Policy (FLU-E). A scoping paper for EFIEA. Frankfurt/Main.

Knickel, K., Renting, H., and van der Ploeg, J D. 2003. Multifunctionality in European agriculture. Brouwer, F. (Ed.) Sustaining agriculture and the rural economy: Governance, policy and multifunctionality. Edward Elgar Publishing Inc.

Kroma, M. 2006. Organic Farmer Networks: Facilitating Learning and Innovation for Sustainable Agriculture, Journal of Sustainable Agriculture, 28:4, 5-28.

Landesanstalt für Umwelt Messungen und Naturschutz Baden-Württemberg. 2011. PLENUM. Zukunft für Mensch und Natur— Natur schützen, Regionen stärken, Vielfalt erhalten. Stuttgart.

Lee, K. 1993. Compass and Gyroscope: Integrating science and politics for the environment. Washington: Island Press.

Leeuwis, C. and Pyborn, R. (Eds.). 2002. Wheelbarrows full of frogs: Social learning in rural resource management. Assen, NL: Van Gorcum.

Leeuwis, C. and van den Ban, A. 2004. Communication for rural innovation: Rethinking agricultural extension. London: Blackwell.

Leeuwis, C. (Ed.) 1999. Integral design: Innovation in agriculture and resource management. Wageningen, NL: Wageningen Academic Publ.

Leeuwis, C. 2000. Learning to be Sustainable. Does the Dutch Agrarian Knowledge Market Fail? Journal of Agricultural Education and Extension 7 (2): 79-92.

Lidskog, R and Elander, I. 1999. På väg mot en ekologisk demokrati? Demokratiteoretiska responser på den ekologiska utmaningen. Aronsson, P et al. Demokrati och medborgarskap. Demokratiutredningens forskarvolym II, SOU 1999:77. Stockholm: Fritzes Förlag.

Ljung, M, Gibbon, D and Richert, R. 2000. Extended study circles as a means of facilitating change towards sustainable management of ecosystems: Is there a new role for agricultural universities? Doppler, W and A Koutsouris (Eds.). Rural and Farming Systems Analyses: Environmental Perspective. Proceedings of the 3rd European Symposium of the Association of Farming Systems Research and Extension in Hohenheim, Germany, March 25-27th, 1998. Weikersheim: Margraf Verlag, pp 283-294.

Ljung, M, and Källström Nordström, H. 2013. Miljöåtgärder i samverkan – strategier för att inspirera till miljöåtagande [Collaborative environmental measures – strategies to motivate environmental commitments]. Report 2013:31. Jönköping: The Swedish Board of Agriculture.

Ljung, M. 2001. Collaborative learning for sustainable development of agri-food systems. Doctoral Thesis. Agraria 308. Department of Landscape Planning Ultuna, SLU. Uppsala: SLU.

Ljung, M. 2001. The Farmers' Dialogue: Developing guidelines for a sustainable agriculture. B Short et al (Eds.). Proceedings of the 5th biennial Conference on Communication and the Environment, 24-27th of July, 1999. Flagstaff, AZ: Northern Arizona University.

Loucks, L. 2007. Patterns of fisheries institutional failures and success: Experience from the Southern Gulf of St. Lawrence snow crab fishery, in Novia Scotia, Canada. Marine Policy, 31, pp. 320-326.

Lundgren, L, et al. 2002. Miljöns mänskliga dimension. En studie av humanistisk och samhällsvetenskaplig miljöforskning. Vetenskapsrådets rapportserie, rapport 2002:8. Stockholm: Vetenskapsrådet.

Lundgren, L. 2000. (Ed.). Knowing and Doing. On the knowledge and action in environmental protection. Stockholm: Naturvårdsverkets förlag.

Luz, F. 2000. Participatory landscape ecology—a basis for acceptance and implementation. Landscape and Urban Planning, 50:157–166

Mascia, M.B., Brosius, J.P., Dobson, T.A., Forbes, B.C., Horowitz, L., McKean, M.A. and Turner, N.J. 2003. Conservation and the Social Sciences. Conservation Biology 17 (3), 649-650.

McCay, B and Jentoft, S. 1996. From the bottom up: Participatory issues in fisheries management. Society and Natural Resources, 9, pp 237-250.

Meppem, T and Gill, R. 1998. Planning for sustainability as a learning concept. Ecological Economics, 26:2, pp 121-137.

Meppem, T. 2000. The discursive community: Evolving institutional structures for planning sustainability. Ecological Economics, 34:1, pp 47-61.

Mikulcak, F., Newig, J., Milcu, A. I., Hartel, T., and Fischer, J. 2013. Integrating rural development and biodiversity conservation in Central Romania. Environmental Conservation 40 (2): 129–137.

Mitchley, J., Price, M., and Tzanopoulos, J. 2006. Integrated Futures for Europe's Mountain Regions: Reconciling Biodiversity Conservation and Human Livelihoods. Journal of Mountain Science 3:4, 276~286.

Molnár, Z., Kis, J., Vadász, C., Papp, L., Sándor, I., Béres, S., Sinka, G., and Varga, A. 2016. Common and conflicting objectives and practices of herders and conservation managers: the need for a conservation herder. Ecosystem Health and Sustainability

Moulaert, F., MacCallum, D., Mehmood, A., and Hamdouch, A. (Eds.). 2013. The International Handbook on Social Innovation. Collective action, social learning and transdisciplinary research. Cheltenham, UK: Edward Elgar.

Muessner, R. and Sousa Pinto, I. 2005. Networking - New buzzword in Biodiversity Research or Advantage for Conservation. Vella, A. (Ed.) 2005: Biodiversity – our natural capital. Research and actions towards conservation. Valetta, Malta, 178 pp.

Muessner, R. 2005a. Nature Conservation Approaches in Cultural Landscapes of Europe. Dissertation zur Erlangung des Doktorgrades der Naturwissenschaften. Fachbereich Biologie der Philipps-Universität Marburg, Germany.

Muessner, R. 2005b. How to improve integrative planning and land use instruments in cultural landscapes? McCollin, D. and Jackson, J. (Eds) 2005: Landscape Ecology: Planning, People and Practice. The landscape ecology of sustainable landscapes. Proceedings of the 13th Annual IALE (UK) Conference, Northampton, p.141-150.

Murray, R., Caulier-Grice, J. and Mulgan, G, 2010. The Open Book of Social Innovation. Social Innovator Series: Ways to design, develop and grow social innovation. Nesta & The Young Foundation.

Mutz, D. C. 2006. Hearing the other side: Deliberative versus participatory democracy. New York, NY: Cambridge University Press.

Mutz, D. C. 2008. Is deliberative democracy a falsifiable theory? Annual Review of Political Science, 11, 521–538.

Nitsch, U. 1999. The art of environmental communication. Lundgren, L. (Ed.) Knowledge and Action in the Environmental Field. Stockholm: Naturvårdsverkets förlag.

Norgaard, R., 1984. Co-evolutionary development potential. Land Economics, 60 (2), 160–173.

Novotny, H. et al. 2001. Re-thinking science. Knowledge and the public in an age of uncertainty. Cambridge, UK: Polity Press.

Nybacka-Willner, M. 2006. Från forskningsinformation till forskningskommunikation. Meddelande från Åbo Akademi, nr 10, sid.10-11. Åbo, Finland: Åbo Akademi.

Nyikahadzoi, K., Pali, P,, Fatunbi A.O, Olarinde L.O, Njuki J, and Adekunle A.O. 2012. Stakeholder Participation in Innovation Platform and Implications for Integrated Agricultural Research for Development (IAR4D). International Journal of Agriculture and Forestry. 2 (3), 92-100.

Olsson, P., Folke, C., Galaz, V., Hahn, T., and Schultz, L. 2007. Enhancing the fit through adaptive co-management: creating and maintaining bridging functions for matching scales in the Kristianstads Vattenrike Biosphere Reserve, Sweden. Ecology and Society 12(1): 28. [online] URL: http://www.ecologyandsociety.org/vol12/iss1/art28/

Ostrom, E. 2005. Understanding institutional diversity. Princeton, NJ: Princeton University Press.

Otsuki, K. 2011. Sustainable partnerships for a green economy: A case study of public procurement for homegrown school feeding. Natural Resources Forum, 35: 213-222.

Paine, M. et al. 1998. The Study Group Process. A Group Learning to the Alignment of Production and Resource Management Goals. AgResearch. Ruakura.

Pearce, W and Cronen, V. 1980. Communication, action, and meaning: The creation of social realities. New York, NY: Praeger.

Pelling, M., and High, C. 2005. Understanding adaptation: what can social capital offer assessments of adaptive capacity? Global Environmental Change, 15(4), 308-319.

Philipsen, G. 1995. The coordinated management of meaning theory of Pearce, Cronen, and associates. Cushman, D., and Kovacic, B. (Eds.) Watershed Research Traditions in Human Communication Theory. Albany: SUNY, pp. 13-43.

Pimbert, M.P. 2011. Participatory research and on-farm management of agricultural biodiversity in Europe. London: IIED.

Pinto-Correia, T and Kristensen, L. 2013. Linking research to practice: The landscape as the basis for integrating social and ecological perspectives of the rural. Landscape and Urban Planning 120, pp 248–256

Pleasant, A. et al. 2001. The literature of environmental communication. Aepli, M-F et al (Eds.). Proceedings of the 6th Biennial Conference on Communication and Environment. Cincinnati, Department of Communication, University of Cincinnati.

Plieninger, T., Bieling, C., Ohnesorge, B., Schaich, H., Schleyer, C., and Wolff, F. 2013. Exploring futures of ecosystem services in cultural landscapes through participatory scenario development in the Swabian Alb, Germany. Ecology and Society, 18:39

Plieninger, T., and Bieling, C. 2013. Resilience-based perspectives to guiding high-nature-value farmland through socioeconomic change. Ecology and Society, 18(4).

Polman, N. B. P. 2002. Institutional Economics Analysis of Contractual Arrangements; Managing Wildlife and Landscape on Dutch Farms. PhD thesis, Wageningen University, Wageningen.

Powell, N. S., Larsen, R. K., and van Bommel, S. 2014. Meeting the 'Anthropocene'in the context of intractability and complexity: infusing resilience narratives with intersubjectivity. Resilience, 2(3), 135-150.

Pretty, J.N. 1994. Alternative systems of inquiry for sustainable agriculture. IDS Bulletin 25(2): 37-48, Institute of Development Studies, University of Sussex: Brighton.

Priscoli, J.D. 1988. Conflict resolution in water resources: Two 404 general permits. Journal of Water Resources Planning and Management, 114:1, pp 66-77.

Priscoli, J.D. 1997. Participation and conflict management in natural resource decision making. Solberg, B and Miina, S. (Eds.) Conflict management and public participation in land management. EFI Proceedings No 14. Joensuu, FI: European Forest Institute, pp 61-88.

Ramirez, A. 2013. The Influence of Social Networks on Agricultural Technology Adoption. Procedia - Social and Behavioral Sciences 79: 101 – 116

Reason, P, and Bradbury, H. 2001. Handbook of action research: participative inquiry and practice. Thousand Oaks, CA: SAGE Publ.

Rescia, A. J., Willaarts, B. A., Schmitz, M. F., and Aguilera, P. A. 2010. Changes in land uses and management in two Nature Reserves in Spain: Evaluating the social–ecological resilience of cultural landscapes. Landscape and Urban Planning, 98, 26-35.

Renn, O. 2006. Participatory processes for natural resource management. In S. Stoll- Kleeman & M. Welp (Eds.), Stakeholder dialogues in natural resource management. Berlin, Germany: Springer, pp. 13–16.

Ribeiro, P. F. et al. 2014. Modelling farming system dynamics in High Nature Value Farmland under policy change. Agriculture, Ecosystems & Environment, 183:138–144.

Rogers, E. 1995. Diffusion of Innovations (4th edition). New York: The Free Press.

Röling, N. 1988. Extension Science: Information systems in agricultural development. Cambridge, UK: Cambridge University Press.

Röling, N. 1996. Toward an interactive agricultural science. Journal of Agricultural Education and Extension, 2(4), 35-47.

Röling, N. and Jiggins, J. 1997. The ecological knowledge system. Röling, N and Wagemakers, M.A. (Eds). Facilitating sustainable agriculture. Cambridge, UK: Cambridge University Press.

Rollett, A., Haines-Young, R., Potschin, M., and Kumar, P. 2008. Delivering environmental services through agri-environment programmes: a scoping study. LUPG agencies and Centre for Environmental Management, University of Nottingham, Nottingham.

Sala, P. 2012. Regional and local participation and co-operation in implementing the European Landscape Convention – the experience of the Landscape Observatory of Catalonia. In Raasakka, N and Sivonen, S. (Eds). Northern Landscapes ''Implementation of the European Landscape Convention in the North Calotte Area Municipalities'' - Conference in Inari, Finland 7-9th of September.2011. Report 48. Centre for Economic Development, Transport and the Environment for Lapland

Salas, M. 2013. Visualising Food Sovereignty in the Andes. Voices and flavours of the earth. Reclaiming Diversity and Citizenship Series. London: IIED.

Sainte Marie, C. de. 2014. Rethinking agri-environmental schemes. A result-oriented approach to the management of species-rich grasslands in France, Journal of Environmental Planning and Management, 57:5, 704-719.

Santucci, F. M. 2005. Strategic communication for rural development. New York: The World Bank.

Saywell, D and Cotton, A.P. 1999. Spreading the word: Practical guidelines for research dissemination. WEDC: Loughborough University.

Schrijver, R. and Uetake, T. 2015. Public goods and externalities: Agri-environmental Policy Measures in the Netherlands. OECD Food, Agriculture and Fisheries Papers, No. 82, OECD Publishing, Paris.

Schultz, L., Folke, C., and Olsson, P. 2007. Enhancing ecosystem management through social-ecological inventories: lessons from Kristianstads Vattenrike, Sweden. Environmental Conservation 34:140-152.

Senecah, S. 2001. The trinity of voice, legitimacy, and influence: The role of practical theory in evaluating and planning for the effectiveness of environmental participatory processes. Paper presented at the 6th Biennial Conference on Communication and Environment, University of Cincinnati, USA, 27-31st of July 2001.

Senecah, S. 2004. The trinity of voice, legitimacy, and influence: The role of practical theory in evaluating and planning for the effectiveness of environmental participatory processes. Depoe, S., Delicath, J., and Aepli, M-F. (Eds.). Communication and Public Participation in Environmental Decision Making. SUNY Press, chapter 1.

Sergi, G. 2012. Multi-level Governance and Administrative Capacity in Europe's Regional Policy: A Case Study on the LEADER Initiative in the Mezzogiorno Region of Puglia. Copenhagen Business School.

Soboh, R.A.M.E, Lansink, A.O., Giesen, G. and van Dijk, G. 2009. Performance measurement of Agricultural Marketing Cooperatives: The gap between theory and practice. Review of Agricultural Economics, 31 (3), 446-469.

Somers, N. 1998. Learning about sustainable agriculture: the case of Dutch arable farmers. Röling, N and Wagemakers, M.A. (Eds). Facilitating sustainable agriculture. Cambridge, UK: Cambridge University Press, chapter 7.

Sonnino, R. 2010. Escaping the local trap: insights on re-localization from school food reform. Journal of Environmental Policy & Planning 12(1): 23-40.

Süß, P., Gehrlein, U., and Dehmuth, S. 2011. Abschlussevaluation des PLENUM-Programms im Projektgebiet Allgäu-Oberschwaben. Institut für Ländliche Strukturforschung, Johann Wolfgang Goethe-Universität, Frankfurt/Main

Sutherland, L-A. (Ed.). 2014. Farming Transitions: Pathways Towards Regional Sustainability of Agriculture in Europe. Final Project Report from FarmPath. KBBE.2012.1.4-03.

Sutherland, L-A., Zagata, L. and Wilson, G.A. 2014. Conclusions. Sutherland, L-A., Darnhofer, I., Wilson, G., and Zagata, L. (Eds.): Transition pathways towards sustainability in agriculture: case studies from Europe, CABI Publishers.

Svensson, L et al. 2002. Interaktiv forskning – för utveckling i teori och praktik. Arbetsliv i omvandling 2002:7. Stockholm: Arbetslivsinstitutet

Termeer, C., Stuiver, M., Gerritsen, A., and Huntjens, P. 2013. Integrating Self-Governance in Heavily Regulated Policy Fields: Insights from a Dutch Farmers' Cooperative. Journal of Environmental Policy and Planning, 15:2, 285-302.

Tschakert, P., and Dietrich, K.A. 2010. Anticipatory learning for climate change adaptation and resilience. Ecology and Society, 15(2), 11.

Uphoff, N. 2001. Institutional change and policy reforms. Uphoff, N. (Ed.) Agroecological Innovations: Increasing Food Production with Participatory Development. London: Earthscan, pp. 251-260.

van Bommel, S., Röling, N., Aarts, N., and Turnhout, E. 2009. Social Learning for Solving Complex Problems: a Promising Solution or Wishful Thinking? A Case Study of Multi-Actor Negotiation for the Integrated Management and Sustainable Use of the Drentsche Aa Area in the Netherlands. Environmental Policy and Governance, 19, 400–412.

van Woerkum, C. 2000. Interactive policy-making: The principles. Journal of Agricultural Education and Extension, 6:4, pp 199-212.

Vella, J. 1994. Learning to listen: Learning to teach. San Francisco, CA: Jossey-Bass

von Haaren C, Warren-Kretzschmar B, Milos C, and Werthmann C. 2014. Opportunities for design approaches in landscape planning. Landscape and Urban Planning, 130:159–170

Walker, G., and Daniels, S. 2004. Dialogue and deliberation in environmental conflict: Enacting civic science. Environmental Communication Yearbook, 1:7, 145-163. Taylor & Francis.

Walker, G., Daniels, S., and Cheng, A. 2006. Facilitating dialogue and deliberation in environmental conflict: The use of groups in collaborative learning. Frey, L. R. (Ed.), Facilitating group communication: Innovations and applications with natural groups: Vol. 1. Facilitating group creation, conflict, and conversation. Cresskill, NJ: Hampton Press, pp. 205–238.

Wals, A. E. (Ed.). 2007. Social learning towards a sustainable world: Principles, perspectives, and praxis. Wageningen Academic Pub.

Webler, T. 1999. The craft and theory of public participation: a dialectical process. Journal of Risk Research, 2, 55–71.

Wigboldus, S and Leeuwis, C. 2013 Towards responsible scaling up and out in agricultural development. An exploration of concepts and principles. Centre of Development Innovation, Wageningen University.

William, R. 2000. Whole systems inquiry: Watersheds as integral systems for systemic learning and action. Cerf, M et al (Eds.). Cow up a tree: Knowing and learning processes for change in industrialised agriculture. Paris: INRA-SAD.

Wilson, K and Morren, G. 1990. Systems approaches for improvements in agriculture and resource management. New York: MacMillan.

Wilson, P., Lewis, M., and Ackroyd, J. 2014. Farm Business Innovation, Cooperation and Performance. Rural Business Research.

Winter, S. C. and May, P. J. 2001. Motivation for Compliance with Environmental Regulations. Journal of Policy Analysis and Management 20(4): 675-698.

Wondolleck, J and Yaffee, S. 2000. Making collaboration work: Lessons from innovation in natural resource management. Washington, DC: Island Press.

Woodhill, J. 2002. Sustainability, social learning and the democratic imperative. Lessons from the Australian landcare movement. Leeuwis, C. and R. Pyburn (Eds.), Wheelbarrows full of frogs – Social learning in rural resource management, pp. 317–331. Assen: Koninklijke Van Gorcum BV.

Woodhill, J. 2004. Facilitating Complex Multi-Stakeholder Processes A Social Learning Perspective. A working document. Manuscript.

Woodhill, J. 2012. Questions of scale. Understanding inclusive business in agri-food markets. Working document for the Seas of Change Workshop. Centre for Development Innovation, Wageningen UR.

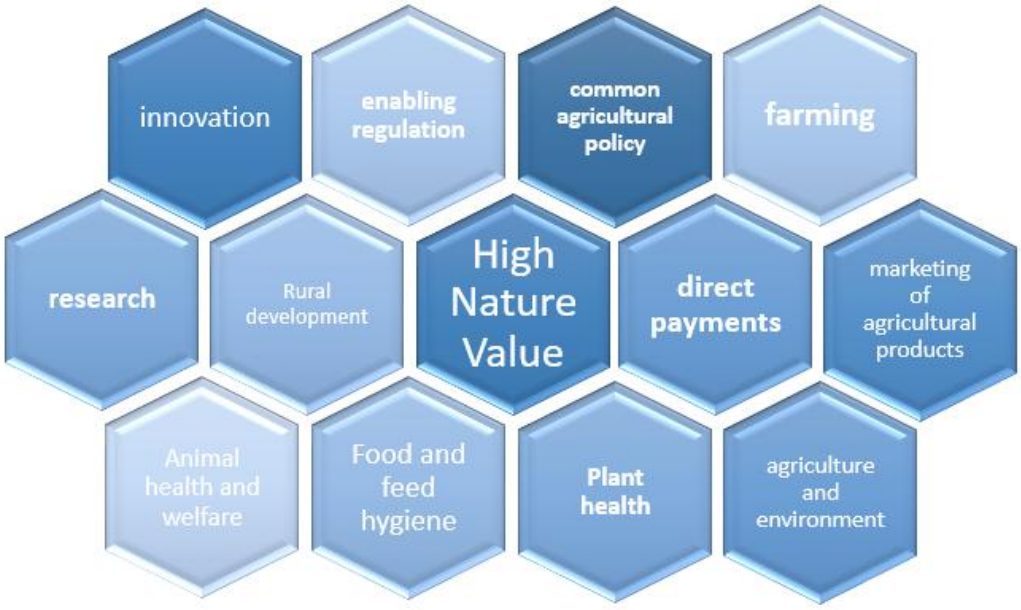
Wyborn, C., and Bixler, R P. 2013. Collaboration and nested environmental governance: Scale dependency, scale framing, and cross-scale interactions in collaborative conservation. Journal of Environmental Management 123 (2013) 58-67.

Wynn, G., Crabtree, B., and Potts, J., 2001. Modelling farmer entry into the environmen-tally sensitive area schemes in Scotland. Journal of Agricultural Economics, 52 (1), 65–82.

ZSI. 2008. Impulse für die gesellschaftliche Entwicklung. Zentrum für Soziale Innovation/Centre for Social Innovation, ZSI-Discussion Paper 9, Vienna.

INNOVATIONS BENEFITING HNV FARMING SYSTEMS, FARMERS AND COMMUNITIES

3 REGULATORY FRAMEWORK INNOVATIONS



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3. REGULATORY FRAMEWORK INNOVATIONS

3.1. Framing of the theme

The HNV-Link project regards Regulatory Framework innovation as the interpretation and implementation of existing policy frameworks to the benefit of HNV farming systems. The focus areas (sub-themes) and key words of the Regulatory Framework innovation review are based on the project description and the experts experience in the theme. They were reviewed and discussed during several meetings by all participants in the review process (EFNCP; STEP; UASVM Cluj-Napoca; University of Volos; ICAAM/UEvora; SLU; IT Sligo).

The main sub-themes of the Policy Framework literature review are:

1) Direct payments
2) Marketing of agricultural products
3) Rural development
4) Food and feed hygiene
5) Animal health and welfare
6) Plant health
7) Agriculture and environment
8) Research and innovation

3.2. Particular features of the literature review methodology

A detailed procedure for the research under this theme was developed (presented in Annex 1 to this document) and followed strictly by the project partners working on it. Since the main interest of the Regulatory Framework theme was how regulations influences HNV farmland innovations, current regulations, guidance documents and implementation reports from official European Union sources were examined. The words “high nature value”, “extensive farm*” and “marginal farm*” were searched in conjunction with the words listed below. The publications sections of a number of relevant institutions were also examined for relevant documents.

Table 3.1. Search terms, search engines and organisations publications pages examined in the course of this review.

Direct payments”
“greening”
“cross compliance”
“integrated administration and control system”
“Common Market Organisation”

"International Trade"		
"Certification Schemes"		
"Geographical Indication"		
"diversification*"		
"Label*"		
"Rural Development Regulation*"		
"Organic Farming Regulation*"		
"food hygiene"		
"chemical residue*"		
"Pesticide regulation*"		
"Animal feed regulation*"		
"chemical regulation*"		
"animal disease regulation*"		
"animal welfare regulation*"		
"animal identification"		
"genetically modifies organism*"		
"plant health"		
"biosecurity regulation*"		
"climate*"	and	"regulation*"
"biodiversity"	and	"regulation*"
"water"	and	"regulation*"
"landscape"	and	"regulation*"
"soil*"	and	"regulation*"
"EU policy"		

3.3 Summary of main results of the literature review for this theme

The literature review performed by the Regulatory Framework team resulted in a total of 135 documents being listed in the database. We produced a list of potentially relevant literature, a broad and detailed overview of the current policy framework, and a literature summary document. In terms of HNV farming systems, most of the publications in the theme are related to HNV systems broadly with little distinction among different HNVf systems though there are publications on specific farming systems e.g. Mediterranean and mountain regions (Beaufoy and Poux, 2013), olive oil production (Beaufoy and Pienkowski, 2000), and permanent pastures (Stefanova & Kazakova, 2015; Lepmets, 2015; Gallagher et al, 2015). This finding is not surprising given that regulatory framework decisions are made at an EU level and then interpreted at a national or regional level for implementation. HNVf has become more widely recognised in a policy context over the last 15 years and so there are a number of reports available that consider HNVf specifically. A large proportion of the literature discusses strengthening Pillar I payments links to higher minimum environmental standards (e.g. Peeters, 2012; Hart et al, 2011; Jack, 2012; Fry et al, 2011; Poux et al, 2006 , Keenleyside et al, 2014 etc) or highlights Pillar II options for supporting HNV farmland (Peeters, 2012; Hart et al, 2011, Sutcliffe et al, 2015; Darnhofer and Schneeberger, 2011). We found very little discussing other policy areas that may impact on HNV farmland though there were a number of publications on farming systems that occur primarily on HNVf (Kristensen, & Thamsborg, 2001; Pinna et al 2006)

Some statistics about the review process in the Policy Framework theme

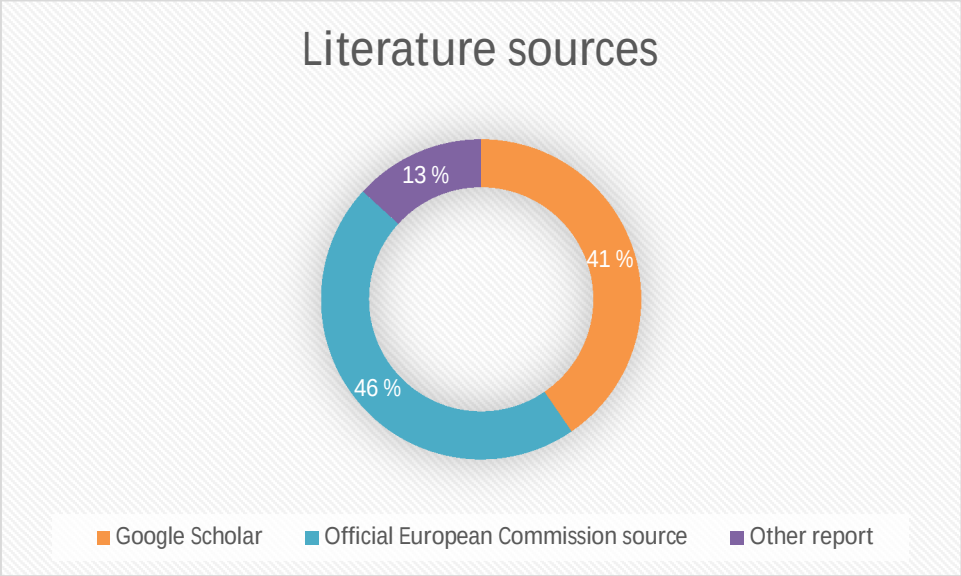

Figure 3.1. Compilation of the main sources of information for the policy framework review

First findings/ impressions from the literature review on Regulatory Framework innovations:

1. Few of the reviewed publications actually discuss current policy impacts on HNV farmland. Much of the research available investigates potential scenarios with very little analyses of existing policy measures on different farming systems.

2. There is a significant amount of literature that provides a commentary on what changes should be made to existing policy to improve it with a high proportion of this type of literature coming out in the run up to new CAP cycles.

3. Similar to the experience of the other research teams, in many of the publications, where we had a search match between "HNV farm*" and regulatory framework key words, we found a lot of "wishful thinking", for example "in order to preserve this HNV system, it would be good to link more tangible environmental outcomes to Pillar I payments"

4. There is wealth of literature that discusses the impacts of Pillar I direct payments and Pillar II rural development policy, along with suggestions on how they may be improved. The recommendation to strengthen the Pillar I payments links with the delivery of environmental public goods for agriculture in general is very prevalent. The call for more targeted Pillar II payments that deliver for HNVf in particular is also prevalent. There is a paucity of publications on how other regulations affect HNV farming but where they do exist they refer to marketing in particular and occasionally to animal identification and health.

OECD (no date) states that regulatory reform brings benefits in terms of reducing costs, enhancing efficiency and stimulating innovation and must be implemented without jeopardising the original objectives whether they be ensuring fair markets, environment protection or maintenance of

government oversight of private sector activities. The main problem in the review of the agriculture regulatory framework in relation to innovation and HNV farmland is that HNV farmland is a peripheral issue in the CAP reform process (with the exception of inclusion within EU Rural Development Policy priorities where there are also many other competing priorities). As such it is lost in the wider reform process. As a result, in the LA assessment of the regulatory framework and HNV innovations we will very much have to get LA co-ordinators to concentrate on describing the regulatory framework as implemented in their area, under the 8 themes identified and assess if this stimulates innovations (in the other 3 innovation themes-markets, social and institutional, techniques) in HNV farming which will improve their economic viability while maintain their environmental services.

3.4 Examples of existing innovations

SUB-THEME: DIRECT PAYMENTS

Short description of the innovation:	Interpreting Article 68 to enable a results-based scheme in the Burren, Ireland
Related themes/concepts/key words:	Policy innovation, Article 68, Agri-environment Scheme

Examples of innovative use of direct payments:

HNV system concerned:	*Permanent pasture*
What is the innovation:	Having results-based Agri-Environment Scheme payments covered under Article 68 of Pillar I.
What stage of the process is it in: *beginning <-> full development*	Full development, although continuation of the scheme is no longer eligible under article 68 and is now covered under article 35 of Pillar II.

Who initiated and who joined/followed? This was initiated by a number of key actors in the region including farm organisation members, governmental departments including Agriculture and National Parks and Wildlife Services staff and research

Identified enabling conditions or success factors The drive of the local actors and their facilitation by national governmental departments were key to the success of this innovation

Identified gaps and/or limiting factors The inability to cater for the continuation of a successful programme within the same article that was initiated under is a problem

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

This had a positive impact on extensive semi-natural grassland pastures in the region. It also had several knock-on effects. It instilled a sense of pride in farmers farming these HNVf pastures. This

encouraged them to take ownership of the environmental public goods they were producing raising community spirits and leading to other innovations relating to tourism and education.

SUB-THEME: MARKETING OF AGRICULTURAL PRODUCTS

Short description of the innovation:	PGI's and PDO's
Related themes/concepts/key words:	

Examples of innovative use of marketing of agricultural products:

HNV system concerned:	Potentially all HNV farming systems
What is the innovation:	Farming groups recognising the value of their product, coming together and gaining recognition for it, is innovative in itself for each group that does this
What stage of the process is it in:	Full development

Who initiated and who joined/followed? There are several examples of PGI's and PDO's across Europe. Several of these are in HNVf areas. In Ireland, Connemara Hill Lamb is one.

Identified enabling conditions or success factors The existing policy framework enables farming groups in HNVf areas to pursue this option if it is open to them.

Identified gaps and/or limiting factors There needs to be champions within the group who are aware of this option and who can motivate others to pursue it.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Where a premium can be applied to a product based on the HNVf system it is produced by then there is a desire to maintain and improve the HNVf system that is responsible for this premium. This is occurring on small scale in other HNVf areas in Ireland such as Achill Lamb and Comeragh Lamb. There is also a suggestion of utilising HNVf as a marketing tool in several other areas in Europe (Herzog et al, 2012; Kazakova & Stefanova, 2011)

SUB-THEME: RURAL DEVELOPMENT

Short description of the innovation:	Results-based agri-environment schemes (see examples from http://ec.europa.eu/environment/nature/rbaps/index_en.htm)

Examples of innovative use of rural development:

HNV system concerned:	Potentially all HNV farming systems
What is the innovation:	Direct payments based on tangible and measured outcomes as opposed to management/action based measures
What stage of the process is it in:	Full development

Who initiated and who joined/followed? Burren Farming for Conservation Programme (BFCP) following on from a LIFE funded project. This has since been followed by several programmes e.g. Spain and Sweden

Identified enabling conditions or success factors Success factors for RBAPS outlined on page 37 of EU Guidance see http://ec.europa.eu/environment/nature/rbaps/handbook/docs/rbaps-handbook.pdf

Identified gaps and/or limiting factors Gaining widespread support; government, local farming communities etc.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Sensitive management of Annex I grasslands has resulted in a measurable improvement in habitat condition managed by farmers in the scheme

SUB-THEME: RESEARCH AND INNOVATION

Short description of the innovation:	European Innovation Partnerships Focus Group
Related themes/concepts/key words:	HNVf

Examples of innovative use of research and innovation:

HNV system concerned:	Potentially all HNV farming systems
What is the innovation:	Putting funding in place to assess the needs of HNVf systems and consequently funding research into existing HNVf innovations through H2020
What stage of the process is it in:	Start of innovation process

beginning <-> full development

3.5 Key findings from the review on Policy Framework innovations

Summary of regulatory framework [1]

[1] A more detailed overview of regulatory framework is also available to guide the LA co-ordinators if required

There are a total of 2755 legislative agreements, directives, regulations and decisions currently in force specifically related to agriculture (EUR-lex 2016). A comprehensive review of the agriculture policy and regulatory framework is beyond the scope of this review but a useful overview can be obtained at https://ec.europa.eu/info/food-farming_en. This is an overview of the agriculture regulatory framework of relevance to High Nature Value (HNV) farmland. It is not a comprehensive review but rather a summary of the regulations that impact on farming activities (primary production and direct marketing by producers) on HNV farmland. The starting point for the overview was the was the DG Agriculture and Rural Development website and associated links. This led to the breakdown of the HNV related regulatory framework into 8 broad themes listed above in section 2.1. The regulatory framework deals mainly with the CAP Pillar 1 (direct payments and markets) and II (rural development) supports and various regulations that are linked to CAP through cross compliance requirements related to environment, plant health and animal health. Another important aspect in the context of HNV LINK are the supports available to stimulate research and innovation across the EU.

Direct payments currently in operation are divided into:

- Compulsory Schemes (operated by all MS): Basic Payment (or Single Area Payment); Greening Payment; Young Farmers Scheme; and
- Voluntary schemes (MS can choose): Redistributive payment; Support in areas with natural constraints; Coupled support; small farmers scheme

Greening (maintain permanent grassland, crop diversification and maintain ecological focus areas) and cross compliance requirements are part of pillar I supports. Cross compliance refers to certain rules that farmers in receipt of direct payments are required to adhere to. These rules refer to food safety, animal health, plant health, climate, environment, animal welfare and the maintenance of the condition of farmland.

There is also a range of sector specific supports dealing with market intervention, supply control measures (e.g. vine plant rights in wine sector) and producer organisation.

Marketing of agricultural products is governed by standards, certification schemes. EU agricultural product quality policy and labelling regulations. Quality schemes are backed by marketing standards (CEC, 2007). These lay down product definitions and categories, minimum characteristics and labelling requirements to be respected on the EU single market (European_Commission 2016a, European_Commission 2016b).

The EU Rural Development Policy (CAP Pillar II) aims to complements pillar 1 and is designed to meet a wide range of economic, environmental and social challenges in rural areas. It is implemented via 118 Rural Development Programmes (RDPs) across the 28 member states. The six EU priorities for rural development are:

- fostering knowledge transfer and innovation in agriculture, forestry and rural areas
- enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management
- promoting food chain organisation, animal welfare and risk management in agriculture
- restoring, preserving and enhancing ecosystems related to agriculture and forestry
- promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors

- promoting social inclusion, poverty reduction and economic development in rural areas

While not limiting measures, key articles under Regulation No 1305/2013 which enable measures to be designed to support the sustainable management of HNVf under MS RDPS include:

- Article 8 Thematic sub-programmes
- Article 14 Knowledge transfer and information actions
- Article 15 Advisory services, farm management and farm relief services
- Article 17 Investments in physical assets
- Article 19 Farm and business development
- Article 27 Setting up of producer groups
- Article 28 Agri-environment – climate
- Article 29 Organic Farming
- Article 30 Natura 2000 and Water Framework Directive payments
- Article 31-32 Payments to areas facing natural or other specific constraints
- Article 35 Co-operation
- Article 42–44 LEADER
- Article 55-57 EIP for Agricultural Productivity and Sustainability

Need to investigate in each LA if there are any innovative measures of relevance to HNV farmland designed and implemented under these various articles.

There is an EU legal framework in place to increase food safety. The framework includes a co-ordinated approach to food hygiene; monitoring programme for zoonotic agents throughout food chain; control programmes for salmonella and other food borne zoonotic diseases; microbiological criteria for assessment of safety and quality of foodstuffs; and harmonisation of measures for control of Transmissible Spongiform Encephalopathies. Imported food needs to comply with same standards. (European_Commission 2016c). Rules on food hygiene are contained within EC Regulations No. 852/2004, 853/2004 and 854/2004. A Commission report from 2009 contains details of experiences and difficulties encountered in MS with implementation (see http://ec.europa.eu/food/safety/docs/biosafety-hygiene-staff_working_doc_part1_en.pdf). There is flexibility in rules in relation to certain establishments such as micro enterprises and this needs to be investigated to see how this is dealt with at LA leveland specifically if there is evidence of specific HNV innovations in this area.

In March 2016 the EU adopted the EU "Animal Health Law" (EU Regulation No 429/2016. It covers the principle rules on requirements for disease prevention and preparedness; disease awareness; biosecurity; traceability of animals and where necessary products thereof; intra-EU movements and entry into the EU of animals and animal products; surveillance; disease control and eradication; and emergency measures. It does not cover rules on animal welfare but specifically recognises the link between health and welfare and requires animal welfare to be taken into account when considering impacts and measures on animal disease prevention and control. EU rules on the identification of animals are aimed at locating and tracing animals for veterinary purposes; the traceability of meat for animal and public health reasons and the management of livestock premiums. A range of systems of identification and registration of animals dependent on the needs of different species and include visual or electronic identifiers, registers or passports. There are a number of derogations and specific measures of relevance to HNV farming systems and this needs to be investigated to see how this is implemented at LA level and any specific HNV innovations.

In relation to plant health and biosecurity the EU regulates the introduction of plants and plant products into the EU; regulates the movement of plants and plant products within the EU; imposes eradication and containment measures in case of outbreaks, and co-finances them and places obligations on countries outside the EU which want to export plants or plant products to the EU.

The overall environmental objective of CAP is to promote sustainable management of natural resources and climate action, with a focus on greenhouse gas emissions, biodiversity, soil and water (EU Reg No 1306 article 110). CAP aims to integrate environmental concerns across both Pillar I and II. In Pillar I, there are mandatory greening measures and cross compliance measures related to the environment to ensure statutory requirements are adhered to and basic Good Agricultural and Environmental Condition (GAEC) of land are met. Under Pillar II there are a number of targeted aid measures to promote environmentally sustainable farming practices such as agri-environment schemes and Natura 2000 payments. Key elements of the environment regulatory framework include the 2020 climate and energy package which sets key targets for reduction in greenhouse gas emissions; the EU Biodiversity Strategy; Birds and Habitats Directives; and the Water Framework Directive. Implementation of these at LA level need to be investigated to see how their implementation impacts on HNV farmland and any specific HNV innovations that are arising-e.g. innovation process instigated through LIFE programmes; Innovative measures in river basin district management plans etc.

The importance of research and innovation to the agricultural sector from a growth and development point of view has been acknowledged by the European Commission (European_Commission 2011). Research is an integral part of the Agricultural Knowledge and Innovation System (AKIS). While the European Commission want to ensure that research activities respond to on-the-ground needs and that results are taken up by farmers and foresters. This has prompted the EU to bring science and practice closer together with a view to having a more demand-driven research policy and a more evidence-based agricultural policy. (European_Commission, 2016k). CAP itself does not fund research but the EU Framework Programme for Research and Innovation has specific themes that cater for agriculture through the Horizon 2020 societal challenge 2 which covers the Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy theme (European_Commission, 2016j). A Europe 2020 initiative put forward European Innovation Partnerships as a new approach to EU research and innovation. EIPs are challenge-driven, focusing on societal benefits and a rapid modernisation of the associated sectors and markets (European_Commission, 2016l). Need to investigate in LAs are there any specific opportunities for EIP operational groups; ongoing research projects on HNV; innovative delivery of AKIS etc.

Success factors

Broadly speaking, the ability to see an opportunity within the regulatory framework that can be exploited, key actors in place, and flexibility in the way the MS implements the policy
In the Burren LA case there were a number of success factors.

- Availability of scientific data backing up observations
- Availability of funding to pursue a pilot project in the area
- Presence of people who strongly supported this course of action, i.e. scientists, government agencies including AKIS, farmers
- Ability to fit pilot study expansion under article 68 of CAP
- Political will to continue supporting the programme

Limiting factors

A snapshot of the barriers and limitations to policy framework innovations:

- The specific implementation of EU regulations requires decisions at the national administration level and this can sometimes be a barrier for HNVf supports. For example, interpretation of the same regulation results in all land being eligible for support in Spain while in Bulgaria a million hectares are excluded (Kazakova & Stefanova, 2011)
- Conversion to organic production could be an option for many small ruminant farmers with extensive farming practices. The main barriers to increased organic product sales are confusion and mistrust in relation to standards and labelling systems, high prices and low product quality and poor product availability and visibility (Kristensen & Thamsborg, 2001)
- A case study from Extremadura highlights specific CAP barriers to HNVf- approximately 86 % of annual EAGGF expenditure is on the Pillar 1 regimes. SPS is paid on a historic basis and payments are weighted heavily in favour of more intensive farming systems. Most of Pillar 2 expenditure in the 2000–2006 period was allocated to measures such as farm modernisation, irrigation and afforestation that do not benefit HNV farming and often work against it (Beaufoy et al, 2009).
- Common barriers to effective operation of policies include a lack of consideration for the perceptions and understandings of targeted or intended beneficiary groups; implementation processes designed primarily to simplify payment, control and audit processes rather than to achieve successful outcomes; and lack of trust in local delivery agents and among beneficiary groups. Risk aversion and insufficient understanding of local factors influencing policy performance too often characterise the design and administration of RD funding. Poor quality AKIS impacts on innovation delivery (Dwyer et al, 2012).

Recommendations from the literature

- Kazakova & Stefanova (2011) recommend two key aspects of market related activities that could be developed to bring public recognition for HNV farming 1) Monetarization of ecosystem services and the direct and indirect benefits to people and nature and 2) Promotion and marketing of food and other products from HNV farming systems, including, if necessary, a “HNV farming” label. There are also suggestions on how to improve policy implementation in these countries through knowledge and capacity building at local and regional level to aid proper utilization of available national and EU funding; completion of Land Parcel Identification System (LPIS) and Integrated Administration and Control System (IACS) would improve things greatly; and improved coordination, communication and cooperation at all levels. This would apply to more than just SEE countries.
- Many of the publications recommend incentivising public good provision more through both Pillars of the CAP (Smaje and Rowlatt, 2011; Baldock et al, 2010; Hart et al, 2011; Peeters, 2001)
- Dwyer et al (2012) make 12 recommendations including that the EC ensures that all Member States spend a minimum proportion of their total EU CAP allocations on rural development under the EAFRD, in recognition of its specific better balance in overall resource allocations.

This proportion could be set initially at 20% or 25%, to be reviewed at mid-term. It is clearly stated that the new Pillar 2 regulation could be undermined by the continuing rigidity of CAP financial regulations governing the EAFRD, which are inconsistent with those applied to other EU funds serving similar development purposes (ERDF, ESF, EMFF). It is also recommended that the Commission should add a provision which specifically incentivises risk-taking in innovative actions within RDPs (not just within EIP), and prevents the 'performance reserve' mechanism from disincentivising innovation.

Where/in which dimension can more innovation be found in HNV systems based on the literature review? What gaps in research did we detect?

Much of the literature suggests making Pillar I payments more specifically linked to the delivery of environmental public good and ecosystem services. This would benefit HNVf farms since they are already producing these goods and services with little or no recognition for it. There is also a lot of good discussion within the literature of utilising Pillar II more effectively to benefit HNVf. Many of the suggestions are not very tangible but a move toward results-based agri-environmental schemes is mentioned a number of times.

Utilising the AKIS is also something that is mentioned and it is clear that where the AKIS is HNVf specific it could deliver a lot of innovations for HNVf particularly where there is joined up thinking between AKIS and LAGs where possible. The fact that this is not possible in every Member State brings up the need for the policy to be more flexible and for MS implementation of the policy to be cognisant of the potential that could be unlocked where LAGs can be involved in agricultural initiatives.

Aside from Pillar I and Pillar II there are a number of other policy areas that could be more cognisant of HNVf. Existing frameworks, though designed to ensure high quality, safe food for the consumers can be very onerous on more extensive farming systems and therefore a barrier to innovating in relation to animal feeds, animal health, animal identification, conversion to organic farming, marketing etc. That is not to say that there are not opportunities to innovate in these areas.

3.6 Recommendations to the Learning Areas for the identification and description of regulatory framework innovations

The description of the HNV innovations in the LAs should follow the template provided to ensure coherence and comparability between them. The recommendations provided in this section reflect the findings of the literature review and aim to assist the LA coordinators in describing the regulatory framework under the Baseline Assessment in WP1 and the HNV innovation assessment in WP2. They should be treated as having an orientation and guidance function as opposed to a step-by-step instructive role. As a starting point we recommend reading the following:

Dwyer, J., Ilbery, B., Kubinakova, K., Buckwell, A., Menadue, H., Hart, K., ... & Erjavec, E. (2012). How to improve the sustainable competitiveness and innovation of the EU agricultural sector. *Brussel: European Parliament*

Beaufoy, G., Calvo, E.C., Hoogeveen, Y., Petersen, J.E., 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. European Environment Agency.

Kazakova, Y., Stefanova, V., 2011. High Nature Value Farming in South-Eastern Europe: Policy Opportunities and Challenges in the EU Accession. European Forum on Nature Conservation and Pastoralism.

Keenleyside, C., et al. (2014). "The High Nature Value farming concept throughout EU 27 and its maturity for financial support under the CAP." Institute for European Environmental Policy.

These reports contain well written explanations of innovation in agriculture or consider policy in relation to HNVf very well. There are also a number of good case studies of policy implementation in specific countries or regions that consider the advantages or disadvantages of such policies for HNVf. These will be useful guides for the LAs.

Defining HNV innovations in regulatory framework at LA level

An overview of the HNV Regulatory Framework at EU level is available which can be used as a guide for LA co-ordinators for the regulatory framework innovation assessments. Within this overview document there are links to various country reports and MS specific information that can be used during this Baseline Assessment. The regulatory framework should be described under 8 sub themes i.e. Direct payments; Marketing of agricultural products; Rural development; Food and feed hygiene; Animal health and welfare; Plant health; Agriculture and environment; Research and innovation. LA co-ordinators should also identify any challenges /issues/opportunities within the regulatory framework for HNV farmland.

In the innovation assessment, LA co-ordinators should focus on identifying if their authorities have utilised any flexibility within the policy framework to target supports/initiative at HNV areas. Some of these could be considered HNV Regulatory Framework Innovations or the beginning of the HNV innovation process. For example, has the MS used voluntary coupled support to combat land abandonment on HNV farmland; are there innovative measures targeted at HNV in your RDP; is there flexibility in implementation in rules in relation to food hygiene for micro-enterprises; are derogations to animal identification system utilised; are there relevant research and innovation projects in LA e.g. LIFE, INTERREG, H2020, other national funding.

Defining and describing the impact of the HNV regulatory framework innovations at LA level
The impacts of the regulatory framework at LA level on HNV innovations might be best described in summary form as a table. You should consider the regulatory framework and how it relates to HNV innovations across the three themes i.e. markets and products; farming techniques; social and institutional (Figure 2).

Figure 3.2. The regulatory framework should be considered under three main headings and the contribution made to HNVf innovations should be assessed as above

Then under the regulatory framework headings for your LA (that you described in your Baseline Assessment) you should assess along a 5 point scale (from active enabler to active barrier) how the regulatory framework of the LA is compatible with enabling an HNV innovation process within the LA (see Table 3.1 as example output). This exercise might be best undertaken as part of an expert group meeting/workshop in your learning area. All eight themes may not apply to each LA but it is important that each of those that do apply are listed.

Table 3.1. Output table that will result from the regulatory framework assessment.

Regulatory Framework Theme	Innovation Theme	Scale of compatibility
Direct payments	Markets and Products	Enabler Barrier 1 ⟷ 5
	Farming techniques	
	Social and Institutional	
Marketing of agricultural products	Markets and Products	
	Farming techniques	
	Social and Institutional	
Rural Development	Markets and Products	
	Farming techniques	
	Social and Institutional	
Food and feed hygiene	Markets and Products	

	Farming techniques
	Social and Institutional
	Markets and Products
Animal health and welfare	Farming techniques
	Social and Institutional
	Markets and Products
Plant health	Farming techniques
	Social and Institutional
	Markets and Products
Agriculture and environment	Farming techniques
	Social and Institutional
	Markets and Products
Research and innovation	Farming techniques
	Social and Institutional

3.7 Key policy documents and publications

Beaufoy, G., & Pienkowski, M. (2000). The environmental impact of olive oil production in the European Union: practical options for improving the environmental impact. *European Commission, Brussels*.

Beaufoy, G., Calvo, E.C., Hoogeveen, Y., Petersen, J.E., 2009. Distribution and targeting of the CAP budget from a biodiversity perspective. European Environment Agency.

Beaufoy, G. and X. Poux (2013). Supporting HNV extensive livestock systems in Mountain and Mediterranean areas–The need for an adapted European Policy, European Forum for Nature Conservation and Pastoralism.

CEC (2007). Council Regulation (EC) No 1234/2007 of 22 October 2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation), Council of the European Communities

CEC (2012). "The implementation of the Soil Thematic Strategy and ongoing activities " Official Journal of the European Union.

CEC (2013). Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities. Official Journal of the European Union. Brussels, Commission of the European Communities.

Darnhofer, I. and W. Schneeberger (2007). "Impacts of voluntary agri-environmental measures on Austria's agriculture." International journal of agricultural resources, governance and ecology 6(3): 360-377.

Dwyer, J., Ilbery, B., Kubinakova, K., Buckwell, A., Menadue, H., Hart, K., ... & Erjavec, E. (2012). How to improve the sustainable competitiveness and innovation of the EU agricultural sector. *Brussel: European Parliament*

European Commission (2011) Communication from the Commission of the European Parliament, The Council, The Economic and Social Committee and the Committee of the Regions.Our life insurance, our natural capital: an EU biodiversity strategy to 2020, Brussels: European Commission.European_Commission (2011). COMMISSION STAFF WORKING PAPER : IMPACT ASSESSMENT Common Agricultural Policy towards 2020 ANNEX 7 Brussels, European Commission.

European Commission (2013) 'Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 on establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009'.

European_Commission (2013b). Agricultural Policy Perspectives Brief; Overview of CAP Reform 2014-2020. Brussels, European Commission.

European_Commission (2013c). Agricultural Genetic Resources - from conservation to sustainable use Brussels, European Commission.

European Commission (2015a) 'Direct Aid Schemes', 4.

European Commission (2015b) Report to the Commission to the European Parliament and the Council. The Mid-Term Review of teh EU Biodiversity Strategy to 2020, Brussels: European Commission.

European_Commission (2015c). "EU agriculture and climate change." from http://ec.europa.eu/agriculture/climate-change/factsheet_en.pdf.

European Commission (2016a) Commission Staff Working Document. Review of Greening after one year, Brussels.

European Commission (2016b) 'Direct Payments- Basic Payment Scheme', [online], available: http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/basic-payment-scheme_en.pdf [accessed.

European Commission (2016c) 'The Small Farmers Scheme', 11.

European Parliament (2016) Mid-term review of the EU's Biodiversity Strategy. European Parliament resolution of 2 February 2016 on the mid-term review of the EU's Biodiversity Strategy (2015/2137(INI)).

EUR-lex (2016). "Directory of European Union legislation." Retrieved 17-08-2016, from http://eur-lex.europa.eu/browse/directories/legislation.html?root_default=CC_1_CODED%3D03&classification=in-force&displayProfile=allRelAllConsDocProfile&locale=en.

European_Commission (2016a). "Evaluation reports: Rural development." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/agriculture/evaluation/rural-development-reports/index_en.htm.

European_Commission (2016b). "Food information to consumers - legislation." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation/index_en.htm.

European_Commission (2016c). "Biological safety." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/food/safety/biosafety/index_en.htm.

European_Commission (2016d). "Plant health and biosecurity." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/food/plant/plant_health_biosecurity/index_en.htm.

European_Commission (2016e). "Studies and Reports on Agriculture." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/environment/agriculture/studies.htm.

European_Commission (2016f). "2050 low-carbon economy." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm.

European_Commission (2016g). "Effort Sharing Decision." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/effort/index_en.htm.

European_Commission (2016h). "LULUCF in the EU." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/forests/lulucf/documentation_en.htm.

European_Commission (2016i). "Soil." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/environment/soil/three_en.htm.

European_Commission (2016j). "Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy ". Retrieved 18-08-2016, 2016, from http://ec.europa.eu/programmes/horizon2020/en/h2020-section/food-security-sustainable-agriculture-and-forestry-marine-maritime-and-inland-water.

European_Commission (2016k). "Agricultural research and innovation." Retrieved 18-08-2016, 2016, from http://ec.europa.eu/agriculture/research-innovation/index_en.htm.

European_Commission (2016l). "European Innovation Partnerships ". Retrieved 18-08-2016, 2016, from http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip.

Fry, J., et al. (2011). "General Biodiversity Impact Assessment in Strategic Environmental Assessment: Addressing a neglected area." SEA Implementation and Practice: Making an Impact.

Gallagher, C., Maher, C. & Jones G. (2015) Country Report on the Implementation of the new CAP and its possible effects on permanent pastures: Ireland. European Forum for Nature Conservation and Pastoralism report

Hart, K., et al. (2011). What tools for the European agricultural policy to encourage the provision of public goods? Brussels, European Parliament.

Herzog, F., et al. (2012). Biodiversity Indicators for European Farming Systems. Zurich, Switzerland, Agroscope.

Jack, B. (2006). "The European Community and Biodiversity Loss: Missing the Target?" Review of European Community & International Environmental Law 15(3): 304-315.

Kazakova, Y., Stefanova, V., 2011. High Nature Value Farming in South-Eastern Europe: Policy Opportunities and Challenges in the EU Accession. European Forum on Nature Conservation and Pastoralism.

Keenleyside, C., et al. (2014). "The High Nature Value farming concept throughout EU 27 and its maturity for financial support under the CAP." Institute for European Environmental Policy.

Kristensen, E. S. and S. M. Thamsborg (2001). "Future European market for organic products from ruminants." PUBLICATION-EUROPEAN ASSOCIATION FOR ANIMAL PRODUCTION 106: 5-14.

Lepmets, E. (2015) Country Report on the Implementation of the new CAP and its possible effects on permanent pastures: Estonia. European Forum for Nature Conservation and Pastoralism report

OECD (n.d.). Regulatory Reform and Innovation. Organisation for Economic Co-operation and Development.

Peeters, A. (2012). Past and future of European grasslands. The challenge of the CAP towards 2020. Grassland—a European Resource. P. Goliński, M. Warda and M. Stypiński. Poznan, Poland, Polish Grassland Society. 17: 17-32.

Pinna, W., et al. (2006). "Electronic identification of Sarda goats under extensive conditions in the island of Sardinia." Small Ruminant Research 66(1–3): 286-290.

Poux, X., et al. (2006). Study on environmental consequences of Sheep and Goat farming and of the Sheep and Goat premium system, European Commission.

Stefanova, V. & Kazakova, Y. (2015) Country Report on the Implementation of the new CAP and its possible effects on permanent pastures: Bulgaria. European Forum for Nature Conservation and Pastoralism report

Sutcliffe, L., et al. (2015). "Combining approaches to support high nature value Farmland in southern Transylvania, Romania." Hacquetia 14(1): 53-63.

INNOVATIONS BENEFITING HNV FARMING SYSTEMS, FARMERS AND COMMUNITIES

4 MARKETS AND PRODUCTS

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3 MARKETS AND PRODUCTS

4.1 Framing of the theme

HNV-Link project regards Markets and Products innovation as a way to increase the productive and environmental efficiency of HNV farming systems. This puts emphasis on development of new products, product processing, adding value, and marketing of products from HNV farming systems and areas, which have the potential to monetise the environmental value of HNV products and increase their profitability.

The focus areas (sub-themes) and key words of the Markets and Products innovation review are based on the project description, the experts experience in the theme and the report of the EIP Agri Focus Group on HNV Farming Profitability. They were reviewed, discussed and validated during several meetings by all participants in the review process (EFNCP; STEP; UASVM Cluj-Napoca; University of Volos; ICAAM/UEvora; SLU; IT Sligo).

The main sub-themes of the Products and Markets literature review are thus:

1) Branding of products: quality or sustainability labels
   This includes EU quality policy labels: Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Specialties Guaranteed (TSG), Mountain Food Label.
2) Products certification
   This includes Organic certification, Voluntary certification schemes as well as Fair Trade.
3) Access to markets of HNV farmers
   This includes several sub-themes:
   a. Producers and/or marketing cooperatives;
   b. Short-supply chains such as farmers' markets, local markets, on-farm sales, Internet sales, local fairs, festivals and events; and
   c. Producers to consumer contracts (Community Supported Agriculture (CSA).
4) Diversification into innovative products, including on-farm processing, adding value to farming produce, profitability and sustainability.
5) "Green" or local food, including ethical and tasty food.
6) Innovations in packaging and advertising of HNV products.

4.2 Particular features of the literature review methodology

A detailed procedure for the research under this theme was developed and followed strictly by the project partners working on it. Since the main interest of the project are the HNV farming systems, each of the key words identified for the Products and Markets theme was combined with each of the four HNV farming systems of HNV arable systems, HNV livestock systems, HNV permanent crops, and HNV mixed and mosaic systems (Table 4.1).

Table 4.1. Search terms, search engines and organisations publications pages examined in the course of this review.

Key word	Filters	HNV arable systems	HNV livestock systems	HNV permanent crops	HNV mixed and mosaic systems
"product*"	and				
"Quality*"	"innovation*"				
"PDO" / "PGI"/ "TSG"	and				
"label*"					
"certification*"					
"local food*"					
"diversification*"					
"packaging*"					
"advertising*"					
"processing*"					
"adding value*"					
"profitability*"					
"sustainability*"					
"landscape*"					
"ecosystems*"					
"local habit*" or "local practice*"					
"local customs*"					
"extensibility*"					
"GI*"					
"guarantee*"					
"access*"	and				
"cooperatives*"	"market*"				
"community supported agriculture*"	and				
"farmers markets*"					
"fair trade*"					
"circuits court*"					
"ethical and tasty food*"					
"on-farm sales*"	and				
"internet sales*"	"short-supply*"				
"local fairs*"					
"festival*"	and				
"event*"					

These combinations resulted in a large number of publications and documents – eg. HNV arable and "innovation" and "product" produced 2450 results; and HNV livestock and "innovation" and "product" produced 252 results. In reality, a few of them were directly related to HNV systems and/or reported on innovations in HNV systems. When these search combinations were exhausted, and the team members still did not feel satisfied with the results, we used additional combinations such as:

"HNV food product*"	AND	"innovation",
"HNV product"	AND	"innovation"
"innovation*	AND	"local food markets"
"Local market"	AND	"innovation"
"short supply chain"	AND	"food"
"Ruminant production systems"	AND	"market*"
"Ruminant production systems"	AND	"innovation*" AND "ecosystems" AND "livestock"
"Livestock farming product"	AND	"innovation" and "market"
"systemes agri-food localised"	AND	"high nature value livestock" AND "innovation" AND
"PDO"		
"protected designation of origin livestock products"	AND	"Innovation"
"localized agrifood systems"	AND	"HNV livestock"
"dairy"	AND	"IG" AND "pastures"
"Product terroir"	AND	"market"
"livestock"	AND	"market"

4.3 Summary of main results of the literature review for this theme

The literature review performed by the Products and Markets team resulted in 224 documents enlisted in the database. The final number of publications short-listed as relevant to the Products and Markets theme is 144. Of them, 21 are from outside Europe and we considered them only if they made a comparison with the situation in Europe. Therefore, the final "short-list" of publications relevant to Markets and Products Innovations in HNV farming system is around 120.

The research procedure that we followed and the combinations of key words that we used, resulted in enlisting of more than 70 publications, which after our initial review were labelled as relevant to the Farming Techniques theme (50 papers), Social and Institutional (16 papers) and Regulatory Framework (6 papers). This is explained by the fact the innovations in the Markets and Products theme are usually linked to farming techniques and/or social andinstitutional and/or regulatory changes and there is a significant overlaps between these themes.

In terms of HNV farming systems, most of the "short-listed" publications in the theme are related to HNV livestock systems – 40% of all papers. This is of no surprise having in mind that they are the most distributed and well recognised HNV system. Relevance to Products and Markets in HNV arable systems is found in 25% of the papers; in the HNV permanent crops and mosaic systems, respectively 11% and 5%. Additionally, in 19% of the reviewed publications, no direct mention to HNV farming systems is found but they are considered potentially relevant to innovations in the Products and Market theme.

Figure 4.1. Number of results in different thematic areas – results obtained by the Product and Market team;

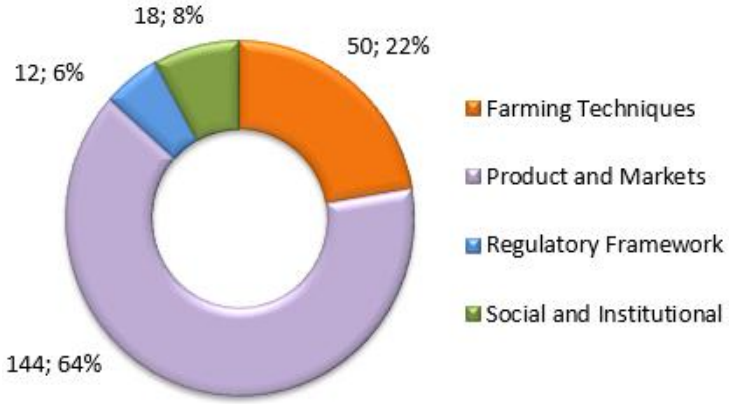
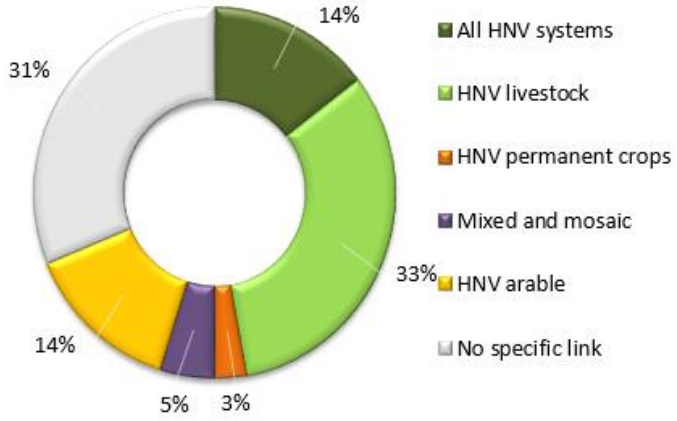


Figure 4.2. Share of papers reviewed in different HNV farming systems (only product and marketing)

Some papers relate to one or more HNV farming systems;



Summary of the findings from the literature review on Market and Product innovations:

- Very few of the reviewed publications actually discuss directly HNVf markets or products. In reality, most of the HNV markets/products experiences are from Bulgaria (Dzhabarova, Peneva, 2014, Peneva, Kazakova, 2015a,b) and Romania (Akeroyd, Page, 2011, Popa, 2010, 2015, Stanciu, 2012); some reference is made to the concept of HNV farming in the discussion of local food in the UK (Winter 2005). Based on this finding, our conclusion is that there is still a significant gap in the scientific research and publications that are specifically focused on Markets and Products Innovations in High Nature Value farming systems.

- In some publications, where we had a search match between "HNV farming systems" and market and products key words, we found what we call "wishful thinking", for example "in order to preserve this HNV system, it will be good to develop local markets and direct sales, to add value to products and to increase farmers' incomes…".

- The publications focused on market innovations or alternative markets such as short-food supply chains, farmers markets or community supported agriculture are significantly more (see Section 2.6 Bibliography), and describe both the theoretical background and case studies of actual implementation. They focus mostly on benefits to consumers and/or producers; while where environmental benefits are specified, they mostly refer to carbon emission savings. The potential benefits to HNV farming systems are not defined. This is another gap in the literature,

which potentially can be addressed after the identification and assessment of Markets and Products Innovations in the HNV Link ten learning areas.

- We observe a kind of clustering of studies/publications and countries on certain sub-themes in the Markets and Products Innovations that are potentially relevant to HNV farming systems: For example, many of the French publications are on PDO, and very little of them are on HNV farming. In Spain, there is a focus on pastoral livestock systems as well as PDO but again less on HNV. On the opposite, in Bulgaria and Romania, there is a focus on HNV farming and direct sales, but almost none on PDO.
  This is most likely a reflection of the embeddedness of the respective theme/sub-theme/concept at national level. There is also a historical aspect of the observed clustering, since the use of geographic indications, in France especially, precedes the official adoption of HNV farming concept at EU level; while in Bulgaria and Romania, the alternative marketing approaches are promoted by organisations also promoting HNV farming systems.
  Reflection point for the learning area (LA): It is important that the Baseline Assessment in WP1 describe the prevailing market approaches as well as the embeddedness of the HNV concept at national and LA levels.

- There is an overlap between the innovation themes – in the discussion of Markets and Products Innovation often the enabling conditions and/or factors that need to be improved (see Section 2.5 below) are related to social and institutional (social cohesion, cooperation between producers and consumers); regulatory (hygiene requirements, subsidies, etc.) and techniques (adaptability of techniques and equipment to small and medium-size producers.

4.4 Examples of existing innovations

SUB-THEME: FESTIVALS FOR DIRECT MARKETING OF LOCAL FOOD AND HNV PRODUCTS

Short description of the innovation:	Traditional festival as a marketing tool for local and HNV food products
Related themes/concepts/key words:	Direct sales, traditional food, local varieties, festival, on-line sales

Examples of innovative use of [festivals]:

HNV system concerned:	HNV mixed /mosaic systems
What is the innovation:	The festival combines cultural celebration and direct sales of local and HNV food products.
What stage of the process is it in:	In development, currently assessing the feasibility of registering PDO of Kurtovo konare peppers and tomatoes

The idea and focus of the first festival in 2009 was developed as a response to the need to enhance the local livelihoods closely related to small-scale production of vegetables, including the promotion of specific local varieties of peppers and tomatoes in the designated Bessaparski Hills Natura 2000 zone.

Who initiated and who joined/followed?

It was initiated by the local cultural house (chitalishte) in the village of Kurtovo konare together with local people and producers. The motivation and inspiration of local people has gained the support of a number of donors and supporting NGOs in the cultural, nature conservation and food domains. The Bulgarian Society for the Protection of Birds provided support to farmers via a mobile advisory team, which helped farmers to gain confidence and understanding of the nature conservation values of their practices and their surrounding environment. Slow Food Bulgaria recognised the global importance of the local pepper and tomato varieties by listing them in the Ark of Taste catalogue. They are also working with the producer group to assess the feasibility of registering a PDO.

Identified enabling conditions or success factors

The key success factor for this initiative is the motivation and decisiveness of the core team from the local cultural house who are convinced that there is future for the traditional food and crafts. Sometimes they "push" farmers to make another step, such as online sales; sometimes they provide service to farmers such as printing the first labels for the processed products.

Identified gaps and/or limiting factors

Change in the level of support from the municipal authorities, following the local elections. While the previous officers were very supportive and could see the benefit of this initiative, the current officer is pro-productivist and displays a negative attitude.

Benefits to HNV farming systems, farmers and communities:

The initiative contributes directly to preserving the local varieties of pepper and tomato. They cannot be produced intensively, which contributes to maintaining the mosaic character of the production systems in the Natura 2000 zone. Adding value to the local products by processing them into lyutenitsa (pepper-tomato spread) contributes to raising the income of small-scale producers.

Source: Yulia DZHABAROVA, Mariya PENEVA 2014, Direct Marketing for High Nature Value Products – The Bulgarian Approach IN Turkish Journal of Agricultural and Natural Sciences Special Issue: 2, 2014. 1784-1789, http://dergipark.ulakbim.gov.tr/ttdb/article/download/5000091059/5000084460

SUB-THEME: INNOVATIVE PRODUCTS TO SUPPORT HNV FARMING SYSTEMS (SHEPHERDING)

Short description of the innovation:	Experimentation with new forms of interaction to promote the integration of shepherding in the 21st century world in the Basque Country (Spain)
Related themes/concepts/key words:	New products; diversification; branding - trademark; advertising; adding value; festival.

Examples of innovative use of [innovative products]:

HNV system concerned:	HNV livestock systems - shepherding
What is the innovation:	A new management model, involving professionals from the sector; in combination with awareness-raising of the general

	public and experimentation with new products and interactions with the public.
What stage of the process is it in:	Developing, slowed down after initial high uptake due to personal circumstances with members of the core team

The innovation is in response to need to safeguard the future of shepherding in the 21st century. The objectives were specified in a programme of actions along three lines: new products, research and innovation and, finally, the Latxakluba supporters´ club. A series of new products was designed, related to shepherding and to the image of the latxa sheep aiming at (1) diversification of the production and (2) obtaining funds for the innovation project.

Who initiated and who joined/followed?

A group of professionals from the fields of farming, training, research and marketing got together. The design and testing of a new type of latxa sheep cheese with characteristics distinct from the wide-spread Idiazabal cheese, and to the development of new food products, such as creams, sweets, ice-creams, pickles were done in collaboration with the research department of the Gastronomic Sciences Faculty of Mondragon University and the Leartiker Institute for Food Research and Technology.

A programme of tourist visits to sheep farms included inter-active games, ancient shepherding techniques, sales at a dedicated shop in each farm as well as a micro-museum network.

A range of merchandising materials was made by local artisans and firms, including Latxiñe, the biggest sheep in the world onto which kids can climb. A great latxa sheep festival is organized with 28 different activities such as a market of shepherd´s products, famous chefs cooking shepherd menus, documentary and fiction films, conferences and roundtables, a think-tank was created, dance groups and choirs, a shepherd´s fashion show, etc.

Identified enabling conditions or success factors

The festival is a total success in terms of participation of the public. The progress achieved on both new products and research, made the public´s interest grow. It was economically self-sustainable thanks to all the Ardilatxa merchandising sales.

The positive conclusions drawn by the initiators of the innovation are:

- There is scope for innovation in shepherding and there is public interested in it, and these people are likely to be consumers at the same time.
- Innovating initiatives may stem from a small group of independent entrepreneurs.
- Innovation does not necessarily require a big budget.
- An innovating programme may be self-sustainable through the development of its own trademark.

Identified gaps and/or limiting factors

Personal circumstances of members of the core team slowed down the initiative's full implementation thereafter.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Shepherding, which is central to HNV livestock systems, has declined drastically over the last decades. This initiative raises the awareness of people on the need to preserve the biodiversity related to shepherding and the shepherds themselves.

Source: Iñigo Doria, Ardilatxa K. E. (2015) Innovation in shepherding in the Basque Country, La Cañada - Number 30 Winter 2015, http://www.efncp.org/download/LaCanada30.pdf

SUB-THEME: FARMERS' MARKET

Short description of the innovation:	Online sales linking urban and rural populations and supporting small-scale producers from Cévennes (France).
Related themes/concepts/keywords:	Short marketing chains; Farmers' direct sales via internet

Examples of innovative use of [farmers markets]:

HNV system concerned:	Potentially all HNV farming systems, but it does not specify the production systems in this initiative
What is the innovation:	Internet sales – using an on-line platform
Stage of development:	Re-organisation following the crisis in 2008

The Cévennes is a mountainous area, covering parts of Ardèche, Gard, Hérault and Lozère (France). Consumers place their orders either via the website or phone, then their bag of produce is assembled and deposited at one of 15 collection points .

Who initiated and who joined/followed?

It was initiated in 2000 by a university graduate who was trained as a local development 'animator'. He became the first Director of TD. TD aimed to create a link between the producers and consumers so that the latter get really fresh food all year round and the former are properly paid. To begin with, TD only covered a small area, and about 10 producers were involved. The producers gradually began to take over more of the management of the initiative and today there are 60 regular suppliers. A board of 4 -5 producers and consumers manages the scheme.

Identified enabling conditions or success factors

The catalyst role of the person that initiated the concept and made it happen and develop in the difficult economic period. The funding which helped them build a cold store, conduct market research as well as employ young people (even if on temporary basis).

Identified gaps and/or limiting factors

One of the major challenges for the scheme has been the logistical difficulty of assembling the customer orders using produce from a large number of small producers spread over geographical distance. The current arrangement is that producers make their own deliveries to a central warehouse from where, a distributor takes the produce to the different collection points.
Other reported challenges were related to the (1) management of cash flow which was addressed by paying the producers a regular amount each month; and (2) the development of a sophisticated website which can manage all the orders and payments required considerable IT skills.

Benefits to HNV farming systems, farmers and communities:

This initiative is described from the perspective of benefits and challenges for short-supply chains thus has no reference to the production systems involved. The Cevennes is a Natural park but this by itself does not make the producers HNV farmers or the products HNV products.

Source: JRC (2013) Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, http://agrilife.jrc.ec.europa.eu/documents/SFSChainFinaleditedreport_001.pdf

SUB-THEME: SHORT MARKETING CHANNELS

Short description of the innovation:	Launching first mountain peasant market and opening of farmers' shop "Flavours and colours of the mountain" (short supply channels) as part of the initiative to maintain quality of landscape and rich heritage through re-opening abandoned mountain land with the objective of protecting the image of the quality of famous local products, particularly cheese (Saint Amarin Valley, part of Regional Nature Park in the Vosges Mountains, France).
Related themes/concepts/keywords:	Direct sales/marketing; Short-supply chain; Local labelling

Examples of innovative use of [short marketing channels]:

HNV system concerned:	HNV livestock; HNV mosaic – permanent pastures (re-open the landscape and to conserve the agro-pastoral areas through re-opening mountains lands and opening farmland under the agro-environmental measures (AEM) and landscape plans)
What is the innovation:	Utilisation of regional-specific characteristics and promotion of the regional/local heritage through production of traditional local food, set up of local networks and public-private partnership
Stage of development:	Full development; the initiative is in stabilisation phase, having started in the 1980s

Dairy (no collective collection/processing of milk), meat and meat products are processed at the farms and sold directly or through different short marketing channels (mountain peasant market and farmers' shop "Flavours and colours of the mountain"). Additionally, during the time farmers use also other methods of marketing dairy products: the open (farmers') markets, grocery stores and supermarkets in the region, home deliveries, restaurants, inn keepers and on farm sales. The distribution of meat is more individual through the cattle dealers, producing sausage for direct sales from the farm or open markets and fresh meat cuts mainly sold in small boxes. Usually, meat and meat products are picked up by customers from the farms. Three farms have their own cutting rooms and meat processing facilities. Few restaurants use local meat also.

Who initiated and who joined/followed?

The young farmers and new entrants were initiators. Later, established farmers, authorities at the municipality and community of municipalities levels (mayors and public servants), Regional National Park officers, Chamber of Agriculture, the "Syndicat Mixte" and civil society started to participate and play a significant role in the cooperation process. During the years many partnerships and collaborative activities were undertaken: 1) the formation of the association "Agriculture and Landscape" aimed at implementation of an action plan for the management of collective equipment, training sessions, and creation of a farm shop to promote local products. Cooperation and common activities with the recreational system (tourism).

Identified enabling conditions or success factors

The catalyst role for young farmers and new entrants - "idealistic" young people who want to "live, work and decide in their country"; strong collaboration between farmers' network and local representatives, Chamber of agriculture, and officers of the Community of municipalities; collective (for farmers and local representatives) learning/training about the landscape management, organization of collective markets and collective shop; present interest in consuming local and fresh products (especially because of BSE and other sanitary crisis).

Identified gaps and/or limiting factors

Land and markets availability (difficulties mainly to the young farmers and new entrants to assess them); less active young people; economic and financial difficulties.

Benefits to HNV farming systems, farmers and communities:

Ensuring long-term conservation of the HNV grasslands and landscapes, and protection of the biodiversity using the traditional agri-environmental practices. It is also beneficial in order to increase incomes for HNV farms as well as their image and awareness of the society about local products preservation.

Source: Draganova M., M. Peneva, Y. Kazakova, Pl. Mishev, C. Gonzalez, T. Pinto Correia, M. Diaz, C. Darrot. (2012). Synthesis report - Cluster 7: High Nature Value Farming. http://farmpath.hutton.ac.uk/

SUB-THEME: COMMUNITY SUPPORTED AGRICULTURE (CSA) PARTNERSHIP

Short description of the innovation:	Farmers and consumers cooperation for direct, trust-based market relationship in the form of CSA, operating around the city of Timisoara (villages of Cuvin, Fititeaz and Belint), Romania
Related themes/concepts/keywords:	Direct sales/marketing

Examples of innovative use of [community supported agriculture]:

HNV system concerned:	HNV mixed/mosaic Organic farming; vegetables production
What is the innovation:	CSA offers an interesting alternative way to create an innovative and economically viable connection between farmers and consumers.
What stage of the process is it in: *beginning <-> full development*	It is in the beginning.

Three farmers work under the umbrella of the Association for the Support of Traditional Agriculture (ASAT), which was initiated in 2009 by the Centre of Resources for Solidary and Ethical Initiatives (CRIES), a local NGO with the main aim of promoting social economy in Romania. The consumers' solidarity is sought as the partnership relies on mutual goodwill and trust and has no mechanisms of enforcement. Prospective consumers have to contact CRIES and sign the ASAT contracts in the winter on a first-come-first-serve basis. The next step is the financial contribution the consumers

make to the partnership in a form of an up-front payment. The annual cost for the entire season for a consumer-partner is calculated so as to support the costs of the farmer from the start of the season, including transport and packaging costs, a fair salary for the farm family, as well as health insurance contributions.

Who initiated and who joined/followed?

CRIES was the main promoter of the idea and took over responsibility for attracting the interest of consumers and the farmers. Their main characteristics are: small-scale farms; full-time occupied with vegetable farming; farm experience between 6 and 20 years; only one of them has officially registered his farm and is in the process for organic certification; none of the three has a real rural background; they are all relatively well-educated and see themselves as entrepreneurial farmers, with a desire to go beyond subsistence-farming, very active in their communities, but none of them is member of a farmers' organization.

Identified enabling conditions or success factors

The catalyst role for ASAT and CRIES; young well educated farmers who cares about the environment and food quality and safety; active consumers that have a special connection to the rural environment: grew up on farms, visited often, or have a garden at home and social capital, measured as membership in organizations: one third of the consumers were members in at least one organization such as sports clubs, the Red Cross, political parties, or CRIES; consumers' behaviour which are concerned with the origin of the food they purchase, checking labels and ingredient content of processed food.

Identified gaps and/or limiting factors

Relatively high investments in relation of organic farming certification; no bank loans availability – private funding; labour intensive work on the farms.

Benefits to HNV farming systems, farmers and communities:

The ASAT charter formulates the basic principles of the CSA according to which the farmers should maintain biodiversity and a healthy environment, guarantee nourishing and healthy products, take care of transparency regarding costs and price, involve no intermediaries, and constantly inform the consumers about the state of crop growing and the problems the farm is facing.

Socio-economic benefits: increase of farmers' income, avoiding farm income to be subject to price fluctuations because no middlemen are involved and a fair price is part of the CSA contract; lower risk and marketing efforts from farmers so they can concentrate on farming; higher reputation and trust of the consumers and society as whole; improvement of farming and business skills of farmers; fresh, healthy, seasonal food for consumers at reasonable prices.

Source: Birhala, B., J Moellers (2014) Community supported agriculture in Romania. Solidarity partnerships as viable innovations for small farms? EAAE congress 2014, Ljubljana, August 2014

4.5 Key findings from the review on HNV markets and products innovations

Some reflections on the framing of this theme

In the process of framing the Markets and Products Innovation theme, our team considered that innovation would be found in the local food systems - markets and short food supply chains and their associated forms such as community-supported agriculture (CSA), on-farm sales, on-line sales, farmers

markets, delivery schemes (box schemes), festivals and fairs, etc. In most cases, they are defined in opposition or as alternative to conventional food supply chains and as a new form of food production, marketing and consumption based on an improved connection between producers and consumers (personal relationships), spatial proximity and a minimised number or no intermediaries between the producers and consumers.

Our combination of search terms resulted in only a few publications on markets and products innovations in HNV farming systems mostly from Romania (Akeroyd&Page, 2011, Popa, Gherghiceanu, Balint, 2010), Bulgaria (Dzhabarova&Peneva, 2014, Peneva&Kazakova2015) and UK (Winter, 2005).

In some publications, where we had a search match between "HNV farming systems" and market and products key words, we found what we call "wishful thinking", for example "in order to preserve this HNV system, it will be good to develop local markets and direct sales, to add value to products and to increase farmers' incomes…". As a rule, we have not included them in this review or the bibliography (section 3.7).

The publications focused on market innovations or alternative markets such as short-food supply chains, farmers markets or community supported agriculture are significantly more (see Section 2.6 Bibliography), and describe both the theoretical background and case studies of actual implementation. For example, a study commissioned by the EU/COR (Progress Consulting/Living Prospects, undated) describes in detail six local and regional initiatives and outlines the following characteristics of local food systems:

- Greater interaction and mutual knowledge/understanding between consumers and producers.
- Reducing the food kilometres (miles).
- Providing fresh, seasonal produce.
- Offering traceability of produce origin and identity values.
- Supporting local economies and viability of rural areas, often allowing access to the market by small or micro rural food producers and business opportunities for on-farm or localised food processing.
- Valorising local assets such as landscapes, territory, or biodiversity.

At the same time, the study also recognizes that high quality products, nature conservation or other environmental benefits are not necessarily equal to local food systems. Mansfield and Peck (2013) also underline that local production does not mean a reduction in intensification of production. Several authors discuss the concept of "local" and/or "localness" (Kjelsen et al. 2006, Mansfield and Peck, 2013, Winter 2003). They all agree that the geographical proximity in itself is not creating all the positive benefits from the system such as more revenue going back to the producer rather than to the middleman; money being retained in the local economy, local foods promoting tourism, reducing social isolation and improving community cohesion. Kjelsen et al. (2006) underline that "spatial integration is not the same as social integration" and that the local scale may not be economically viable for spatially distributed producers and consumers concentrated in the bigger cities. The report on European Food Systems in a Changing World concludes that there is a wider set of issues, beyond environment, that alter the sustainability of a supply chain and that the reality is "it depends".
This raises an important point of caution for the identification of Markets and Products Innovations in the learning areas – the benefits to the HNV farming systems have to be clearly identified and explained for a Market/Product innovation to be considered HNVf Market/Product Innovation.

In general, local food systems are dominated by small and medium-sized farms and/or microenterprises, producing at small scale (Galli & Brunori 2013; Kneafsey et al. 2013; Renting et al. 2003; Schonhart et al. 2009), which are not competitive in the conventional supply chain. However, the scale of production by itself is not an indication of HNV.

Following on the notion for greater interaction between producers and consumers, and the implied assumption that consumers are well informed and tend to choose more environmentally-friendly products, there are contradicting findings in published reports. A study by Westberg et al. (2006) reports that consumers show no or little interest in the way the product are produced, and that meeting farmers face-to-face is actually of importance to them. They go on stating that consumers are not interested in learning more about the conditions of farming in order to be able to judge whether the products that they buy are produced in a more or less sustainable way. Instead, they seem to be satisfied with having found farmers to whom they trustfully may delegate this judgement. Winter (2005) indicates that the provenance of food products may be a concern to consumers, but the nature of the links between the social meaning attached to provenance and the biological and physical characteristics of foodstuff remains a matter for further research. At the same time, Bernués et al. (2012) in a study of consumer preferences towards the quality attributes of lamb meat document that some consumers consider that the feeding system is a key extrinsic quality attribute of meat. Even more, all consumer groups preferred the feeding systems based on pasture and forages rather than cereal-based ones. The EU SCAR report on sustainable food consumption and production in a resource-constrained world (2011) refers to the direct interactions between farmers and urban population in niche markets as "interesting fields of experimentation how the consumers can be better informed and be realistic about how their food is produced." Dinis (2006) discusses the niche marketing strategies as the strategic choice that innovates and adds value to rural products. She considers that those who adopt marketing niches strategies specialize in serving niches that large competitors overlook or ignore. The key feature for creating a niche market is the image, and in the case of rural products, this is the image of locality and quality. She develops further that the use of marketing tools demands a strategic vision of the territory (and its resources) and the segments of market that it intends to achieve. These studies raise questions about the role and importance of (the image of) locality and food quality and how they are communicated to and appreciated by consumers. Moreover, if this communication and appreciation are put back in the farming system in the form of maintenance and improvement of the High Nature Value of the territory and the food products.

Novel products from grasslands?

There is an observed rising research interest in the use of grasslands for bioenergy as reported during the meetings of the European Grassland Federation (2010, 2011, 2014). A study by Thumm et al. (2014) classifies permanent grassland into three types with regard to management intensity and productivity. From their perspective, type 1 is the high-yielding, intensively managed, agriculturally improved grasslands. It provides biomass with qualities suitable for anaerobic fermentation and biorefinery and its use in biogas plants is a well-established practice. Type 2 is the grassland biomass from semi-natural grasslands and type 3 is from landscape conservation areas. Both of them have higher lignin contents and requires pre-treatment before the fermentation or hydrolysis process can break down the cellulosic fibre. Thumm et al. (2014) state that these novel pathways for grassland biomass can help to preserve the multifunctionality of grassland in the landscape, even without traditional livestock farming. At the same time, they recognise that the costs of harvesting, transporting, conservation and

conversion of grassland biomass, especially from low-yielding areas, can be too high for a cost recovery without subsidies. One would argue that the same is valid for traditional grassland management of HNV grasslands by livestock farming – cost recovery is very difficult without subsidies! They go on further by stating that "for grassland areas with conditions which make harvesting of biomass by machinery problematic, traditional pasture systems are more suitable". Thus, they concentrate the interest of grassland biomass on the high-yielding, intensively managed, agriculturally improved grasslands. This makes one think that this novel product from grassland is not and probably would never be classified as HNV product innovation.

Enabling conditions that made the HNV innovations happen

Based on the examples provided in section 2.3., we identify the following enabling conditions:

- The catalyst role of a person or core group of people who are motivated and convincing to develop the initiative; Usually these are young and/or well educated farmers and/or consumers who care about the environment and food quality and safety;
- Strong collaboration between farmers' network and local administrations, chambers of agriculture, etc.;
- Collective (for farmers and local representatives) learning/training about the landscape management, organization of collective markets and collective shop;
- Funding, available in the right moment, which helps supporting the core team/skills and/or investments (eg. in cold store, website design and maintenance, etc.)

Success factors

A snapshot of the success factors to market and product innovations, summarised from the examples in section 3.4. and the reviewed sources:

- Capacity building and tailored advisory services and well as targeted training for farmers to manage the high nature values on their farmland, while also adding value to their products;
- Motivation to acquire new skills, knowledge and approaches for marketing and sales management techniques;
- Increased confidence of farmers in their work and place in the community as a result of their involvement with local food marketing activities and willingness to try other new approaches;
- Commitment for and actual cooperation between producers to create an image of their products and to market them in short supply or local food systems;
- Considerable local consultation and negotiations, building confidence, mutual knowledge, and increasing awareness of different actors' concerns and of the long-term impacts of the different strategies;
- Investment support to meet new production and marketing requirements
- Availability of (skilled) labour that can step in and support the increased requirements

In Bulgaria, an assessment of three market and food innovation initiatives (Peneva and Kazakova, 2015) indicate the following factors, which had a role in the success of the initiatives: acquiring new skills and knowledge about the implementation of good hygiene practices; new design skills for jars choice, packaging, and labelling; marketing techniques to retain customers and to build long-term relationships; management of sales, etc. It includes learning and collaboration, which are running differently in the three studied initiatives due to the differences in their objectives, actors involved, and connections between them.

The key reasons for the success of Bessaparski Hills initiative (Kazakova, 2012), which links the management of HNV grasslands and marketing of food products, are: (1) a small grant scheme designed specifically for the project areas and responding to the real needs of the farmers to maintain the HNV grasslands. (2) The small investment component gives the farmers the opportunity to modernise their farms and to continue their business while applying nature-friendly agricultural practices, without entering in heavy bank loan procedures. (3) The mobile teams and especially the personal contact at farm and household level are very important in order to motivate farmers to participate. This also puts a very heavy responsibility onto the consultants' shoulders, since farmers come to rely on their advice. (4) The small grant scheme supported local development initiatives such as the Kurtovo vegetables festival, which continues long after the project ended (see example in 2.3.). (5) The project provided training to farmers on hygiene requirements and practices, better packaging methods, which allowed them to participate at local markets and traditional food festivals across the country and add value to their products.

In Romania, Adept foundation carries out an integrated conservation, rural development and agri-environment programme, linking economic and social benefits with biodiversity conservation, and raising local capacity for good management in the future in Tarnava Mare region (Akeroyd, Page, 2011, Popa, Gherghiceanu, Balint, 2010). Adept team has identified two groups of challenges to the sustainable future of HNV farming in the area: (1) Lack of social and economic incentives; and (2) Poor agricultural management either by intensification or by abandonment. Adept implements a range of measures to create demand for products, and to boost local income from agriculture. This aims to improve the economic viability of small-scale producers and of small-scale farming communities. Courses for small producers are organized so that the EU hygiene rules do not threaten traditional food production. At the same time, the team works towards establishment of farmers' markets and organisation of local festivals, where producers sell their own products; designs and builds a community food processing centre and low-technology solar driers, as well as helps the development of marketable, aged cheeses to add value to cow and sheep milk (the main cash product of the area). All of the above activities aim to help individual farmers to make the step from domestic to small-scale commercial production. However, Adept project team (Page, Popa, Gherghiceanu, Balint, 2012) reports that small-scale farmers in Romania will not take the initiative to solve practical problems to meet quality and other commercial standards since they generally have a fatalistic and passive approach; and that integrated planning by qualified advisors can solve such problems in rural areas. They also stress that small-scale farmers respond to advisory services when they are available and that this approach can bring commercially viable and long-term solutions.

Euromontana (SARD-M report 2010) reports on several mountain initiatives based on the cultural and environmental assets of the areas. One of them is about the Rhon Biosphere Reserve, where a range of local food products and brands has been created by local actors, facilitated by the Biosphere Reserve units. Added value agricultural products (from organic and conventional production) of Rhon lamb, milk, beef, apples and other crops are offered to residents and tourists through local shops, restaurants, and by export to wider markets. The Rhon regional label was created to promote these regional products and services by complying with a set of process quality criteria.

In this process, the three Biosphere Reserve units (one from the each of the three administrative units) have played a critical role by motivating and bringing partners together, moderating and mediating to resolve differences, co-ordinating projects and identifying priorities, and helping to raise funds

(Pokorny 2008). Financial support from EU Structural Funds and CAP (including LEADER), and the EU LIFE Programme has been an important incentive. State funding as well as district and municipal funding and private sponsoring is being used as sources for projects. They summarise the following lessons learnt as regards markets: bottom-up initiatives may be more difficult to monitor and evaluate because of the diversity of funding sources, programmes and projects. This may make it difficult to get an overall picture of impacts and outcomes; positive economic impacts may be evident at farm level as a result of projects such as the Rhon BR but may not be seen in regional economic data (Ploeg 2000); clusters of synergetic activities (particularly nature conservation, farm tourism, quality production and direct marketing) are likely to be particularly important (Knickel and Renting 2000). The clustering can happen at farm level, and also between different sectors at local level. The positive effects increase with time.

Limiting factors

A snapshot of the barriers and limitations to market and product innovations based on the examples in 2.3. and other publications:

- Limited availability of additional labour to run new enterprises;
- Lack of capital and reticence to take on additional loans or debt;
- Lack of slaughtering facilities in many geographical areas;
- The registration of an EU quality label (PDO, PGI or TSG) is a long and costly process.
- Logistical difficulties of assembling produce from a large number of small producers spread over geographical distance;
- The need for skills and technical knowledge to develop a sophisticated websites to manage all the orders, payments and deliveries for Internet sales;
- Changes in personal circumstances of core team members that reduces their commitment to the initiative;
- Changes in the level of support from the municipal authorities, especially following the local elections.

Peneva and Kazakova (2015) identify a set of hindering factors for the development of local food systems in three HNV marketing initiatives: marketing channel limitations due to variations in product quality and small quantities of produce; lack of adequate consumer information both in terms of quantity and quality; absence of strategic promotion of the studied regions; limited access to financial sources for investments; legislation and policy support regulations.

Mansfield and Peck (2013) state that the ongoing changes in the CAP and the instruments used to support its objectives including the integration of environmental and nature conservation concerns are leading to destabilization of the farm management systems and declining profit margins for farmers, who as a result have three restructuring option: (1) reduce costs of production where possible and continue with ever decreasing profits; (2) withdraw from farming altogether; or (3) diversify production. For the needs of this review, the third option is of particular interest. They analyse the diversification option of Cumbrian farms (UK). The limitations the authors recognize are related to the limited availability of additional labour to run new enterprises, since this is usually the first cost to cut to save on production costs. Another barrier is related to the lack of capital and reticence to take on additional loans or debt. This is also valid for the grant schemes, which require matched funding.

The impact of the food hygiene legislation can be restrictive to market and product innovations for a variety of reasons. For example, the requirements for PDO registration state that all production

processes must be performed in the designated area. Mansfield and Peck (2013) indicate the particular problems with slaughtering arrangements. They give the example of the Rough Fell lamb group in south-west Cumbria, where the lack of a slaughtering unit in the specified geographical region has stymied achieving PDO status for the foreseeable future (Mansfield, 2008).

The registration of an EU quality label (PDO, PGI or TSG) is a long and costly process, which also requires organisational skills and networking abilities for the producers. The registration of a producer group or an association is a requirement for registering a product, as is the identification of clear boundaries and production process. The model of European and French PDO has been promoted in international for a as a suitable political option in order to favour both biodiversity conservation and support farmers (Boisvert 2006 cited in Carona et al., 2010). However, the inclusion of environmental or nature conservation provisions in the product specifications is not yet a obligatory requirement for EU quality labels registrations. Indeed, a number of studies reveal that PDO products are not necessarily favouring nature conservation since the practices and the various elements of the production system that are likely to have impact on biodiversity such as production diversity and intensity, spatial organization and land use are only partially or not regulated (Carona et al. 2010, Gueringer et al. 2010). Even more, there may be significant differences in the production practices within the same producers group, which complicates additionally the distinction of an HNV and non-HNV products by consumers.

For example, the experience from the Cevennes National Park and Biosphere reserve presented in the SARD-M report raises two key questions about PDO/PGI registrations: how strict should the product specifications be?, and how tight to a specific territory should a marketing scheme be? The report also underlines that answering them requires considerable local consultation and negotiations, building confidence, mutual knowledge, and increasing awareness of different actors' concerns and of the long-term impacts of the different strategies. These questions concern the sheep breeders within the park, and especially in the more difficult and mountainous areas, who continue to produce more traditional - Agneaux de parcours - free range lamb. This production system is better than indoor rearing at ensuring that the meadows and moorland continue to be grazed and it helps to avoid land abandonment. Producers have considered both organic certification and PDO/PGI status but have decided the administration costs and production constraints would be too great for such a low production volume. Instead, they have developed their own criteria for production, which they monitor, and market as their own private label (Blanc and Roueb 2005 cited in SARD M report). They indicate that the combination of production, protection of the environment and local marketing may be too difficult to achieve.

Another perspective on the limiting factors is provided by the SUS-CHAIN project, which is focused on marketing sustainable agriculture and the potential role of new food supply chains in sustainable rural development. It refers to corporate retailers as 'the 95%' because they deliver approximately 95% of the food; while the small-scale, local, regional, artisan, organic, ethical, traditional and direct sale initiatives are 'the 5%'. The synthesis of bottlenecks and constraints, identified by SUS-CHAIN project are relevant to our assessment of the HNV farming innovations and gaps:

- "Regulations usually relate to 'the 95%', and sometimes they are not relevant for 'the 5%', or even more, may fail to recognise positive aspects of 'the 5%';
- Most financial support still goes to mainstream production and marketing (the 95%) in order to support their business competitiveness, and is not well targeted to the support of alternatives (the 5%).
- A lack of appropriate small and medium scale processing, storage, preservation and marketing facilities is adversely affecting the development of alternative small-scale food supply chains –

eg. closure of large numbers of smaller-scale abattoirs or organic produce being sold as conventional with no price premium being paid.

- There has been a general 'stripping out' of the middle – declining numbers of regional wholesalers; the demise of medium-sized processors; and the huge reduction in smaller and medium-sized retailers. The effect of this has been that it is now much harder to scale up smaller-scale (5%) initiatives, because in many cases there is no longer an infrastructural stepping stone available; etc."

Recommendations from the literature

There is a limited number of actual recommendations for the practical implementation of the Markets and Products Innovation in the reviewed papers. Some of the conclusions, which can be translated into recommendations include:

- A critical factor in improving the sustainability of food supply chains is to increase the volumes involved, whilst retaining the underlying quality and exclusivity of the product concerned (SUS-CHAIN project);
- Poor communication to the end-consumer about the sustainability attributes of a particular food product denies the opportunity to persuade them of the broader 'value' of a product they might wish to pay a price premium for (SUS-CHAIN project);
- The success of some rural economies based on small firms that naturally emerged calls attention to the importance of networks and to the fact that what small firms need is an information/business network that supplements their advantages of being small, namely their flexibility and ability to respond quickly (Dinis, 2006). She cites Pyke and Sengenberger (1990) that "the key problem for small firms appears not to be that of being small, but of being isolated";
- The success of niche marketing actions depends on cooperation and adjustment of actions between the different actors (individuals and organizations) that live in (and bring to life) a territory (Dinis, 2006).

4.6 Recommendations to the Learning Areas for the identification and description of markets and products innovations

The recommendations provided in this section reflect the findings of the literature review and aim to help the narrative of the innovation vis-à-vis the analysis carried out for the Baseline Assessment in WP1 and assessment of effects of the innovation to the socio-economic status of HNV farming, farms and communities. Therefore, they should be treated as having an orientation and guidance function as opposed to a step-by-step instructive role.

Defining and describing HNV innovations in markets and products at LA level

According to the Oslo Manual (OECD 2005), innovation is defined as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practice. This definition is fully applicable to this project study.

The distinction between innovations new to the world and those new to the adopter (HNV farmer) is important and should be made. It is not necessary, neither does innovation require invention and investment in R&D from the farmer/s. In general, innovation refers to the change in the way something is done (organizational, technological, market, legislative) usually for different reasons such as resource use efficiency, saving costs or providing better services to users etc.

Companies and famers can innovate by adopting technology/approach developed by other companies or organizations, even when it involves technology/approach that has been around for some time and is not leading edge (Kemp and Foxon, 2007) but it is novel to the farm/organization. Therefore, any new action of farmer/s/organisation (formal/informal) that presents and/or distributes (implementation of a marketing method not previously used) their HNV products (either new or existing) in different way, is innovation.

The proper description of the initiative should consider also questions identifying the process of idea generation (what are the mechanisms and tools used for the idea generation? or what provoke the idea?)

Defining and describing the innovation initiators and participants/ stakeholders/ followers

It is very important to identify actors (farmers and non-farmers, individuals and organisations (e.g. universities, advisory services, credit institutions, governmental authorities, local authorities, R&D departments, NGOs) involved in the HNV innovation. Geels (2004) states that socio-technical systems do not function autonomously, but are the outcome of the activities of human actors, which belong to certain networks and societal groups defining and guiding their activities, perceptions, problem-agendas, norms, preferences, linkages and interrelations. Within the societal groups members use a particular language (linked also with the education, books, web-sites, journals they read etc.), have similar stories of their past and vision for future, specialization and share common historical facts etc. Therefore, for the innovation development and diffusion are important not only the agricultural and farmers' system and structures but also the other groups' (e.g. users, societal groups etc.). The different groups also interact between each other, and form networks with mutual dependencies (Geels, 2004) which are important for innovation implementation and which are spread over larger areas and tend to be stable over time (Darnhofer, 2011).

In this regard, the following information, which is to be collected for the Baseline Assessment, is needed at LA level to define the different actors and their roles as well as to assess the possible influence between different actors' networks:

- socio-economic characteristics of the individuals (age, education /training, sex, connections with the territory – relatives, friends, etc.) and/or of the group of farmers;
- main characteristics of the farm/s: ownership on the farm assets (inheritance, newcomer), size (semi-subsistence vs. market oriented; advantages and disadvantages of the HNV farms, eg. small have more flexibility and responsiveness but have difficulties to generate investment capital; level of management, labour force skills), production practices (extensive, intensive, organic, HNV other, combinations), production structure (including outputs: raw materials and/or process products), sales (market, barter with relatives/neighbours);
- existence of knowledge about agriculture and effects of the production on nature; eg. farming in protected areas, what skills are required for farmers to manage it?

- awareness about biodiversity importance both for environmental sustainability and system productivity – synergy effects; do farmers interact with external/third parties – which are they and how the interaction happens?
- awareness and importance of consumer preferences, health protection etc. – how much (time and money) farmers spent to understand them? do farmers interact with external/third parties – which are they and how the interaction happens?
- formulation of common vision for future viability of the innovation (or how different are the visions of different actors?)

Describing the life stage of the innovation (process)

Kemp and Pearson (2007) define innovation as ongoing process as the actors, groups and networks are defined by their (relative) temporal and spatial stability. Innovation continuation and diffusion is influenced by advances in (internet and communication) technologies, changes in market or consumers' preferences etc. and farmers' ability to further improve their product/s and/or marketing processes. New uses and users may be found during diffusion phase, which may lead to new characteristics of the innovation (Kemp and Pearson, 2007).

Identification of the time span and the phase of development are important because the innovation could be influenced by the farm business cycle, the lifecycles of farm products, cultural and societal movements etc. Thus, the analysis of the drivers and barriers for the innovation should be as deep as possible. Information that can help the description of the life stage includes:

- starting year, in order to identify the speed of the innovation development;
- dynamics of the system and changes at farm level – is it kept the same, is it an adaptation, a redesign or absolutely new system implementation etc.

Current changes and state of the art in the LA

It is important to identify (changes in) the market actors, relations and interrelations between and within them and their networks. Additional information will be required about:

- Marketing channels (how farmers interact with the suppliers and consumers, e.g. joint deliveries, marketing cooperatives, farm/internet direct sales, fairs, local shops/restaurants etc. and how it has been changed? In this respect, how marketing costs have been changed? (if there was a change))
- Has a process of diversification taken place? For example, additional processing and/or tourism related activities development? Horizontal value added? Are there any vertical value added activities: cooperation through the value chain with other actors?
- Have farmers started marketing activities as promotion and information dissemination? what kind of channels have been used? importance and costs for each one?
- Role and importance (including costs) of different actors of the advisory system (governmental/nongovernmental)? role and importance of research/educational institutions? If there are no interrelations with advisors/trainers/researchers, why?
- Change in farmers' role and positions in society (positive externalities) – understanding about the "price" of ecosystem services; food/non-food products and service provision

Drivers or obstacles to look for in HNV markets and products innovations

Nill and Kemp (2009) raised the question of an appropriate policy framework for sustainable innovation policies, which are addressed by the Regulatory Framework theme.
Another important driver is that powerful actors support the innovation, use their financial, organizational or political capital to stimulate its development, and thus overcome resistance from other social groups.

Defining and describing the impact of the HNV markets and products innovations at LA level

Boons et al. (2013) claim that sustainable development requires radical and systemic innovations. Review made by Montalvo (2008) presents a considerable amount of knowledge on what drives sustainable innovation at the firm level in industry and services sectors. However, there is less knowledge about how sustainable innovations can be realized in the farming sector and how it can be profitable/viable for the actors involved in the process – from farmers to consumers. Therefore, defining multiple benefits from HNV systems for both sides and identifying the needs for faster diffusion of innovations within them is an important question of the project. In this regard, farmers and consumers' assessment of the benefits are needed as well as an assessment of the incentives that would foster their activities.

4.7 Useful sources

Sub theme: Farmer's market

1. European and United States farmers' markets: similarities, differences and potential developments, http://ageconsearch.umn.edu/bitstream/58131/2/Vecchio.pdf
2. Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania, http://www.mountainhaymeadows.eu/online_publication/14-linking-high-nature-value-grasslands-to-small-scale-farmer-incomes-tarnava-mare.html
3. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, http://agrilife.jrc.ec.europa.eu/documents/SFSChainFinaleditedreport_001.pdf
4. Short Food Supply Chains as drivers of sustainable development, http://www.foodlinkscommunity.net/fileadmin/documents_organicresearch/foodlinks/CoPs/evidence-document-sfsc-cop.pdf
5. Local Food Systems in Europe: Case studies from five countries and what they imply for policy and practice http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/FAAN_Booklet_PRINT.pdf
6. "Marketing Sustainable Agriculture: An analysis of the potential role of new food supply chains in sustainable rural development", http://www.sus-chain.org/results/WP5/BE%20Westhoek%20hoeveproducten%20-%20final%20report.pdf

7. Rural Development and High Nature Value Farmland in Romania (project broshure), http://www.fundatia-adept.org/bin/file/hnvf_2013-2016/Brochure%20HNVF%20ENG_web.pdf
8. Learning our way towards a sustainable agri-food system. Three cases from Sweden: Stockholm Farmers market, Ramsjö Community Supported Agriculture and Järna Initiative for Local Production, http://orgprints.org/2838/1/ekolantbruk38.pdf
9. Niagara region farmers' markets: local food systems and sustainability considerations, http://www.tandfonline.com/doi/pdf/10.1080/1354983042000219351?needAccess=true
10. Embeddedness and local food systems: note on two types of direct agricultural market , http://scholar.google.gr/scholar_url?url=http://xa.yimg.com/kq/groups/69248363/229242101/name/EMBEDEDNESS%2BIN%2BCOOPERATIVES%2B3.pdf&hl=el&sa=X&scisig=AAGBfm08eFa43QokAwziMN2f14ODqk_cFA&nossl=1&oi=scholarr&ved=0ahUKEwik7OT9xZHPAhWGvxQKHUWnD-gQgAMIGygAMAA

Sub theme: Branding of products

1. Geographies of Origin and Proximity: Approaches to Local Agro-Food Systems, http://cultureandhistory.revistas.csic.es/index.php/cultureandhistory/article/viewArticle/89/309
2. 'Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians', pp 33, pp 36, pp 60, https://www.google.ro/url?sa=t&rct=j&q=&esrc=s&source=web&cd=30&cad=rja&uact=8&ved=0ahUKEwjR6OqU0YzOAhVEPxQKHc6oBk8QFgizATAd&url=http%3A%2F%2Fwww.southeast-europe.net%2Fdocument.cmt%3Fid%3D831&usg=AFQjCNGpnEtxlujlpHkcGfzGW2GNY5qNoQ&sig2=wFIuYLX-Om--ZaD-wYIhMQ
3. IMPLEMENTING INNOVATIVE ECOLOGICAL SOLUTIONS FOR FARMERS AND RURAL COMMUNITIES, http://organic-congress-ifoameu.org/wp-content/uploads/2014/09/8EOC_proceedings.pdf
4. P.D.O. : THE BEST PROOF OF AUTHENTICITY, http://www.fromages-aop.com/wp-content/uploads/3678AOP302_Dossier_Presse_A4_GB.pdf
5. MOUNTAIN DEVELOPMENT BASED ON CULTURAL AND. ENVIRONMENTAL ASSETS. European case studies and proposals to guide. Carpathian and Balkan projects, pp 12, http://www.euromontana.org/wp-content/uploads/2014/08/sard-m_report_v2_light.pdf
6. Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to Mediterranean Regions, http://www.ifoam-eu.org/sites/default/files/page/files/ifoameu_policy_biodiversty_handbook_201011.pdf
7. Green Food Project Geographic Sub Group Report, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69570/pb13799-greenfoodproject-geographicsubgroup.pdf
8. Rural Development and High Nature Value Farmland in Romania (project broshure), http://www.fundatia-adept.org/bin/file/hnvf_2013-2016/Brochure%20HNVF%20ENG_web.pdf

9. Background analysis and documentation as basis for the development of the Carpathian Convention Sustainable Agriculture and Rural Development Protocol, http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/03%20Meetings%20and%20Events/Working%20Groups/Sustainable%20Agriculture,%20Rural%20Development%20and%20Forestry/WG%20SARD_April2015_Serbia/Report_Carp_Conv_Background_analysis_Agriculture_030415.pdf
10. Agricultural product quality: a success factor for EU rural areas, http://groupedebruges.eu/sites/default/files/publications/downloads/enrd_rural_review8_organic_farmingquality_productsen.pdf
11. Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania, http://mountainhaymeadows.eu/online_publication/14-linking-high-nature-value-grasslands-to-small-scale-farmer-incomes-tarnava-mare.html
12. Sustainability of Local Agri-food Products in the Border Area of Northern Portugal and Castilla-Léon, http://econpapers.repec.org/paper/agseaa116/94925.htm (add to the list in excel)
13. Food commodities, geographical knowledges and the reconnection of production and consumption: The case of naturally embedded food products, http://eprints.glos.ac.uk/445/, (add to the list in excel)

Sub theme: Festivals for direct marketing of local food and HNV products

1. Direct Marketing for High Nature Value Products – The Bulgarian Approach, http://dergipark.ulakbim.gov.tr/ttdb/article/download/5000091059/5000084460
2. Marketing on local markets', http://cor.europa.eu/en/documentation/studies/Documents/Marketing-on-local-markets.pdf
3. Farmers Weekly Awards, https://www.fwi.co.uk/arable/2016-farmers-weekly-awards-arable-farmer-finalists-revealed.htm
4. Making small scale family farming profitable. Sharing experience from Visegrad countries to Serbian farmers, http://www.ceeweb.org/wp-content/uploads/2015/12/Training-material-IVF-Serbia-draft.pdf
5. Local Food Systems and Rural Development in Bulgaria, http://www.wne.sggw.pl/czasopisma/pdf/PRS_2015_T15(30)_z4.pdf#page=148
6. LOCAL FAIRS-METHOD OF ENHANCEMENT OF THE LOCAL PRODUCTS, 3.amazonaws.com/academia.edu.documents/8362710/acta cib_volum 2009.pdf?AWSAccessKeyId=AKIAJ56TQJRTWSMTNPEA&Expires=1470402897&Signature=sht5M9ZJDm%2BpBvNXGc6tNLC3Rgw%3D&response-content-disposition=inline%3Bfilename%3DLOCAL_FAIRS-METHOD_OF_ENHANCEMENT_OF_THE.pdf#page=92

Sub theme: Innovative products to support HNV farming systems

1. MOUNTAIN DEVELOPMENT BASED ON CULTURAL AND. ENVIRONMENTAL ASSETS. European case studies and proposals to guide. Carpathian and Balkan projects, pp 13, http://www.euromontana.org/wp-content/uploads/2014/08/sard-m_report_v2_light.pdf
2. Multifunctionality and dynamics of silvopastoral systems, https://www.researchgate.net/profile/Sergio_Godinho2/publication/263905628_Multifunctionality_and_dynamics_of_silvopastoral_systems/links/0c96053c4f34a15d87000000.pdf
3. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, http://agrilife.jrc.ec.europa.eu/documents/SFSChainFinaleditedreport_001.pdf
4. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences, http://ec.europa.eu/environment/nature/natura2000/management/docs/FARMING%20FOR%20NATURA%202000-final%20guidance.pdf
5. High Nature Value grasslands Securing the ecosystem services of European farming post 2013, http://www.fundatia-adept.org/bin/file/conference2010/Adept_conference_brochure.pdf
6. Green Food Project Geographic Sub Group Report, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69570/pb13799-greenfoodproject-geographicsubgroup.pdf
7. Innovation in shepherding in the Basque Country, http://www.efncp.org/download/LaCanada30.pdf
8. Managing farmland in Natura 2000 CASE STUDIES, http://www.fundatia-adept.org/bin/file/life/Farming_Natura_2000-Case_studies_opt.pdf
9. High Nature Value Farming for sustainable local food production and consumption, http://ageconsearch.umn.edu/bitstream/182916/2/14th_EAAE_Congress_-_Poster_paper_Peneva%252CKazakova-Mateva%252CMishev.pdf
10. Background analysis and documentation as basis for the development of the Carpathian Convention Sustainable Agriculture and Rural Development Protocol, http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/03%20Meetings%20and%20Events/Working%20Groups/Sustainable%20Agriculture,%20Rural%20Development%20and%20Forestry/WG%20SARD_April2015_Serbia/Report_Carp_Conv_Background_analysis_Agriculture_030415.pdf
11. Biodiversity conservation as a new rationale for localized and sustainable agro-food systems. The case of two French PDO mountain cheeses, http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2010/2010_WS4.1_Caron.pdf

Sub theme: Short marketing channels

1. Europe's ecological backbone: recognising the true value of our mountains, pp 49 *http://www.orobievive.net/conoscere/Europes%20mountain%20areas.pdf*,

2. 'Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians', pp 33, pp 38, pp 67, https://www.google.ro/url?sa=t&rct=j&q=&esrc=s&source=web&cd=30&cad=rja&uact=8&ved=0ahUKEwjR6OqU0YzOAhVEPxQKHc6oBk8QFgizATAd&url=http%3A%2F%2Fwww.southeast-europe.net%2Fdocument.cmt%3Fid%3D831&usg=AFQjCNGpnEtxlujlpHkcGfzGW2GNY5qNoQ&sig2=wFIuYLX-Om--ZaD-wYIhMQ

3. MOUNTAIN DEVELOPMENT BASED ON CULTURAL AND. ENVIRONMENTAL ASSETS. European case studies and proposals to guide. Carpathian and Balkan projects, pp 13, http://www.euromontana.org/wp-content/uploads/2014/08/sard-m_report_v2_light.pdf

4. SHORT SUPPLY CHAIN: ANALYSIS OF THE COMPETITIVENESS OF ORGANIC HORTICULTURAL FARMERS AT ITALIAN REGIONAL LEVEL, http://ageconsearch.umn.edu/bitstream/94918/2/Samoggia-Short_supply_chain-143[1].pdf

5. Making small scale family farming profitable. Sharing experience from Visegrad countries to Serbian farmers , http://www.ceeweb.org/wp-content/uploads/2015/12/Training-material-IVF-Serbia-draft.pdf

6. Marketing on local markets', http://cor.europa.eu/en/documentation/studies/Documents/Marketing-on-local-markets.pdf

7. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, http://agrilife.jrc.ec.europa.eu/documents/SFSChainFinaleditedreport_001.pdf

8. Short Food Supply Chains as drivers of sustainable development, http://www.foodlinkscommunity.net/fileadmin/documents_organicresearch/foodlinks/CoPs/evidence-document-sfsc-cop.pdf

9. High Nature Value Farming in the Yorkshire Dales Buckden parish case study, http://www.yorkshiredales.org.uk/__data/assets/pdf_file/0008/472472/ydnpa-hnv-buckden-case-study-report.pdf

10. Innovations in local food enterprise - Fresh ideas for a just and profitable food system, http://wafarmersmarkets.org/resource-file/Innovations_in_Local_Food_Enterprise_Wallace_Ctr.pdf

Sub theme: Community supported agriculture (CSA) partnership

1. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, http://agrilife.jrc.ec.europa.eu/documents/SFSChainFinaleditedreport_001.pdf

2. Short Food Supply Chains as drivers of sustainable development, http://www.foodlinkscommunity.net/fileadmin/documents_organicresearch/foodlinks/CoPs/evidence-document-sfsc-cop.pdf

3. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences,

http://ec.europa.eu/environment/nature/natura2000/management/docs/FARMING%20FOR%20NATURA%202000-final%20guidance.pdf

4. Innovation in Multiple Networks and Networks of Networks: The Case of the Fruit Sector in Emilia-Romagna, http://centmapress.ilb.uni-bonn.de/ojs/index.php/fsd/article/view/336/269
5. Overview of Community supported agriculture in Europe, http://groupedebruges.eu/sites/default/files/publications/downloads/overview-of-community-supported-agriculture-in-europe-final.pdf
6. http://groupedebruges.eu/sites/default/files/publications/downloads/overview-of-community-supported-agriculture-in-europe-final.pdf
7. Community supported agriculture in Romania Is it driven by economy or solidarity? https://www.iamo.de/fileadmin/documents/dp144.pdf
8. Community Supported Agriculture: An overview of characteristics, diffusion and political interaction in France, Germany, Belgium and Switzerland , http://www.agronauten.net/wp-content/uploads/2014/03/Community-Supported-Agriculture-An-overview-of-characteristics-diffusion-and-political-interaction-in-France-Germany-Belgium-and-Switzerland.pdf
9. Learning our way towards a sustainable agri-food system. Three cases from Sweden: Stockholm Farmers market, Ramsjö Community Supported Agriculture and Järna Initiative for Local Production, http://orgprints.org/2838/1/ekolantbruk38.pdf
10. Applying 'fair trade' to British upland agriculture, http://insight.cumbria.ac.uk/2227/8/Mansfield_ApplyingFairTradeToBritish.pdf

4.8 References

Akeroyd, J.R., Page, J.N. (2011). Conservation of High Nature Value (HNV) grassland in a farmed landscape in Transylvania, Romania in Contributii Botanice XLVI, 57–71.

Bernués A., Ripoll G., Panea, B. (2012). Consumer segmentation based on convenience orientation and attitudes towards quality attributes of lamb meat, Food Quality and Preference, Volume 26, Issue 2, December 2012, Pages 211–220

Birhala, B., J Moellers (2014). Community supported agriculture in Romania. Solidarity partnerships as viable innovations for small farms? EAAE congress 2014, Ljubljana, August 2014

Blanc, J., Rouéb, M. (2005). Les agneaux de parcours. Rencontres entre producteurs, consommateurs et protecteurs de la nature. Natures Sciences Sociétés, 13(4)

Boons F., Montalvo C., Quist J. and Wagner M. (2013). Sustainable innovation, business models and economic performance: an overview, Journal of Cleaner Production, 45, pp. 1-8,

Carona A., Boisvertb,V., Berthelotc,C., Chambona, P., Gueringer, A., Angeond, V. (2010). Biodiversity conservation as a new rationale for localized and sustainable agro-food systems. The case of two French PDO mountain cheeses, in 9th European IFSA Symposium, 4-7 July 2010,Vienna (Austria)

Darnhofer, I. (2011). Initial Conceptual Framework. FarmPath project, August 2011 (Working document).

Dinis, A. (2006). Marketing and innovation: Useful tools for competitiveness in rural and peripheral areas, European Planning Studies, 14:1, 9-22, DOI: 10.1080/09654310500339083

Draganova M., M. Peneva, Y. Kazakova, Pl. Mishev, C. Gonzalez, T. Pinto Correia, M. Diaz, C. Darrot. (2012). Synthesis report - Cluster 7: High Nature Value Farming.

Dzhabarova, Y., Peneva, M. (2014). Direct Marketing for High Nature Value Products – The Bulgarian Approach, in Turkish Journal of Agricultural and Natural Sciences Special Issue: 2

Freibauer, A., E. Mathijs, G. Brunori, Z. Damianova, E. Faroult, J. Girona i Gomis, L. O´Brien, S. Treyer (2011). Sustainable food consumption and production in a resource-constrained world, EU SCAR Report

Galli F., Brunori G., (eds.) (2013). Short Food Supply Chains as drivers of sustainable development. Evidence Document. Document developed in the framework of the FP7 project FOODLINKS (GA No. 265287). Laboratorio di studi rurali Sismondi, ISBN 978-88-90896-01-9.

Geels, F. (2004). From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. Research Policy 33: 897-920.

Gueringer, A., Orth, D., Balay, C., Landre, F. (2010). Contribution of different farming and forage systems to biodiversity: an example in a PDO cheese area in French mountains., in 9th European IFSA Symposium, 4-7 July 2010, Vienna (Austria)

Iñigo Doria, Ardilatxa K. E. (2015). Innovation in shepherding in the Basque Country, La Cañada - Number 30 Winter 2015

Kazakova, Y., (2012). Evaluation of the Overall implementation, impact and results of BSPB project grant scheme for support of HNV farmers in three Natura 2000 sites in Bulgaria: SPA Ponor, SPA Bessaparski Hills and SPA West Balkan Mountain.

Kazakova, Y., Peneva M., (2015). High Nature Value Farmlands A Strength or a weaskeness to regional development? Case studies from 3 Black Sea countries, in Istanbul Journal of Economics and Politics, special Volume 1, pp 24-36

Kazakova, Y., Peneva M., (2015). Local Food Systems and Rural Development in Bulgaria, in Scientific Journal Warsaw University of Life Sciences – SGGW Problems of World Agriculture volume 15 (XXX), number 4, pp 147–155

Kemp R., Foxon, T., (2007). Innovation impacts of environmental policies, in International Handbook on Environment and Technology Management (ETM), edited by D.Marinova, D. Annandale and J.Phillimore, Edward Elgar, Cheltenham, 119-139.

Kemp, R.; Pearson, P. (2007). Final report of the MEI project measuring eco innovation. UM Merit Maastricht

Kjeldsen Chr., Hugo Fjelsted Alroe (2006). Localness as the new orthodoxy? Critical reflections on localisation of food systems, in Joint Organic Congress, Odense, Denmark, May 30-31, 2006

Kneafsey M., Venn L., Schmutz U., Balázs B., Trenchard L., Wood T., Bos E., Sutton G., Blackett M. (2013). Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics, in JRC Scientific and Policy reports, European Commission

Knickel, Karlheinz, and Henk Renting. (2000). "Methodological and conceptual issues in the study of multifunctionality and rural development." Sociologia ruralis 40.4, p.512-528.

Mansfield L. (2008). The Cumbria Hill Sheep Initiative: a solution to the decline in the Upland Hill Farming Community in England?, In: Robinson G. 'Sustainable Rural Systems – Sustainable Agriculture and Rural Communities', p.161-184, Ashgate: Aldershot

Mansfield L. and Peck Fr. (2013). Applying 'fair trade' to British upland agriculture in Outlook on AGRICULTURE, Vol 42, No 3, September 2013, pp. 163-170(8)

Montalvo, C., (2008). General wisdom concerning the factors affecting the adoption of cleaner technologies: a survey 1990–2007, Journal of Cleaner Production, 16 (1), 2008: S7–S13, http://www.sciencedirect.com/science/article/pii/S0959652607002028

Nill, J., R. Kemp (2009). Evolutionary Approaches for Sustainable Innovation policies: From niche to paradigm?, Research Policy, 38(4): 668-680.

OECD (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition

Pokorny, D. (2008). Conservation by consumption: In situ conservation of agrobiodiversity in the Rhön UNESCO-Biosphere Reserve, Germany. Protected Landscapes and Agrobiodiversity Values. Volume 1 in the series, Protected Landscapes and Seascapes, IUCN & GTZ, 59.

Peneva M., Kazakova-Mateva Y., (2015). Local Food Systems and Rural Development in Bulgaria in Scientific Journal Warsaw Univers Quality of Life Sciences – SGGW Problems of World Agriculture volume 15 (XXX), number 4, 2015: 147–155

Ploeg J. D. v.d. (2000). Revitalizing Agriculture: Farming Economically as Starting Ground for Rural Development. Sociologia Ruralis, 40: 497–511. doi:10.1111/1467-9523.00163

Page, N., R. Popa, C. Gherghiceanu, L. Balint, (2010). Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania, Mountain Hay meadows

Popa, R., (2010). Case Study from Romania - Fundatia ADEPT Transilvania, Saschiz, in Greening the EU Common Agriculture Policy Rural Development initiatives and policy Bled, Slovenia p.57

Popa, R., (2015). Protecting Romania's unique high-biodiversity landscapes and the small-scale farming communities that have created them. Presentation at the Follow up event of the Natura 2000 seminar for the Pannonian, Black Sea and Steppic Regions, Arad, Romania

Renting, H., Marsden T., Banks J. (2003). Understanding Alternative Food Networks: Exploring the Role of Short Food Supply Chains in Rural Development, in Journal Environment and Planning A, vol 35, Issue 3

Robinson, R. (2010). Mountain Development based on cultural and environmental assets in Euromontana SARD-M report on positive externalities 2008-2009

Schonhart et al. (2009). CropRota – A Model to Generate Optimal Crop Rotations from Observed Land Use, in University of Natural Resources and Applied Life Sciences, Vienna, Department of Economics and Social Sciences

Sengenberger, W., & Pyke, F. (1990). Small firm industrial districts and local economic regeneration: research and policy issues, Paper 1 for the International Conference on Industrial Districts and Local Economic Regeneration, International Labour Organization, Geneva

Stanciu, M., Ciortea, G., Blaj R., Sand C., Antonie, I., Todericiu, R., (2012). Conservation of natural resources based on exploitation of local/traditional products, and those important for nature conservation. Journal of Horticulture, Forestry and Biotechnology, 16, p.112-115.

Thumm, U., Raufer B. and Lewandowski I. (2014). Novel products from grassland (bioenergy & biorefinery), EGF proceedings 2014, p.429-437,

Westberg, L., Björklund J., Geber U., & Milestad, R. (2006). The learning potential of farmers market. Changing European farming systems for a better future New visions for rural areas, p.84-88

Winter, M. (2003). Embeddedness, the new food economy and defensive localism. Journal of rural studies, 19(1), p.23-32

Winter, M., (2005). Geographies of food: agro-food geographies – food, nature, farmers and agency, in Progress in Human Geography 29(5):609-617 · October 2005

INNOVATIONS BENEFITING HNV FARMING SYSTEMS, FARMERS AND COMMUNITIES

5 FARMING TECHNIQUES INNOVATIONS

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5 FARMING TECHNIQUES INNOVATIONS

5.1 Framing of the theme

In the farming techniques theme, the focus is technological (including locally adapted techniques) and management (including grazing management and monitoring) innovations that may reduce costs and increase efficiency at the holding level (e.g. adapted machinery; new feeding systems; innovative water efficiency solutions; monitoring systems).

Six main topics (parameters) were defined under the theme of farming techniques and management. These topics were elected based on our team's previous experience and on a brief survey including the docs from the EIP-AGRI Focus Group "HNV farming profitability" and the reports from the "Subgroup on Innovation for agricultural productivity and sustainability" from The European Rural Networks' Assembly:

- Soil management techniques: Soil conservation techniques including conservation tillage, shrub control, conservation and enhancement of soil organic matter
- Crop production: Integrated pest management (IPM), crop diversification, alternative production/farming methods (e.g. organic farming, integrated production, permaculture).
- Livestock management techniques and support tools: Feeding and watering systems and also other livestock related management practices such as fencing, reproduction and health care and also alternative production methods (e.g. organic farming, integrated production).
- Adapted farming machinery: Small scale harvest, on-farm processing units, milking systems, tools and processes both for vegetables and for animals (small scale slaughter and processing machinery).
- Monitoring and data processing tools to support decision making: Monitoring at landscape level (remote sensing); monitoring at farm level (pastures, grazing animals, biodiversity); tools and procedures for combining field level data (collected and managed using sensor networks and/or "internet of things") with remote sensing data; data collection and storage tools; New technologies for management, precision farming, use of mobile apps (e.g. animal identification, animal health care, animal feeding, animal reproduction, crop development, pest management)
- Whole-farm and landscape-level management: Management focused on a territorial approach which is important in the context of HNV and practices to retain the HNV character (e.g. non-cropped areas, management of rare species and designated habitats, green corridors, landscape connectivity).

5.2 Particular features of the literature review methodology

For each of the six main topics (see section 1) defined within the Farming technique and Management Innovation theme, specific keywords to be used in the search of literature, were identified.

As HNV farming systems vary greatly, it was decided to frame our literature review process working with the HNV farming systems typology used in the EIP-AGRI Focus Group – HNV farming profitability:

- Livestock dominated production systems;
- Arable dominated production systems;
- Permanent crop dominated production systems;
- Mixed production systems and mosaic HNV landscapes

A matrix of keywords, considering both the main topics (section 1) and the types of HNV farming systems (Livestock, arable, permanent crop and mixed and mosaic dominated production systems) was constructed and further refined. Search terms were identified for the collection of references (Table 4.1).

Table 4.1. The search terms used for Farming techniques and management.

Search terms	Number of returns	Filter	Final results	Results considered relevant for HNV systems
“livestock” and “soil management” and “Conservation agriculture*”	2030	hnv	8	3
“livestock” and “soil management” and “Conservation Tillage*”	3580	hnv	9	2
“livestock” and “soil management” and “Shrub control*”	15	hnv	2	-
“livestock” and “soil management” and “Organic matter enhancement*”	11		11	1
“livestock” and “livestock management” and “sustainable livestock*”	814	hnv	6	1
“livestock” and “livestock management” and “feeding system*”	541	hnv	3	-
“livestock” and “livestock management” and “watering system*”	62	hnv	0	
“livestock” and “livestock management” and “watering system*”	62	innovation	13	1
“livestock” and “livestock management” and “healthcare*”	909	hnv	3	-
“livestock” and “livestock management” and “best practice*”	985	hnv	10	1
“livestock” and “livestock management” and “organic farming*”	1320	hnv	24	2

“livestock” and “livestock management” and “precision farming*”	281	hnv	1	-
“livestock” and “livestock management” and “precision farming*”	281	innovation	117	1
“livestock” and “adapted machinery” and “small scale slaughter”	0		0	
“livestock” and “adapted machinery”	52	hnv	1	-
“livestock” and “adapted machinery”	52	innovation	27	-
“livestock” and “Small scale processing”	1210	hnv	2	-
“livestock” and “Small scale” and "innovation"	19800	hnv	99	2
“livestock” and “adapted machinery” and “mobile machinery”	0		0	
“livestock” and "Monitoring tools" and “remote sensing*”	422	hnv	4	-
“livestock” and "Monitoring tools" and “remote sensing*”	422	innovation	116	1
“livestock” and "Monitoring tools" and “virtual fencing*”	6		6	3
“livestock” and "Monitoring tools" and “virtual fencing*”	6	hnv	0	
“livestock” and "Monitoring tools" and “profitability assessment*”	5	hnv	0	-
“livestock” and "Monitoring tools" and “mobile apps*”	5	hnv	0	
“livestock” and "Monitoring tools" and “landscape level*”	127	hnv	1	-
“livestock” and "Monitoring tools" and “farm level*”	208	hnv	2	-
“arable” and “soil management” and “Conservation Tillage*”	4140	hnv	10	-
“arable” and “soil management” and “Shrub control*”	7	hnv	2	2
“arable” and “soil management” and “Organic matter enhancement*”	10	hnv	0	
“arable” and “crop production” and “integrated pest management*”	4270	hnv and innovation	10	2

“arable” and “crop production” and “diversification*”	3400	hnv and innovation	38	-
“arable” and “crop production” and “organic farming*”	8960	hnv and innovation	42	2
“arable” and “crop production” and “precision farming*”	1590	hnv and innovation	7	2
“arable” and “monitoring tools” and “sensors*”	105	hnv	0	-
“arable” and “monitoring tools” and “profitability assessment*”	4	hnv	0	-
“arable” and “monitoring tools” and “mobile apps*”	2	hnv	0	1
“permanent crop” and “soil management” and “organic matter enhancement*”	1	hnv	0	-
“permanent crop” and "crop production" and "integrated pest management"	83	hnv	3	-
“permanent crop” and "crop production" and "organic farming"	150	hnv	10	-
“permanent crop” and "crop production" and "precision farming"	38	hnv	2	-
“permanent crop” and "small scale harvest"	0		0	-
“permanent crop” and "small scale processing"	5	hnv	0	-
“permanent crop” and "mobile machinery"	3	hnv	0	
“mosaic*” and “soil management” and “Conservation agriculture*”	193		193	3
“mosaic” and “soil management” and “Shrub control*”	7		7	2
“mosaic” and “soil management” and “organic matter enhancement*”	3		3	1
“mosaic” and “livestock management” and “sustainable livestock*”	73	hnv	3	1
“mosaic” and “livestock management” and “feeding system*”	15		15	3

“mosaic” and “livestock management” and “watering system*”	2		2	1
“mosaic” and “livestock management” and “healthcare*”	42		42	1
“mosaic” and “livestock management” and “best practice*”	98	hnv	3	-
“mosaic” and “livestock management” and “organic farming*”	126	hnv	9	-
“mosaic” and “livestock management” and “precision farming*”	29	hnv	0	-
“Landscape*” and “diversification*”	104000	Hnv and innovation	125	1
“Landscape*” and “Non-cropped areas*”	270	hnv and innovation	6	
“Landscape*” and “green corridors*”	3820	hnv	10	
“Landscape*” and “buffer strips*”	12200	hnv and innovation	31	
“landscape connectivity*”	13100	hnv and innovation	7	
"farming techniques"	18400	hnv and innovation	22	2

* indicates inclusion of all endings of given search term. Google does this automatically but other search engines may not. Note that different search engines may require a different symbol.

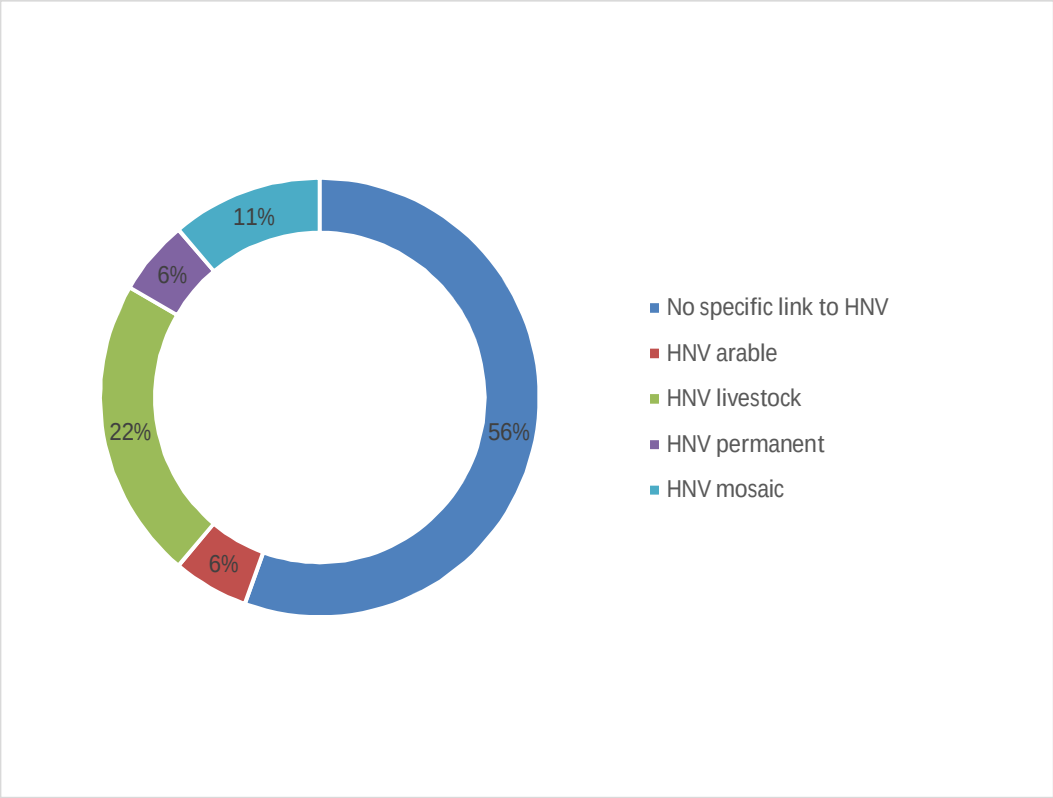
5.3 Summary of main results of the literature review for this theme

Farming techniques and management is a broad theme as evidenced by the six topics that were identified in section 1 which include practices and technologies related to the different “layers” of the system (soil, plants and animals), technological solutions mainly related to farm machinery and management options and related tools.

Nevertheless, it was somewhat difficult to find clear examples of innovations within the different sub-themes of farming techniques and management. This difficulty was not completely unexpected. Innovations may sprout from farming practice itself or they may emerge from focused research efforts. Either way, innovations for end users are not often covered in the scientific literature (Mallast et al, 2014) and particularly for HNV systems which are generally associated to the maintenance of certain low intensity traditional practices and a low level of application of production factors (except for labor).

In the literature search performed on google scholar, from a universe of about 1067 hits that were found as the result of the combination of search terms (Table 4.1), only about 42 were identified as relevant for the theme of innovation on farming techniques and management. Within those, more than half were not specifically linked to HNV farming systems but were judged as applicable to such systems, particularly to HNV livestock systems. The next larger share was for HNV livestock systems (22%) being the three other HNV systems the ones with a smaller number of examples of identified innovation examples under farming techniques and management (Figure 5.1).

Figure 5.1. Literature review results per Innovation theme and per HNV system.



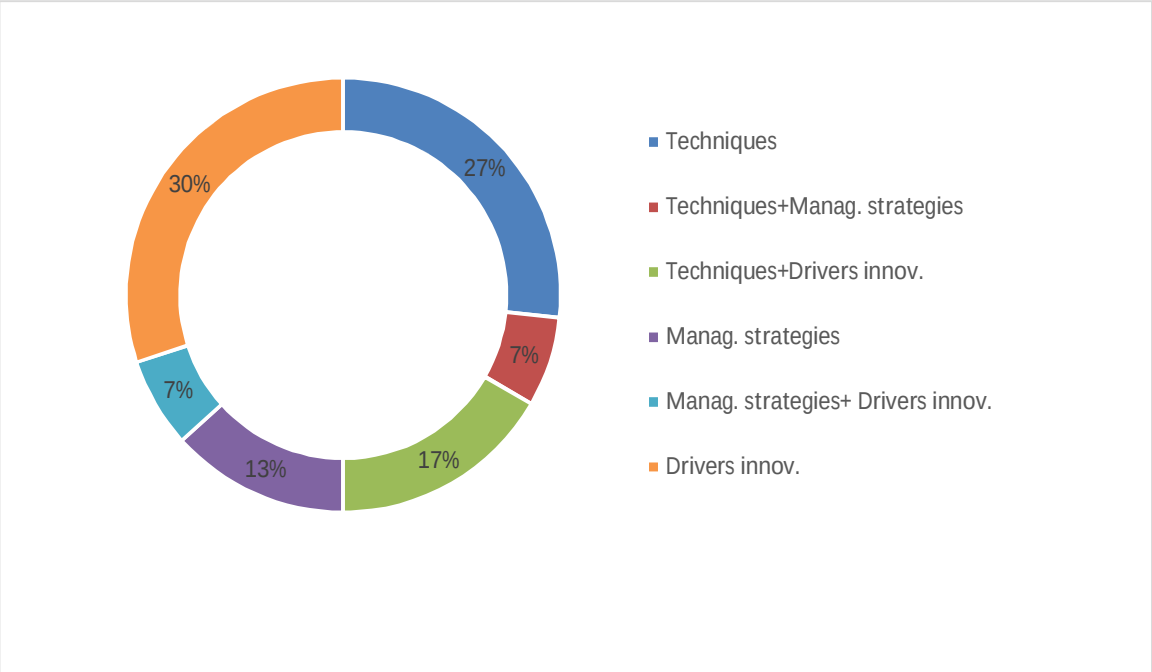
Most references identified within farming techniques and management innovation theme relate to case studies where reports and or analysis of different management approaches are presented. Furthermore, reports where techniques and also best practices which are not exactly innovative, are suggested for particular situations, were here considered also as “examples of innovations”.

As the Farming techniques and management theme is a very broad one, where as previously referred, the reports of innovations within HNV systems are not very evident, we decided to “classify” the references where innovations were identified (within the HNV-excel file (column P)) in the following groups:

- Techniques: technological procedures and/or devices and/or solutions.
- Management strategies: best practices, management solutions at the holding level and/or landscape level
- Driving forces/drivers for innovation in farming techniques and management: this group include references that describe and/or analyze conditions and environments that facilitate or may lead to innovations on farming techniques and management

The three groups are not mutual exclusive and up to now the share of papers reviewed, classified under each group is presented in Figure 5.2. The groups which include references classified as "driving forces for innovation" sum up about half of the papers reviewed. Such studies are not clear examples of innovation that can be replicated in different locations or environments, but rather analyze conditions that may lead to innovations. Examples grouped under management strategies and under techniques, are more likely to be useful for end users as transferable examples of innovations that may benefit both the natural values and the viability of HNV farming.

Figure 5.2. Share of papers reviewed in different types of innovations in farming techniques and management.



5.4 Examples of existing innovations

SUB-THEME: LIVESTOCK MANAGEMENT TECHNIQUES AND SUPPORT TOOLS

Short description of the innovation:	Development and implementation of practical, local solutions to management problems aiming to encourage and support the grazing of winterages at The Burren. These include facilitating livestock movement and herding around sites, increasing water availability and

	restoring internal stone walls and introducing a new grazing and feeding system.
Related themes/concepts/key words:	Sustainable grazing management; Feeding system; Feed supplements;

Examples of innovative use of livestock management techniques:

HNV system concerned:	HNV livestock systems
What is the innovation:	Tailored grazing and feeding system (main innovation)
What stage of the process is it in:	Full development

beginning <-> full development

The innovation includes the two components of livestock feeding system on The burren – grazing and supplementary feed.
Grazing system: A 'grazing days' system has been designed that has a targeted outcome. A grazing day is one livestock unit/day and the number of grazing days is calculated for a winterage based on the area, forage quality and previous grazing levels. Grazing at target levels minimises feed costs, maximises forage usage and affords greater flexibility.

Supplementary feed during winterage: Suckler cows at late pregnancy use to be supplemented with silage, resulting in reduced use of the winterages and increased point-source pollution (around feeders). The BurrenLIFE Project has encouraged farmers to replace silage with concentrate feed and formulated a BurrenLIFE concentrate which provides the extra protein and energy needed, as well as the full recommended daily allowance of vitamins and minerals.

Who initiated and who joined/followed?

The innovation was initiated by the Burren LIFE project which was a partnership between the National Parks and Wild-life Service, Teagasc (the Agriculture and Food Development Authority) and the Burren Irish Farmers Association and involving twenty 'monitor' farms covering more than 3,000ha of farmland.

Identified enabling conditions or success factors

The Burren LIFE project itself. Other important factors in the success of the iniciatives, including the described innovation in BurrenLIFE Project include involving the local community through ongoing liaison work, having a central office location, promoting the work of the project, taking a multi-disciplinary approach (i.e. ecology, agriculture and socio-economics) and forming working relationships with all relevant stakeholders involved: farmers, researchers, and conservation and agricultural authorities.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

It is beneficial in that the innovative grazing and feeding management is beneficial to the natural value and heritage and increases the viability of farming in the region.

Source: Williams B, Parr S, Moran J, Dunford B, & Ó Conchúir R (2009). The Burren – farming for the future of the fertile rock. Burren LIFE Project. British Wildlife 21(1): 1-9

SUB-THEME: SOIL MANAGEMENT TECHNIQUES

Short description of the innovation:	Assessing practices that are expected to contribute to improving soil quality. Commonly recognized examples are reduced tillage, the application of organic inputs (manures, composts), crop rotation, the cultivation of green manures and catch and cover crops, the retention of crop residues on the field, and the use of low-impact machinery. Besides assessing the biophysical merits of these practices, the Catch-C project identifies barriers against the adoption of better practices. The practices are not seen as innovative themselves, but their application in each context is seen as so.
Related themes/concepts/key words:	Soil management techniques; Conservation agriculture; Enhancement of soil organic matter;

Examples of <u>innovative use</u> of soil management techniques:

HNV system concerned:	Not specific HNV but can be applied to all HNV systems
What is the innovation:	Innovations within the present context are assemblies of ideas, instruments, procedures, tips and tricks, that enable the adoption of better soil management practices.
What stage of the process is it in:	Initiated, running for full development ?

beginning <-> full development

A large number of "fact sheets" of examples of innovations on soil management practices distributed under 7 categories (Rotation, grassland management, tillage, nutrient management, crop protection, water management and others) is reported. The innovations described cover a wide variety of European countries and farming systems. Some practices may be well established in one region, but still innovative in another, and therefore, the purpose is to make locally developed ideas and techniques accessible to a wider European audience, in order to facilitate better soil management.

Who initiated and who joined/followed?

The inniciative to assemble the "fact sheets" of innovations on soil management practices in European farming systems was of a FP7 European project – Catch-C: Compatibility of Agricultural

Management Practices and Types of Farming in the EU to enhance Climate Change Mitigation and Soil Health.

Identified enabling conditions or success factors

The dissemination of the reported experiences of innovations on soil management practices to other European countries and other farming systems.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

Although the innovations are not described specifically for HNV systems, they can be applied to HNV system with benefits for soil quality both in terms of organic matter content and fertility. The improvements in soil quality are likely to result in increasing incomes for HNV farmers.

Source: *Mallast, J., Rühlmann, J., Verhagen, J., & Berge, H. ten. (2014). Compatibility of Agricultural Management Practices and Types of Farming in the EU to enhance Climate Change Mitigation and Soil Health: Overview of technological innovations in soil management. Retrieved from http://www.catch-c.eu/deliverables/D4.451_Innovation_deliv4.5_2209.pdf*

SUB-THEME: MONITORING AND DATA PROCESSING TOOLS TO SUPPORT DECISION MAKING

Short description of the innovation:	A geolocation and monitoring platform oriented to extensive cattle farming in mountain environments. The proposed solution is composed of low power long range communication geolocation devices and a dedicated interface, accessible by means of different portable devices, which allows users to access and study the collected data.
Related themes/concepts/key words:	Monitoring tools; Livestock management; Animal behaviour; Mobile devices;

Examples of innovative use of monitoring and data processing tools:

HNV system concerned:	Not specific HNV but can be applied to HNV livestock systems
What is the innovation:	A geolocation and monitoring platform oriented to extensive cattle farming in mountain environments.
What stage of the process is it in:	beginning

Who initiated and who joined/followed?

The innovation is put forward in a scientific paper by a group of scientists.

Identified enabling conditions or success factors

The adoption of the geolocation system by the end users (farmers) depends on a number of factors, namely: the perception of the real utility of the purposed innovation, the impression that the purposed technology accomplishes its own (farmer's) objectives and the farmer positive vision of new technologies.

Identified gaps and/or limiting factors

Access to the technology and necessary devices. Further identified constraints are wireless network cover in the field and communication network architecture.

Benefits to HNV farming systems, farmers and communities:

Describe explicitly how this is beneficial to HNV systems according to literature; if such info is not presented; explain how and when it will be beneficial to HNV farming.

A geolocation system for extensive cattle farming enables monitoring animal behaviour and therefore improve animal management and wealfare and also farming working conditions for HNV farmers.

Source: *Llaria, A., Terrasson, G., Arregui, H., & Hacala, A. (2015). Geolocation and monitoring platform for extensive farming in mountain pastures. In 2015 IEEE International Conference on Industrial Technology (ICIT) (pp. 2420–2425). IEEE. http://doi.org/10.1109/ICIT.2015.7125454*

5.5 Key findings from the review on HNV farming techniques and management innovations

Most findings/examples of innovations on farming techniques and management identified under the present review are not specifically linked to HNV systems (Figure 5.1), however those findings are potentially useful for HNV systems in order to improve their socio-economic viability while maintaining or improving their nature value.

Techniques (technological procedures and/or devices and/or solutions)

An extensive selection of farming techniques and technologies for climate change adaptation in the agriculture sector particularly directed to developing countries is presented in a guidebook by Clemens et al. (2011). The technologies presented, which are based primarily on the principles of agroecology, are not always innovative but their application in different situations may be so. Technologies covered are: Planning for climate change and variability; Sustainable water use and management; Soil management; Sustainable crop management; Sustainable livestock management; Sustainable farming systems; Capacity building and stakeholder organization. Other authors (Mallast et al., 2014) also list examples of innovations on soil management techniques with the objective of improving soil quality. In this reference soil management techniques are classified under 7 categories - Rotation, grassland management, tillage, nutrient management, crop protection, water management and others – and the examples presented as "fact sheets", are disseminated to a wide audience of European countries.

Soil management techniques focused in the fact sheets are not considered the main innovations by the authors but rather the assemblies of ideas, instruments, procedures, tips and tricks that enable the adoption of better soil management practices.

The use of sensors and information technology tools, that enable the collection and communication of information (monitoring) on crops (Baldock et al., 2010), swards (Schellberg et al., 2008) and animals (Swain et al., 2011; Molle et al., 2008; Bocquier et al., 2014), in order to promote a tailored intervention are identified as important innovative techniques in the literature. Furthermore, sensors information coupled with geolocation systems, using for example global position systems (GPS) enables tracking animals (Swain et al., 2011), not only to improve farming working conditions, but also to better understand the behavior of animals (Llaria et al., 2015). In the same line Woodill and Udell (2012) present an inventory of mobile apps available for different farming activities/areas (e.g. Agriculture Information Apps, Diseases and Pests Apps, Farm Management Apps, Field Mapping Apps, Learning and Reference Apps, Weather App). Examples of these technologies use in HNV farming systems were not identified, however the use of precision agriculture principles and technologies for promoting conservation agriculture is evaluated by Basso (2003). This publication further discusses the perspectives of using precision agriculture techniques, particularly for mosaic agricultural systems.

Management strategies (best practices and/or management solutions at the holding level and/or landscape level)

Valentine et al. (2008) assess the impact of land management options (in Asian countries) on soil erosion rates (these included tree plantations, fruit trees, improved fallow with legumes, maize intercropped with legumes, planted fodder, native grass strips and agro-ecological practices). After analyzing the impact of each management option on the soil erosion rates the authors conclude that a failure to adopt appropriate land use management strategies will result in further rapid resource degradation with negative impacts to downstream communities. Other authors also evaluate the effect of alternative soil management options (no tillage) on the establishment and persistence of soil fungal communities of utmost importance in semi-natural agro-forest ecosystems concluding that soil tillage can result in a decrease in mycorrhizal taxa even a long time after disturbances have taken place.

Management of low-input, pasture-based farming systems in the European Mediterranean Basin are discussed and options for designing and implementing more sustainable systems under very uncertain conditions, are put forward (Bernués et al., 2011). Duru and Hubert (2003) further suggest a conceptual model that can be used to design a set of grazing management practices suited to a diversity of specifications. It involves a combination of defoliation and fertiliser practices, allowing different targets (herbage yield, composition and grassland biodiversity) to be achieved. At a more landscape approach level, a report from the Grain and Graze project (Australia) aiming at improving farm profit and environmental health through a holistic approach to whole-farm vegetation management, deals with issues such as deciding the appropriate balance between livestock and crops, designing farming systems that cope with variability, finding better ways to manage the complexity of modern farming, and understanding how to keep farms and their rural landscapes healthy and productive. A more applied and practical example of innovation is described by Williams et al. (2009) at the Burren in Ireland. The development and implementation of local innovative solutions for management problems include practical solutions for facilitating livestock movement and herding around sites, increasing water availability, restoring internal stone walls and introducing a new grazing and feeding systems.

Driving forces for innovation or conditions that facilitate innovation in farming techniques and management

These are mostly studies and analysis that compare and or characterize different management approaches (Ripoll-Bosch et al, 2013) or different attitudes from managers (Barroso et al, 2012; Moreno et al, 2014) and its eventual positive impacts on the agricultural systems in study. Accounting for gmultifunctionality in HNV farming systems could increase economic profitability. New functions considered in silvo-pastoral systems (for example Montado, particularly) include: bioenergy, carbon sequestration, control of nutrient leaching, halting of biodiversity loss and recreational uses (Moreno et al., 2014). To cope with these new functions, there is a need of innovative techniques and specific policy measures to solve threats and reinforce their social and ecological roles.

The Technology Innovation Platform of the *International Federation of Organic Agriculture Movements* - IFOAM (TIPI) (Niggli et al., 2016) is also an important example of a driving force for innovation on farming techniques devoted to organic agriculture. TIPI has developed a vision and an agenda to advance organic agriculture through research, development, innovation and technology transfer. The new paradigm proposed by TIPI is founded on a holistic and systemic approach and it involves engaging farmers, researchers and other practitioners in co-innovative processes and developing open access technologies that can be readily adapted to local conditions.

Limiting factors

A snapshot of the main identified barriers and limitations to the realization of farming techniques and management innovations:

- Farmers' perception of the real utility of the innovation
- Legal context of the purposed innovation
- Technical or agro-ecological difficulties associated with the introduction of the innovation, meaning practical barriers.

5.6 Recommendations to the Learning Areas for the identification and description of innovations in farming techniques and management

In some combinations of search terms used for the literature review, although a significant number of hits were registered, no relevant references of innovation on farming techniques and management, were identified. This might be the result of absence of innovations reported and described within that particular field or it might be a result of the use of "inappropriate" keywords. In the first case, the absence of reported innovations as such could be due to the fact that processes of "soft" innovation (or "hidden innovation") as described by Madureira et al. (2013) are not identified as innovations on farming techniques and management. Although these processes (which rely mostly on the role of human resources, interactions with markets and building of networks (Madureira et al., 2013)) contribute to the development of innovative production methods, they are not identified as farming techniques and management innovations. Therefore the integration of the various dimensions of innovation (Markets and products, Farming techniques and management, social and institutional and regulatory framework) within the HNV systems is crucial for the identification of innovation examples and also gaps within these systems. This integration will probably be easier to achieve within the LA grassroots learning process.

APPENDIX 1: LIST OF SOURCES REVIEWED UNDER EACH INNOVATION THEME

1. Literature reviewed on the Social and Institutional theme

Barroso, F., Menezes H. & Pinto-Correia, T. Multifunctional transition pathways: How are multi-stakeholder's influencing land management farm systems resilience? Case study of Mediterranean agro-forestry systems In South Portugal.

Bentley, J.W. 1994. Facts, Fantasies, And Failures Of Farmer Participatory Research. Agriculture and Human Values, Spring-Summer 1994.

Bignal, E. & Jones, G. (editors). 2007. Community initatives for grassland conservation in the Lower Wye Valley, UK. La Cañada, 21.

Bowena, S. & De Masterb, K. 2011. New rural livelihoods or museums of production? Quality food initiatives in practice. Journal of Rural Studies, 27, 73–82.

Browna, P., Hart, G., Small, B. & Montes de Oca Munguia, O. 2016. Agents for diffusion of agricultural innovations for environmental outcomes. Land Use Policy 55, 318-326.

Caballero, V. & Fernández-Santos, X. 2009. Grazing institutions in Castilla-La Mancha, dynamic or downward trend in the Spanish cereal–sheep system. Agricultural Systems 101, 69–79.

Dinu, C. Helping to Adapt? NGOs Influence on the Resilience of a Cultural Landscape from Transylvania, Romania - A Comparative Analysis. Master thesis-Utrecht University.

European Commission. 2014. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences. European Commission.

Fundația ADEPT Transilvania. 2016. Rural Development and High Nature Value Farmland in Romania (project broshure). Fundația ADEPT Transilvania.

IFOAM-EU GROUP. 2014. Implementing innovative ecological solutions for farmers and rural communities. Proceedings of the 8th European Organic Congress, Bari, Italy, 2014.

Kaloxylos, A., Groumas, A., Sarris, V., Katsikas, L., Magdalinos, P., Wolfert, S., Antoniou, E., Brewster, C., Politopoulou, Z., Eigenmann, R. & Maestre Terol, C. 2014. A cloud-based Farm Management System: Architecture and implementation. Computers and Electronics in Agriculture 100, 168–179.

Markelovaa, H., Meinzen-Dicka, R., Hellinb, J. & Dohrna, S. 2009. Collective action for smallholder market access. Food Policy, 34, 1–7.

Organic Research Center. Organic Knowledge Network Arable. Organic Research Center.

Peneva, M., Draganova, M., Gonzalez, C., Diaz, A. & Mishev, P. 2015. High nature value farming: environmental practices for rural sustainability. Chapter 7 in the book "Transition pathways towards sustaibability in agriculture".

Peters, R. (Managing Editor). 2014. WHERE RESEARCH AND PRACTICE MEET. Agrinnovation Magazine.

Pinto-Correia, T. 2011. Capitalizing on public goods provision for the management of fragile agricultural systems: differentiation in innovation capacity of land managers in the face of conflicting policy regimes. Conference proceedings 2011.

Warchalska-Troll, A. & Troll, M. 2014. Summer Livestock Farming at the Crossroads in the Ukrainian Carpathians.The Unique Case of the Chornohora Mountain Range. Mountain Research and Development 34, 344-355.

Warchalska-Troll, A. & Troll, M. 2014. Summer Livestock Farming at the Crossroads in the Ukrainian Carpathians. The Unique Case of the Chornohora Mountain Range. Mountain Research and Development 34, 344-355.

Winter, M. 2006. Rescaling rurality: Multilevel governance of the agro-food sector. Political Geography, 25, 735-751.

Wolfert, J., Schoorlemmer, H.B., Paree, P.G.A., Zunneberg, W. & van Hoven, J.P.C. 2005. KodA: from knowledge to practice for Dutch arable farming. EFITA/WCCA 2005, Joint Congress on IT in agriculture, Portugal.

2. Literature reviewed on the Regulatory Framework theme

Aragrande, M., Gentile, E., Bruni, M., Loi, A., Amore, F., Micalella, T., Chemin Palma, M., Bradley, D., Nganga, J., Marechal, A., Zucconi, S., Oudin, B., Woerner, G., Robles Robles, R. & Thorsted Hamann, K. 2013. Study on assessing the added value of PDO/PGI products. European Commission report.

Arnalte-Alegre, E. & Ortiz-Miranda, D. Chapter 3 The 'Southern Model' of European Agriculture Revisited: Continuities and Dynamics. Book Series: Research in Rural Sociology and Development Series ISSN: 1057-1922. Series editor(s): Professor Terry Marsden.

Baldock, D., Bureau, J. C., Butault, J. P., Cooper, T., Delame, N., Erjavec, E., & Matthews, A. 2011. The single payment scheme after 2013: new approach, new targets. European Parliament Report.

Baltussen,W., Jongeneel,R., van Horne,P., Helming, J. & Dewar, D. 2013. Study on mandatory origin labelling for pig, poultry and sheep & goat meat. Report for LEI Agricultural Economics Research Institute, Wageningen.

Beaufoy, G. and Poux, X. 2014. Supporting HNV extensive livestock systems in Mountain and Mediterranean areas–The need for an adapted European Policy. Options Méditerranéennes.

Beaufoy, G. 2007. EU labelling of geographical origin: good, bad or irrelevant for HNV farming? La Canada, 21.

Beaufoy, G., Cebrian Calvo, E., Hoogeveen, Y. and Petersen, J.E. Distribution and targeting of the CAP budget from a biodiversity perspective. EEA Technical Report.

Beiglböck, S., Schuh, B., Fleury, P., Noury, J.M. & Novak, S. Co-operation Patterns and Networks in Rural Areas (Synopsis Report). Teresa.

Bignal, E. & Jones, G. (editors). 2007. EU labelling of geographical origin: good, bad or irrelevant for HNV farming? La Cañada – Number 21 Winter 2007.

Bignal, E.M. & McCracken, D. The nature conservation value of European traditional farming systems. Environmental Reviews.

Bignal, E.M. 1998. Using an ecological understanding of farmland to reconcile nature conservation requirements, EU agriculture policy and world trade agreements. Journal of Ecology, 35, 949–954.

Bijman, J., Iliopoulos, C., Poppe, K. J., Gijselinckx, C., Hagedorn, K., Hanisch, M., Hendrikse, G., Kuhl, R., Olilla, P., Pyykkonen, P. & van der Sangen, G. 2012. Support for farmers' cooperatives. European Commission report.

Boyle, P., Hayes, M., Gormally, M., Sullivan, C. & Moran, J. 2015. Development of a nature value index for pastoral farmland—A rapid farm-level assessment. Ecological Indicators, 56, 31-40.

Caggiano, M. 2014. AKIS and advisory services in The Netherlands Report for the AKIS inventory (WP3) of the PRO AKIS project. 2014 French National Institute for Agricultural Research (INRA).

Carlier, L., Rotar, I. & Vidican, R. 2010. The EU Policy Regulates and Controls the Farming Practices. Bulletin UASVM Agriculture, 67.

Chever, T., Renault, C., Renault, S., & Romieu, V. 2012. Value of production of agricultural products and foodstuffs, wines, aromatised wines and spirits protected by a geographical indication (GI). European Commission report.

Cooper, T., Arblaster, K., Baldock, D., Farmer, M., Beaufoy, G., Jones, G., ... & Wascher, D. 2007. Final report for the study on HNV indicators for evaluation. European Network for Rural Development.

Cooper, T., Arblaster, K., Baldock, D., Farmer, M., Beaufoy, G., Jones, G.,& Wascher, D. 2007. Final report for the study on HNV indicators for evaluation. IEEP report.

Cooper, T., Hart, K., & Baldock, D. 2009. Provision of public goods through agriculture in the European Union. IEEP report.

Darnhofer, I. & Schneeberger, W. 2007. Impacts of voluntary agri-environmental measures on Austria's agriculture. International Journal of Agricultural Resources, Governance and Ecology.

Díez-Unquera, B. Affiliated with Neiker Tecnalia, Ripoll-Bosch, R., Ruiz, R., Villalba, D., Molina, E., Joy, M., Olaizola, A. & Bernués, A. Indicators of sustainability in pasture-based livestock systems. Animal farming and environmental interactions in the Mediterranean region, Volume 131 of the series EAAP – European Federation of Animal Sciences pp 129-137.

Donald, P. F., Pisano, G., Rayment, M. D. & Pain, D. J. 2002. The Common Agricultural Policy, EU enlargement and the conservation of Europe's farmland birds. Agriculture, Ecosystems and Environment, 89, 167–182.

Dwyer, J., Clark, M., Kirwan, J., Kambites, C., Lewis, N., Molnarova, A., ... & Bolli, M. 2008. Review of Rural Development Instruments: DG Agri project 2006-G4-10. Final Report. European Commission report.

Dwyer, J., Ilbery, B., Kubinakova, K., Buckwell, A., Menadue, H., Hart, K., Knickel, K., Mantino, F. & Erjavec, E. 2012. How to improve the sustainable competitiveness and innovation in the EU agricultural sector. A study requested by the European Parliament's Committee on Agriculture.

ECORYS and IDEA Consult. Impact analysis: study on baseline and impact indicators for rural development programming 2007-2013. European Commission report.

ECORYS and IDEA Consult. Indicators for the Evaluation of the EU's Rural Development Programmes. Task 1 to 5. European Commission report.

ECORYS Nederland BV in cooperation with ÖIR, EC OTEC, IDEA Consult and CRE. Study on employment, growth and innovation in rural areas (SEGIRA). European Commission report.

EEA. 2004. High Nature Value farmland: Characteristics, trends and policy challenges. EEA Technical Report.

EEA. 2009. EEA Signals 2009 - Key environmental issues facing Europe. EEA Technical Report.

Elbersen, B., van Doorn, A., Naeff, H. Territorial distribution of CAP payments in the Netherlands and present and future environmental policy targets. Alterra.

Eriksen, J.P., Gabrielsen, P. & Jacobsen, C. 2006. EEA Report 2/2006 - Integration of environment into EU agriculture policy - the IRENA indicator-based assessment report. EEA Technical Report.

European Commission. 2007. Study to assess the administrative burden on farms arising from the CAP-Final report. European Commission report.

Fry, J., Hochstrasser, T., Gonzalez, A., Whelan, J., Scott, P., Carvill, P. & Jones, M. 2016. General Biodiversity Impact Assessment in Strategic Environmental Assessment: Addressing a neglected area. UCD.

GFA Consulting Group. 2006. Analysis of the requirements for soil and biodiversity protection as well as for Greenhouse Gas mitigation within the Rural Development Programmes. European Commission report.

Henle et al. 2008. Identifying and managing the conflicts between agriculture and biodiversity conservation in Europe–A review. Agriculture, Ecosystems and Environment 124, 60-71.

Herzog, F., Balazs, K., Dennis, P., Friedel, J., Geijzendorffer, I., Jeanneret, P., Kainz, M. & Pointereau, P. 2012. Farmland biodiversity indicators in Europe. BioBio report.

Jack, B. 2006. The European Community and Biodiversity Loss: Missing the Target? Review of European Community & International Environmental Law.

Jansson, K. M., & Terluin, I. J. 2009. Alternative futures of rural areas in the EU. Policy-Supporting Research BO-01-009 within the framework of programmes for the Dutch Ministry of Agriculture,Nature and Food Quality.

Keenleyside, C., Beaufoy, G., Tucker, G., & Jones, G. 2014. The High Nature Value farming concept throughout EU 27 and its maturity for financial support under the CAP. IEEP report.

Krautzer, B., Bartel, A., Kirmer, A., Tischew, S., Feucht, B., Wieden, M. & Pötsch, E. M. Establishment and use of High Nature Value farmland. Proceedings of the 16th Symposium of the European Grassland Federation.

Kuhlmann. T., Verhoog, D., Verkerk, H., Lindner, M., Kaae, B., Hasler, B., Sick Nielsen, T., Casperson, H.O., Jansson, T. Land Use Policy Scenarios in six Target Sectors. Sensor.

Kukreja, R. (editor), Kölling, A. (supervision), Kölling, A., Stopes, C. & Schlüter, M. (Scientific and political advice). 2010. Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to Mediterranean Regions. Presented on the occasion of the Conference titled "Biodiversity and Organic farming – a win-win partnership" on 18th November 2010 at the European Parliament in Brussels.

Leip, A., Weiss, F., Wassenaar, T., Perez, I., Fellmann, T., Loudjani, P., ... & Biala, K. Evaluation of the livestock sector's contribution to the EU greenhouse gas emissions (GGELS)–final report. JRC policy and scientific report. AEA Energy & Environment and Universidad de Politécnica de Madrid. Adaptation to Climate Change in the Agricultural Sector, Report to European Commission Directorate–General for Agriculture and Rural Development. European Commission report.

Leonie, S. EU Biodiversity policy: an effective approach to combating biodiversity loss in Europe? Bachelor Thesis.

Matthews, A. 2011. Post-2013 EU Common Agricultural Policy, Trade and Development. A Review of Legislative Proposals. International Centre for Programme on Agricultural Trade and Sustainable Development (ICTSD).

McCracken, D. & Huband, S. 2005. Nature Conservation Value of European Mountain Farming Systems. Global Change and Mountain Regions, 23 of the series Advances in Global Change Research, 573-582.

Medonos, T., Jelínek, L. & Humpál, J. 2009. The national and regional impacts of direct payments modulation in the Czech Republic. Agricultural Economics, Czech, 55, 200-210.

Nowicki, P. L., Heart, K., van Meijl, H., Baldock, D., Banse, M. A. H., Bartley, J., ... & Terluin, I. J. 2003. Study on the economic, social and environmental impact of the modulation provided for in Article 10 of Council Regulation (EC) No 1782/2003. European Commission report.

Nowicki, P. L., van Meijl, J. C. M., Kneirim, A., Banse, M. A. H., Belling, M., Helming, J. F. M., ... & Mnatsakanian, R. SCENAR 2020: scenario study on agriculture and the rural world.

O'Rourkea, E., Kramma, N. & Chisholmb, N. 2004. The influence of farming styles on the management of the Iveragh uplands, southwest Ireland. Land Use Policy, 29, 805-816.

Öllerer, K. 2013. On the spatio-temporal approaches towards conservation of extensively managed rural landscapes in Central-Eastern Europe. Journal of Landscape Ecology, 6.

O'Rourke, E. & Kramm, N. 2012. High nature value (HNV) farming and the management of upland diversity. A review. European Countryside, 4, 116–133.

Osbeck, M., Schwarz, G., Morkvenas, Z. Dialogue on ecosystem services, payments and outcome based approach. Baltic Compass.

Overmarsa, K.P., Schulpa, J.E., Alkemadea, R., Verburgb, P., Temmec, A., Omtzigtb, N. & Schaminéed, J. 2014. Developing a methodology for a species-based and spatially explicit indicator for biodiversity on agricultural land in the EU. Ecological Indicators, 37, 186-198.

Paracchini, M. L., Petersen, J. E., Hoogeveen, Y., Bamps, C., Burfield, I., & van Swaay, C. 2015. High nature value farmland in Europe. An estimate of the distribution patterns on the basis of land cover and biodiversity data. JRC Scientific and Technical Reports.

Paracchini, M. L., Terres, J. M., Petersen, J. E., & Hoogeveen, Y. 2007. High Nature Value Farmland and Traditional Agricultural Landscapes: Open Opportunities in the Development of Rural Areas. Book Chapter: Europe's living landscapes. Essays on exploring our identity in the countryside.

Peeters, A. Past and future of European grasslands. The challenge of the CAP towards 2020. In: Grassland Science in Europe, 17.

Pointereau, P., Paracchini, M. L., Terres, J. M., Jiguet, F., Bas, Y., & Biala, K. 2007. Identification of High Nature Value farmland in France through statistical information and farm practice surveys. JRC Scientific and Technical Reports.

Poláková, J., Tucker, G., Hart, K., Dwyer, J., & Rayment, M. 2011. Addressing biodiversity and habitat preservation through measures applied under the Common Agricultural Policy. IEEP report.

Popović, V., Vasiljević, Z. & Bekić, B. 2015. HNV farming in the area of the Radan mountain and the role of agri-environment payments. Rural development policies from the EU enlargement perspective -ERDN book series rural areas and development vol 9.

Potter, C. 2004. Multifuctionality as an agricultural and rural policy concept. "Sustaining Agriculture and the Rural Environment: governance, policy and multifunctionality" edited by Floor Brouwer, advances in ecological economics. Edward Elgar.

Poux, X., Beaufoy, G., Bignal, E., Hadjigeorgiou, I., Ramain, B., & Susmel, P. 2006. Study on environmental consequences of Sheep and Goat farming and of the Sheep and Goat premium system. European Commission report.

R. Ripoll-Boscha, B. Díez-Unquerab, R. Ruizb, , D. Villalbac, E. Molinac, M. Joya, A. Olaizolad, & A. Bernuésa. 2012. An integrated sustainability assessment of mediterranean sheep farms with different degrees of intensification. Agricultural Systems, 105, 46–56.

Request for services Study on administrative burden reduction associated with the implementation of certain Rural Development measures. Under Framework Contract no. B3/ENTR/06/061.

Sanders, J., Stolze, M., & Padel, S. 2011. Use and efficiency of public support measures addressing organic farming. Institute of Farm Economics.

Santini, F., Guri, F., & Gomez y Paloma, S. 2013. Labelling of agricultural and foodproducts of mountain farming. European Commission report.

Schäfer, B., Markovic, M., Batakovic, R., Mehmeti, I., Zhllima, E., Simonovic, I., & Popa, H. 2011. Potential for Diversification of the Rural Sectors in Albania and Montenegro. Report prepared by NACCON GbR at the request of the European Commission.

Smaje, C. & Rowlatt, C. 2011. Key Policies for Agroecology in the UK. The All Party Parliamentary Group on Agriculture.

Sutcliffe, L., Akeroyd, J., Page, N. & Popa, R. 2015. Combining Approaches to Support High Nature Value Farmland in Southern Transylvania , Romania. HACQUETIA.

Sutkowska, B., Rozbicki, J. & Gozdowski, D. 2013. Farming Systems in High Nature Value (HNV) Farmland: a Case Study of Wigry National Park, Poland. Pol. J. Environ. Stud., 22, 521-531.

Swinnen, J., Ciaian, P. & Kancs, D. A. 2008. Study on the Functioning of Land Markets in the EU Member States under the Influence of Measures applied under the Common Agricultural Policy. European Commission report.

Targetti, S., Herzog, F., Geijzendorffer, I. R., Pointereau, P., & Viaggi, D. 2015. Relating costs to the user value of farmland biodiversity measurements. J Environ Manage, 1, 286-97.

Targetti, S., Herzog, F., Geijzendorffer, I.R., Pointereau, P. & Viaggi, D. 2016. Relating costs to the user value of farmland biodiversity measurements. J. Environmental Management 165, 286-297.

Terres, J.M., Nisini, L. & Anguiano, E. 2013. Assessing the risk of farmland abandonment in the EU. JRC policy and scientific report.

Terresa, J-M., Nisini Scacchiafichia, L., Waniaa, A., Ambarb, M., Anguianoc, E., Buckwelld, A., Coppolae, A., Gochtf, A., Nordström Källström, H., Pointereauh, P., Strijkeri, D., Visekc, L., Vrankenj, L. & Zobenak, A. 2015. Farmland abandonment in Europe: Identification of drivers and indicators, and development of a composite indicator of risk. Land Use Policy, 49, 20–34.

Ticker, G. & de Soye, Y. 2011. Impacts of climate change and selected renewable energy infrastructures on EU biodiversity and the Natura 2000 network. European project.

3. Literature reviewed on the Markets and Products theme

Adler, S., Fung, S., Huber, G. & Young, L. 2003. Learning our way towards a sustainable agri-food system. Three cases from Sweden: Stockholm Farmers market, Ramsjö Community Supported Agriculture and Järna Initiative for Local Production. Ecological Agriculture – 38, 2003.

Aguilara, M., Garcíab, A., Vicente López Álvarezc, J. & García-Hidalgod, J-F. 2012. Structure and methodology of a public information program (PIP) and the declaration of protected natural areas: The case of the Alto Tajo Natural Park, Spain. Forest Policy and Economics, Volume 17, April 2012, Pages 25–34, Integrating Forest Products with Ecosystem Services.

Akrigg, J. & Winthrop, WB. 2014. High Nature Value Farming in the Yorkshire Dales Buckden parish case study. Official report, 2014, Yorkshire Dales National Park Authority.

Alexandru Bogdan, I.I., János, S., Strateanu, A., Liviu Enache, M., Sandu, M., Strasser, H. & Florea Toba, G. 2013. Genetic Fingerprint – Innovative Method for Animal Products Traceability in the Context of Bio-economy. Procedia Economics and Finance, Volume 8, 2014, Pages 414-419. 1st International Conference 'Economic Scientific Research - Theoretical, Empirical and Practical Approaches', ESPERA 2013.

Allison, R. 2016. 2016 Farmers Weekly Awards: Arable Farmer finalists revealed. Farmers weekly, 29 July 2016.

Amante, B. & Lopez, V. 2012. Profitability and enhancement of agricultural sector. AFINIDAD, 68, 18-23.

Anderson, D. & Tyler, P. 2008. Modeling Rural Business Innovation: A Farm Diversification Application. The 82nd Annual Conference of the Agricultural Economics Society Royal Agricultural College,.

Anon. 2013. High Nature Value grasslands Securing the ecosystem services of European farming post 2013. International Conference, Sibiu.

Anthopoulou, T. & Goussios, D. 2015. Activating territorial specificities under a national PDO cheese label. Cooperation of small dairy territories to promote local-placed Feta in Thessaly Region

Paper prepared for the 145thEAAE Seminar "Intellectual Property Rights for Geographical Indications: What is at Stake in the TTIP?" April14-15, 2015, Parma, Italy.

Aubry, C. & Kebir, L. 2013. Shortening food supply chains: A means for maintaining agriculture close to urban areas? The case of the French metropolitan area of Paris. Food Policy 41, 85-93.

Baritauxa, V., Houdartb, M., Boutonnetc, J-P., Chazouled, C., Corniauxe, C., Fleuryd, P., Lacombef, N., Napoléone, M. & Tourrandg, J-F. 2016. Ecological embeddedness in animal food systems (re-)localisation: A comparative analysis of initiatives in France, Morocco and Senegal. Journal of Rural Studies, 43, 13–26.

Bernués, A., Ripoll, G. & Panea, B. 2012. Consumer segmentation based on convenience orientation and attitudes towards quality attributes of lamb meat. Food Quality and Preference, 26, 211-220.

Bernués, A., Ripoll, G. & Panea, B. 2012. Consumer segmentation based on convenience orientation and attitudes towards quality attributes of lamb meat. Food Quality and Preference, 26, 211–220

Bernués, A., Ruiz, R., Olaizola, A., Villalba, D. & Casasús, I. 2011. Sustainability of pasture-based livestock farming systems in the European Mediterranean context: Synergies and trade-offs Livestock Science, 139, 44–57.

Bertazzoli A., Ruggeri, A. & Samoggia, A. 2010. Short supply chain: analysis of the competitiveness of organic horticultural farmers at Italian regional level. 118th EAAE Seminar "Rural development: governance, policy design and delivery".

Bignal, E. & Jones, G. (eds). 2015. Innovation in shepherding in the Basque Country. La Cañada, 30.

Bîrhală, B. & Möllers, J. 2014. Community supported agriculture in Romania Is it driven by economy or solidarity? Leibniz Institute of Agricultural Development in Transition Economies.

Boeni R. & Seidl, I. 2012. Alpine products and services - supply situation in selected Swiss regions. Agrarforschung Schweiz, 3, 124-131.

Bösze, S. & Meyer, H. (Eds). 2014. Regional Development Opportunities of Protected Areas and Natural Assets in the Carpathians. Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians. WWF Danube-Carpathian Programme, Vienna, Austria, 2014.

Bukola Saraki, A. 2011. Zimbabwean Farmers and Agricultural Innovation in Nigeria. Chatham House.

Caballero, R. & Fernández-Santos, X. 2009. Grazing institutions in Castilla-La Mancha, dynamic or downward trend in the Spanish cereal–sheep system. Agricultural Systems, 101, 69-79.

Caballero, R., Gil, Æ. & Fernandez-Santos, X. An Experts Survey on Sustainability Across Twenty-Seven Extensive European Systems of Grassland Management.

Caetano, S.F. 2015. Productive practices of companies, conventions and rural territorial development: case study of the Spanish wine PDO Mentrida. Cuadernos Geograficos, 54, 98-123.

Calub, AD., Anwarhan, H. & Roder, W. 1996. Livestock production systems for Imperata grasslands. Agroforestry Systems, 36, 121-128.

Canfora, I. 2016. Is the short food supply chain an efficient solution for the sustainability in food market? Agriculture and Agricultural Science Procedia 8, 402-407.

Carolan, M. 2016. The sociology of food and agriculture: Second edition 2016, Source of the Document, The Sociology of Food and Agriculture: Second Edition, pp. 1-348.

Carona, A., Boisvertb, V., Berthelotc, Ch., Chambona, Ph., Gueringera A. & Angeond, V. 2010. Biodiversity conservation as a new rationale for localized and sustainable agro-food systems. The case of two French PDO mountain cheeses. 9th European IFSA Symposium, 4-7 July 2010,Vienna(Austria).

Conneely, R. & Mahon, M. 2015. Protected geographical indications: Institutional roles in food systems governance and rural development. GEOFORUM, 60, 14-21.

Darbellay, C. 2009. Medicinal Plants in Valais: A Success Story. Mountain Forum, Bulletin, January 2009.

Davies, J., Niamir-Fuller, M., Kerven, C. & Bauer, K. Extensive livestock production in transition.

Dax, T. 2009. Recognising the Amenities of Mountain Agriculture in Europe. Mountain Forum, Bulletin, January 2009.

Deuninck, J. Carels, K., Van Gijseghem, D. & Piessens, I. Innovation in agriculture and horticulture in Flanders: results of the Agricultural Monitoring Network.

Dominique, B., Schmitt, E., Cravero, V. & Tanquerey-Cado, A. 2015. Sustainability Assessment of PDO value chains: the cases of L' Etivaz and Le Gruyere in Switzerland. Paper prepared for the 145th EAAE Seminar "Intellectual Property Rights for Geographical Indications: What is at Stake in the TTIP?" April 14-15, 2015. Parma, Italy.

Dzhabarova, Y. & Peneva, M. 2014. Direct Marketing for High Nature Value Products – The Bulgarian Approach. Turkish Journal of Agricultural and Natural Sciences, 2.

Dzhabarova, Y. & Peneva, M. 2014. Direct Marketing for High Nature Value Products – The Bulgarian Approach. Turkish Journal of Agricultural and Natural Sciences, 2, 1784-1789.

Eastham, J. F. 2014. An analysis of the success of UK agricultural marketing cooperatives: can they effectively redress power imbalances in current market conditions? Ph.D. thesis, University of Birmingham. 2014.

EIP-AGRI Focus Group. 2016. EIP-AGRI Focus Group - Benefits of landscape features for arable crop production. Final report March 2016.

EIP-AGRI Focus Group. 2016. EIP-AGRI Focus Group - High Nature Value –Farming profitability. Final report January 2016.

Escribano, A. J. 2016. Beef Cattle Farms' Conversion to the Organic System. Recommendations for Success in the Face of Future Changes in a Global Context. Sustainability 2016, 8, 572.

Escribano, A.J., Gaspar, P., Mesías, F.J.b, Escribano, M., Pulido, F. Comparative sustainability assessment of extensive beef cattle farms in a high nature value agroforestry system (Book Chapter). Rangeland ecology, management and conservation benefits (Book).

Escribano, A.J., Gaspar, P., Mesías, F.J., Escribano, M., Pulido, F. 2015. Comparative sustainability assessment of extensive beef cattle farms in a high nature value agroforestry system. Rangeland Ecology, Management and Conservation Benefits, pp. 65-86.

EU Commission. 2010. Environmental impacts on different crop rotations in the European Union.

European Agri-cooperatives Cocega. 2014. Developments in agricultural cooperatives in the EU 2014. European Agri-cooperatives Cocega.

European Commission. 2014. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences. European Commission, 2014.

European CSA research group. 2016. Overview of Community supported agriculture in Europe. European CSA research group 2016.

Farruggia, A., Pomiès, D., Bethier, A., Troquier, O., Le Bec, G., Paccard P., Baumont B. & Pradel P. 2010. Balance between production and biodiversity in two upland dairy grazing systems. Grassland in a changing world. Proceedings of the 23rd General Meeting of the European Grassland Federation, Kiel, Germany, 29th August-2nd September 2010.. Mecke Druck und Verlag, 2010. pp:940-942.

Feagan, R., Morris, D. & Krug, K. 2004. Niagara region farmers' markets: local food systems and sustainability considerations. Local Environment: The International Journal of Justice and Sustainability, 9, 235-254.

Fokaides, P. A., Tofas, L., Polycarpou, P. & Kylili, A. 2015. Sustainability aspects of energy crops in arid isolated island states: the case of Cyprus. Land Use Policy 49, 264–272.

Foundation for Arable Research. FAR Research and Extension Strategy and Portfolio. Foundation for Arable Research.

Freibauer, A. (chair), Mathijs, E. (rapporteur), Brunori, G., Damianova, Z., Faroult, E., Girona i Gomis, J., O´Brien, L. & Treyer, S. Sustainable food consumption and production in a resource-constrained world. European Commission – Standing Committee on Agricultural Research (SCAR).

Fuller, D. 2011. Case Study on Potential for Scaling Up: Adding Value to Waste in the Cassava Processing-Goat Keeping Systems in Nigeria. Washington, DC: the World Bank.

Fundația ADEPT Transilvania. 2016. Rural Development and High Nature Value Farmland in Romania (project broshure). Fundația ADEPT Transilvania.

Galli, F. & Brunori, G. Short Food Supply Chains as drivers of sustainable development FP7 project FOODLINKS (GA No. 265287).

Gazenbeek, A. & Jedicke, E. Building up a central and eastern European cooperation in nature conservation -oriented grassland use –TRINET. Deutschen Bundesstiftung Umwelt.

Geographic Subgroup.2012. Green Food Project Geographic Sub Group Report. Geographic Subgroup.

Gomez Ramos, A.I, Bardajíaz Caráte, I.S. & Atance Muñiz, I.G. The role of geographical labelling ininsertingext en sivecattle systems in to beef marketing channels. Evidence from three Spanish cases studies. Cahiers d'economies et sociologie rurales, no 78, 206.

Goodman, D., DuPuis, E.M. & Goodman, M.K. Alternative food networks: Knowledge, practice, and politics. Alternative Food Networks: Knowledge, Practice, and Politics, 1-308.

Gueringer A., Orth D., Balay C. & Landre F. 2010. Contribution of different farming and forage systems to biodiversity: an example in a PDO cheese area in French mountains. 9th European IFSA Symposium, 4-7 July 2010, Vienna (Austria).

Hauck, M., Artykbaeva, G.T., Zozulya, T.N. & Dulamsuren, C. 2016. Pastoral livestock husbandry and rural livelihoods in the forest-steppe of east Kazakhstan. Journal of Arid Environments, 133, 102-111.

Hennis, M. 2005. Globalization and European Integration: The Changing Role of Farmers in the Common Agricultural Policy - Chapter 3. Rowman & Littlefield.

Hinrichs, C.C. 2000. Embeddedness and local food systems: note on two types of direct agricultural market. Journal of Rural Studies, 16, 295-303.

Hocquettea, J-F., Botreaua, R., Picarda, B., Jacquetb, A., Pethickc, D.W. & Scolland, N.D. 2012. Opportunities for predicting and manipulating beef quality. Meat Science, Volume 92, Issue 3, November 2012, Pages 197–209, 58th International Congress of Meat Science and Technology.

Innovation and changing 'worlds of production': Case-studies of Norwegian dairies

Institute for European Environmental Policy (IEEP) 2016. Transforming approaches to rural land management. Stimulating long-lasting improve-ments in the delivery of social, economic and environmental benefits from EU agricultural and PEGASUS D3.1: Ten country reports on socio-political, economic and institutional drivers. 5.4.2016.

International Visegrad Fund, the Ministry of Foreign Affairs of the Republic of Korea, and the European Commission. Making small scale family farming profitable. Sharing experience from Visegrad countries to Serbian farmers.

Jari, B. & Fraser, G. C. G. 2009. An analysis of institutional and technical factors influencing agricultural marketing amongst smallholder farmers in the Kat River Valley, Eastern Cape Province, South Africa. African Journal of Agricultural Research Vol. 4 (11), pp. 1129-1137, November, 2009.

Jewett, J.G., Nelson, B. & Braate, D. Marketing Local Food. Minnesota Institute for Sustainable Agriculture.

Junzhe, NA. 2014. Roles of Farmer Specialized Cooperatives in Agricultural Production Reflected From Nehe City. Eastern academic forum.

Karoglan Todorović, S. 2013. Traditional agricultural land use practices in the Dinaric Arc. International Union for Conservation of Nature and Natural Resources.

Kazakova, Y. & Peneva, M. High Nature Value Farmlands A Strengthe or a weaskeness to regional development? Case studies from 3 Black Sea countries. Istanbul Journal of Economics and Management.

Kerven, C. & Behnke, R. 2011. Policies and practices of pastoralism in Europe. Pastoralism: Research, Policy and Practice December 2011, 1:28.

Kjeldsen, C. & Fjelsted Alroe, H. 2006. Localness as the new orthodoxy? Critical reflections on localisation of food systems. Joint Organic Congress, Odense, Denmark, May 30-31, 2006.

Kneafsey, M., Venn, L., Schmutz, U., Balázs, B., Trenchard, L., Eyden Wood, T., Bos, E., Sutton, G. & Blackett, M. 2013. Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics. JRC, 2013.

Kukreja, R. (Editor). Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to. Mediterranean Regions Publisher IFOAM EU Group Rue du Commerce 124, 1000 Brussels, Belgium.

Lamarque, P. & Lambina, E.F. 2015. The effectiveness of marked-based instruments to foster the conservation of extensive land use: The case of Geographical Indications in the French Alps. Land Use Policy, 42, 706–717.

Les Produits Laitiers. P.D.O. : the best proof of authenticity. Les Produits Laitiers.

Local Food Systems in Europe: Case studies from five countries and what they imply for policy and practice. FAAN - Facilitating Alternative Agro-Food Networks: Stakeholder Perspectives on Research Needs'.

Luick R. & Schrode S. 2010. Extensive grasslands beyond the year 2013 – present situation and options for the future? Grassland in a changing world. Proceedings of the 23rd General Meeting of the European Grassland Federation, Kiel, Germany, 29th August-2nd September 2010.. Mecke Druck und Verlag, pp: 97-99.

Maeda, M., Tokimatsu, K. & Mori, S. 2015. A Global Supply-demand Balance Model to Assess Potential CO2 Emissions and Woody Biofuel Supply from Increased Crop Production. Energy Procedia, 75, 2865-2870.

Makhura, M., Kirsten, J. & Delgado, C. 2002. Transaction costs and small holder participation in the maize market in the Northern Province of South Africa. Proceedings of the Eastern and Southern Africa Regional Maize Conference Nairobi (Kenya) 5-11 Feb 2002; Delgado, C; Friesen, D.K.|Palmer, A.F.E; Kirsten, J., p. 463-467.

Mancini, M. C. 2016. Localised Agro-Food Systems and Geographical Indications in the Face of Globalisation: The Case of Queso Chontaleño Sociologia Ruralis, 53, 180–200.

Mansfield, L. & Peck, F. 2013. Applying 'fair trade' to British upland agriculture. Outlook on agriculture, 42, 163-170.

McMorran, R., Santini, F., Guri, F. & Gomez-y-Paloma, S., Price, M., Beucherie, O., Monticelli, C., Rouby, A., Vitrolles, D. & Cloye, G. 2015. A mountain food label for Europe? The role of food labelling and certification in delivering sustainable development in European mountain regions. Journal of Alpine Research | Revue de géographie alpine 103-4. Varia.

Mirela, S. & Gheorghe, S. 2009. Local fairs – method for enhancement of the local products. Acta Universitatis Cibiniensis, Agricultural Sciences, 1.

Mirela, S. et al. 2012. Conservation of natural resources based on exploitation of local/traditional products, and those important for nature conservation. Journal of Horticulture, Forestry and Biotechnology, 16, 112- 115.

Moellers, J. & Bîrhală, B. 2014. Community Supported Agriculture: A promising pathway for small family farms in Eastern Europe? A case study from Romania. Landbauforsch · Appl Agric Forestry Res, 3/4,139-150.

Moraine, M., Lumbroso, S. & Poux, X. 2016. A comprehensive outlook on the diversity of Agroecological initiatives in Europe. From farming systems to food systems. IDDRI - European Forum On Nature Conservation And Pastoralism.

Morgan, K. & Murdoch, J. 2000. Organic vs. conventional agriculture: knowledge, power and innovation in the food chain. Geoforum 31, 159-173.

Morris, C. & Buller, H. The local food sector: A preliminary assessment of its form and impact in Gloucestershire. British Food Journal, 105, 559 – 566.

Muldoon, M.F., Taylor, A.K., Richman, N. & Fisk, J. 2013. Innovations in local food enterprise - Fresh ideas for a just and profitable food system. Wallace Center at Winrock International.

Mwakaje, A. G. Information and Communication Technology for Rural Farmers Market Access in Tanzania. Journal of Information Technology Impact, 10, 111-128.

Nardone, A., Zervas, G. & Ronchi, B. 2004.Sustainability of small ruminant organic systems of production. Livestock production science, 90, 27-39.

Nedelciu, CE. 2014. Preservation of HNV farmland cultural landscapes in Transylvania. A case study on two small scale farmer communities. Master thesis, Central European University Budapest.

O'Hara, S. U. & Stagl, S. 2001. Global Food Markets and Their Local Alternatives: A Socio-Ecological Economic Perspective. Population and Environment, 22, 533–554.

Ortmann, G.F. & King, R. 2007. Agricultural cooperatives II: Can they facilitate access of small-scale farmers in South Africa to input and product markets? Agrekon: Agricultural Economics Research, Policy and Practice in Southern Africa, 46, 219-244.

Ortmann. G.F. & King, R.P. 2007. Agricultural cooperatives II: Can they facilitate access of small-scale farmers in South Africa to input and product markets? Agrekon, 46.

Page, N. & Popa, R. (edited by Kukreja, R.). 2010. Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to Mediterranean Regions. International Federation of Organic Agriculture Movements EU Group, 2010, Manual.

Page, N., Popa, R., Gherghiceanu, C. & Balint, L. Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania. Mountain Hay meadows.

Page, N., Popa, R., Gherghiceanu, C. & Balint, L. Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania. Mountain hay meadows – hotspots of biodiversity and traditional culture - conference publication.

Page, N., Popa, R., Gherghiceanu, C. & Balint, L. Linking High Nature Value Grasslands to Small-Scale Farmer Incomes: Târnava Mare, Romania. Mountain hay meadows: hotspots of biodiversity and traditional culture, Ed. Barbara Knowles, Society of Biology, London.

Paolotti, L., Boggia, A., Castellini, C., Rocchi, L. & Rosati, A. 2016. Combining livestock and tree crops to improve sustainability in agriculture: a case study using the Life Cycle Assessment (LCA) approach. Journal of Cleaner Production, 131, 351-363.

Peeters, A. 2015. Environmental impacts and future challenges of grasslands and grasslandbased livestock production systems in Europe (chapter 17). Grassland: A Global Resource Perspective,2015, Range Management Society of India, Editors: P.K. Ghosh, S.K. Mahanta, J.B. Singh, P.S. Pathak.

Peneva, M. & Kazakova-Mateva, Y.2015. Local Food Systems and Rural Development in Bulgaria. Scientific Journal Warsaw Univers Quality of Life Sciences – SGGW. Problems of World Agriculture volume 15, 147–155.

Peneva, M., Kazakova-Mateva, Y. & Mishev, P. 2014. High Nature Value Farming for sustainable local food production and consumption. EAAE 2014 Congress 'Agri-Food and Rural Innovations for Healthier Societies', 2014.

Peters, R. (editor). 2011. Agricultural product quality: a success factor for EU rural area. EU rural review no.8, 2011.

Pinto-Correia, T., Menezes, H. & Filipe Barroso, L. 2014.The Landscape as an Asset in Southern European Fragile Agricultural Systems: Contrasts and Contradictions in Land Managers Attitudes and Practices Landscape Research,2014, 39:2, 205-217.

Popa, R. 2010. Case study from Romania Fundatia Adept Transilvania, Saschiz. Greening the EU Common Agriculture Policy Rural Development initiatives and policy Bled, Slovenia 15.11.2010.

Price, M., Beucherie, O., Monticelli, C., Rouby, A., McMorran, R., Santini, F., Guri, F., Gomez-y-Paloma, S., Vitrolles, D. & Coyle, G. 2015. Un label européen pour les produits alimentaires de montagne? Le rôle de la labellisation alimentaire et de la certification comme contribution au développement durable des régions montagneuses d'Europe. Journal of Alpine Research | Revue de géographie alpine 103, Varia.

Progress Consulting S.r.l. & Living Prospects Ltd. Marketing on local markets'. EU

Quetier, F., Marty, P., & Lepart, J. Farmers' management strategies and land use in an agropastoral landscape: roquefort cheese production rules as a driver of change. Agricultural Systems, 84, 171-193.

Rabbinge, R. & Linnemann, A. (editors). European Food Systems in a Changing World European Science Foundation.

Randela, R., Alemu, Z.G. & Groenewald, J.A. 2008. Factors enhancing market participation by small-scale cotton farmers. Agrekon: Agricultural Economics Research, Policy and Practice in Southern Africa, 47, 451-469.

Randon, E. 2012. Potato supply chain in Ethiopia: access to market information, farmers' cooperatives and margin in West Arsi Zone, Ethiopia. MSc thesis Wageningen University, Development Economics 2012

Redman, M. 2010. Securing Public Benefits from Subsistence Agriculture in Romania. Assessing the Impact of Rural Development Policies (incl. LEADER). Official Report, 2010.

Revello Chion A. , Battelli G. , Giaccone D. , Peiretti P.G. , Tabacco E. & Borreani G. 2010. Seasonal variation of fatty acid in milk of intensive and extensive dairy systems in Northern Italy. Grassland in a changing world. Proceedings of the 23rd General Meeting of the European Grassland Federation, Kiel, Germany, 29th August-2nd September 2010. Mecke Druck und Verlag, 2010. pp:613-615.

Ripoll-Bosch, R., Díez-Unquera, B., Ruiz, R., Villalba, D., Molina, E., Joy M., Olaizola, a.A. & Bernués, A. 2012. An integrated sustainability assessment of mediterranean sheep farms with different degrees of intensification. Agricultural Systems 105 (2012) 46–56.

Ripoll-Boscha, R., de Boerb, I.J.M., Bernuésa, A. & Vellingac, T.V. 2013. Accounting for multi-functionality of sheep farming in the carbon footprint of lamb: A comparison of three contrasting Mediterranean systems. Agricultural SystemsVolume 60–68.

Robinson, R. 2009. MOUNTAIN DEVELOPMENT BASED ON CULTURAL AND. ENVIRONMENTAL ASSETS. European case studies and proposals to guide. Carpathian and Balkan projects. Euromontana SARD-M (Sustainable Agriculture and Rural Development-Mountain, 2009.

Robinson, R. 2009. Mountain development based on cultural and. Environmental assets. European case studies and proposals to guide. Carpathian and Balkan projects. Euromontana SARD-M (Sustainable Agriculture and Rural Development-Mountain, 2009.

Robinson, R. Mountain Development based on cultural and environmental assets. Euromontana SARD-M report on positive externalities 2008-2009.

Rubino, R., Morand-Fehr, P., Renieri, C., Peraza, C. & Sarti, F.M. 1999. Typical products of the small ruminant sector and the factors affecting their quality. 34, 289–302.

Rytkönena, P. Bonowa, M., Johanssonab, M. & Persson, Y. 2013. Perspectives, Goat cheese production in Sweden – a pioneering experience in the re-emergence of local food. Acta Agriculturae Scandinavica, Section B — Soil & Plant Science, 63, Supplement 1. Special Issue: Local Food - a step towards better and more environmentally friendly products.

Sage, C. 2003. Social embeddedness and relations of regard:: alternative 'good food' networks in south-west Ireland Journal of Rural Studies, Volume 19, Issue 1, January 2003, Pages 47–60, International Perspectives on Alternative Agro-Food Networks: Qua lity, Embeddedness, Bio-Politics.

Sanz-Cañada, J. & Muchnik, J. Geographies of Origin and Proximity: Approaches to Local Agro-Food Systems. Culture & History Digital Journal, 5 (1): e002.

Schilthuis, G. & Van Bekkum, O-F. 2000. Agricultural Cooperatives in Central Europe: Trends and Issues in Preparationfor EU Accession. Van Gorcum Ltd 2000.

Schlicht, S., Volz, P., Weckenbrock, P. & Le Gallic, T. Community Supported Agriculture: An overview of characteristics, diffusion and political interaction in France, Germany, Belgium and Switzerland. ACTeon.

Sereke, F., Graves, A.R., Dux, D., Palma, J.H.N. & Herzog, F. 2015. Innovative agroecosystem goods and services: key profitability drivers in Swiss agroforestry. Agronomy for Sustainable Development, 35, 759–770.

Sineiro-García, F., Vázquez-González, I. & García-Arias A. I. 2014. Mountain Family Farms in Galicia, Spain: Challenges and Strategies. Mountain Research and Development 34, 375-385.

Sini, M.P. 2014. Long and short supply chain coexistence in the agricultural food market on different scales: oligopolies, local economies and the degree of liberalisation of the global market. European Scientific Journal, 10.

Stancium, M., Savoiu, G., Vlad, I. & Sand, C. 2010. Considerations regarding the importance of local products for the preservation of nature. Scientific Papers: Series D, Animal Science - The International Session of Scientific Communications of the Faculty of Animal Science, 362-368. 7p.

Streifeneder, T., Hoffmann, C. & Vanin, A. 2015. Background analysis and documentation as basis for the development of the Carpathian Convention Sustainable Agriculture and Rural Development Protocol. European Academy Bolzano (EURAC Research) 2015.

Streifeneder, T. 2015. Cooperative Systems in Mountain Regions: A Governance Instrument for Smallholder Entrepreneurs. Journal of Alpine Research | Revue de géographie alpine 103-1.

Sturaro, E., Marchiori, E., Cocca, G., Penasa, M., Ramanzin, M. & Bittante, G. 2013. Dairy systems in mountainous areas: Farm animal biodiversity, milk production and destination, and land use. Livestock Science 158, 157-168.

Targetti, V.,Herzog, F., Geijzendorffer, I.R., Pointereau, P. & ViaggiD. 2016. Relating costs to the user value of farmland biodiversity measurements. Journal of Environmental Management, 165, 286-297.

Tefera, E. 2008. The role of dairy cooperatives in stimulating innovation and market oriented smallholders development: the case of Ada'a dairy cooperative, Central Ethiopia. MSc thesis (Rural Development and Agricultural Extension). 128p. Haramaya (Ethiopia): 2008.

THE N2K GROUP. European Economic Interest Group. Managing farmland in Natura 2000 CASE STUDIES. THE N2K GROUP. European Economic Interest Group.

Ungureanu, D. 2014. Orientations regarding the support of romanian mountain area between 2014 - 2020, through specific objectives. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, 14.

Vagnoni, E., Franca, A., Breedveld, L., Porqueddu, C., Ferrara, R., & Duce, P. Environmental performances of Sardinian dairy sheep production systems at different input levels. Science of the Total Environment, 502, 354-361.

Vecchio, R. European and United States farmers' markets: simila rities, differences and potential developments. 113th EAAE Seminar "A resilient European food industry and food chain in a challenging world".

Viaggi, D. & Cuming, D. 2012. Innovation in Multiple Networks and Networks of Networks: The Case of the Fruit Sector in Emilia-Romagna. Int. J. Food System Dynamics 3 (3), 2012, 258-263.

Vranic, M. Agri-environmental perspective and Leader/CLLD approach as opportunities for sustainable rural development in Croatia. Série «Master of Science» n° 143 CIHEAM–IAMM.

Vuylsteke A. & Van Huylenbroeck, G. 2002. "Marketing Sustainable Agriculture: An analysis of the potential role of new food supply chains in sustainable rural development". SUS-CHAIN QLK5-CT-2002-01349.

Winter, M. 2005. Geographies of food: agro-food geographies – food, nature, farmers and agency. Progress in Human Geography 29, 609-617.

Winter, M. 2006. Rescaling rurality: Multilevel governance of the agro-food sector. Political Geography 25, 735-751.

4. Literature reviewed on the Farming Techniques and Technology theme

Bakker, T. 2013. Innovation processes and sustainability of farmers' practices in minimum tillage. A qualitative survey in Brittany. Master thesis, Publisher: Norwegian University of Life Sciences, Ås, 2013.

Baldock, D., Hart, K. & Scheele, M. Public goods and public intervention in agriculture. European Network for Rural Development.

Bartley, J., Hart, K. & Swales, V. 2009. Exploring policy options for more sustainable livestock and feed production. IEEP , March 2009.

Bellarby, J., Tirado, R., Leip, A., Weiss, F., Lesschen, J. & Smith, P.2013. Livestock greenhouse gas emissions and mitigation potential in Europe. Global Change Biology 19, 3–18.

Biasi, R. & Brunori, E. 2015. The on-farm conservation of grapevine (Vitis vinifera L.) landraces assures the habitat diversity in the viticultural agro-ecosystem. Vitis 54, 265–269.

Biasi, R., Brunori, E., Smiraglia, D. & Salvati, L. 2015. Linking traditional tree-crop landscapes and agro-biodiversity in central Italy using a database of typical and traditional products: a multiple risk assessment through a data mining analysis. Biodiversity and Conservation, 24, 3009-3031.

BIrdLife Europe. High farming nature value how diversity in europe's farm systems delivers for biodiversity. BIrdLife Europe.

CER(14)8219:3–AP/DDJ/CB/mvs. Strategic Agenda for Arable Crops. Official report.

Chamberlain, T. P., & Daly, M. J. 2005. Innovative use and adaption of a microbial technology (em) for large scale vegetable, arable and stock production on an organic farm in canterbury, New Zealand . IFOAM conference Adelaide Australia (pp. 18-21).

Cooper, T. Hart, K. & Baldock, K. 2009. Provision of Public Goods through Agriculture in the European Union. Institute for European Environmental Policy: London, 2009 - Report Prepared for DG Agriculture and Rural Development.

Cooper, T., Pezold, T. (eds.), 2010. Keenleyside, C., Đorđević-Milošević, S., Hart, K., Ivanov, S., Redman, M. & Vidojević, D. Developing a National Agri-Environment Programme for Serbia. Gland, Switzerland and Belgrade, Serbia. IUCN Programme Office for South-Eastern Europe.

Cortez-Arriolaa, J., Groot, J., Rossing, W., Scholberg, J., Améndola Massiotti, R. & Tittonell, P. 2016. Alternative options for sustainable intensification of smallholder dairy farms in North-West Michoacán, Mexico. Agricultural Systems 144, 22–32.

Coteur, I., Marchand, F., Debruyne, L., Dalemans, F. & Lauwers, L. A framework for guiding sustainability assessment and on-farm strategic decision making. Environmental Impact Assessment Review.

Day, P. et. al. 2008. Managing Complex Systems: Preliminary findings from Grain & Graze program. Report from the Grain & Graze project.

de Bucka, A.J., van Rijnb, I., Rolingb, N.G. & Wossinkc, G.A.A. 2001. Farmers' reasons for changing or not changing to more sustainable practices: An exploratory study of arable farming in the Netherlands. The Journal of Agricultural Education and Extension: Competence for Rural Innovation and Transformation, 7, 153-166.

de la Rosa, D. & Anaya-Romero, M. MicroLEIS DSS: For Planning Agro-Ecological Soil Use and Management. Book chapter: Decision Support Systems in Agriculture, Food and the Environment: Trends, Applications and Advances.

Delbaere, B. (ECNC). (With input from Buguna Hoffmann, L. (ECNC), Pinborg U. & Peterson. J.E. (EEA). The impact of agricultural policies on biological diversity and landscape. European Envirnment Agency.

Diederen,P., van Meijl, H., Wolters, A. & Bijak, K. 2003. Innovation Adoption in Agriculture: Innovators, Early Adopters and Laggards. Cahiers d'économie et sociologie rurales, n° 67, 2003.

Duru, M. & Hubert, B. Management of grazing systems: from decision and biophysical models to principles for action. Agronomie.

EFNCP & WWF-DCP. High Nature Value farmlands: Recognising the importance of South East European landscapes - Final summary report (Bulgaria & Romania).

EIP Agri - European Commission. Innovative Solutions for Organic Farmers in the EU. Optimising Arable Yields.

European Communities. 2009. Creativity and Innovation in EU Rural Development. European Communities, 2009.

European Environmenat Agency. 2010. Europe's ecological backbone: recognising the true value of our mountains.

European Innovation Partnership for Agricultural Sustainability and Productivity. 2016. EIP-AGRI Focus Group Sustainable High Nature Value (HNV) farming.

Garnier, J., Anglade, J., Benoit, M., Billen, G., Puech, T., Ramarson, A., Passy, P., Silvestre, M., Lassaletta, L., Trommenschlager, J., Schott, C. & Tallec, G. 2016. Reconnecting crop and cattle farming to reduce nitrogen losses to river water of an intensive agricultural catchment (Seine basin, France): past, present and future. Environmental Science & Policy, 63, 76-90.

Gazenbeek, A. & Jedicke, E. Building up a central and eastern European cooperation in nature conservation -oriented grassland use –TRINET. Deutschen Bundesstiftung Umwelt.

Grandgirard, D., Oheix, S., Leclercq, C., Lançon, L., Liagre, F., Dupraz, C., Mézière, D., Poulain, J. L. & Wartelle, R. 2014. SCA0PEST, a pesticide-free agroforestry cropping system: ex-ante performance evaluation. 2nd European Agroforestry Conference. EURAF, 2014, pp.35-38.

Hancock, M., Duffield, S., Boyle, J. & Wilson, J.D. 2016. The effect of harvest method on cereal stubble use by seed-eating birds in a High Nature Value farming system. Agriculture, Ecosystems & Environment, 219, 119–124.

Institute for European Environmental Policy. 2007. Final report for the study on hnv indicators for evaluation. Report prepared by the Institute for European Environmental Policy for DG Agriculture.

Joensuu, K. & Sinkko, T. 2015. Environmental sustainability and improvement options for agribiomass chains: Straw and turnip rape. Biomass and Bioenergy 83, 1e7.

Kazakova, Y. & Stefanova, V. High Nature Value Farming in the Western Balkans: Current Status and Key Challenges – a Scoping Document. European Forum on Nature Conservation and Pastorialism.

Kooistra, K.J., Pyburn, R. & Termorshuizen, A.J. The sustainability of cotton. Consequences for man and environment. Wetenschapswinkel Wageningen Universiteit en Reseachcentrum. Rapport No. 223.

Kukreja, R. (Editor); Page, N. & Popa, R. 2010. Organic Farming and Biodiversity in Europe: Examples from the Polar Circle to Mediterranean Regions. International Federation of Organic Agriculture Movements EU Group, 2010, Manual.

Lechenet, M., Bretagnolle, V., Petit, M., Bockstaller, Ch., Boissinot, F., Petit, S. & Munier-Jolain, N.M. 2014. Reconciling Pesticide Reduction with Economic and Environmental Sustainability in Arable Farming. PloS One.

Lefebvre, M., Espinosa, M., Gomez, S. & Paloma, Y. 2012. The influence of the Common Agricultural Policy on agricultural landscapes. European Commission Joint Research Centre.

McCracken, D.I. 2011. Describing and characterising the main types of HNV farming systems in Scotland. Report prepared for the Scottish Government.

Meynard, J.M., Messéan, A., Charlier, A., Charrier, F., Farès, M., Le Bail, M., Magrini, M.B., Savini, I. & Réchauchère, A. 2013. Crop diversification: obstacles and levers. Study of farms and supply chains. Synopsis of the study report, INRA.

Moreno, G., Franca, A., Pinto Correia, M. T. & Godinho, S. Multifunctionality and dynamics of silvopastoral systems. Options Méditerranéennes, A.

Oppermann, R., Beaufoy, G. & Jones, G. 2012. High nature value farming in europe, 35 european countries – experiences and perspectives. Verlag Regionalkultur.

Ratnadass, A., Fernandes, P., Avelino, J. & Habib, R. Plant species diversity for sustainable management of crop pests and diseases in agroecosystems: a review. Agronomy for Sustainable Development.

Ripoll-Bosch, R., de Boer, I.J.M., Bernués, A. & Vellinga, T.V. Accounting for multi-functionality of sheep farming in the carbon footprint of lamb: A comparison of three contrasting Mediterranean systems. Agricultural Systems.

Samiee, S. & Kurosh, R-M. 2015. The proposed alternative model to predict adoption of innovations: The case of no-till technology in Iran. Journal of the Saudi Society of Agricultural Sciences.

Santos-Silva, C., & Louro, R. Assessment of the diversity of epigeous Basidiomycota under different soil-management systems in a montado ecosystem: a case study conducted in Alentejo. Agroforestry Systems.

Schrijver, R. & Uetake, T.2015. Public goods and externalities: agri-environmental policy measures in the Netherlands. OECD Food, Agriculture and Fisheries Papers, No. 82, OECD Publishing, Paris.

Schultea, R., Creamer, R., Farrelly, N., Donnellan, T., Fealy, R., O'Donoghue, C. & O'hUallachain, D. 2014. Functional land management: A framework for managing soil-based ecosystem services for the sustainable intensification of agriculture. Environmental Science & Policy 38, 45–58.

Schulz, T. 2015. An uphill struggle against scrub encroachment: Implementation of the alpine pasturing subsidy scheme in Switzerland. Land Use Policy, 42, 318-328.

Sluis, T., van der Buijs, J., van Eupen, M., Koopmanscha, E., Gosselink, J.M.J. & Kliuiev, J.M.J. Development of an ECONE T for Lugansk Oblast, Rural development and sustainable development in Ukraine. Alterra report.

Steen Jensen, E., Bedoussac, L., Carlsson, G., Journet, E-P., Justes, E. & Hauggaard-Nielsen, H. 2015. Enhancing Yields in Organic Crop Production by Eco-Functional Intensification. Sustainable Agriculture Research, 4.

Stilma, E.S.C., Vosman, B., Korevaar, H., Poel-Van Rijswijk, M.M., Smit, A.B. & Struik, P.C. 2007. Designing biodiverse arable production systems for the Netherlands by involving various stakeholders. NJAS-Wageningen Journal of Life Sciences 55, 1-20.

Sturaro, E., Marchiori, E., Cocca, G., Penasa, M., Ramanzin, M. & Bittante, G. 2013. Dairy systems in mountainous areas: Farm animal biodiversity, milk production and destination, and land use. Livestock Science 158, 157-168.

Sullivan, C., Finn, J., Gormally, M. & Skeffington, M. 2013. Field boundary habitats and their contribution to the area of semi-natural habitats on lowland farms in Eastgalway, Western Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, 113B, 187-199.

Woodill, G. & Udell, C. Agriculture: The Application of Mobile Computing to the Business of Farming.

Yara. 2016. Boron deficiencies shouldn't be overlooked. Internet site.

ANNEX 1. Overview of the Regulatory Framework of relevance for High Nature Value farmland

1. Introduction

This is an overview of the agriculture regulatory framework of relevance to High Nature Value (HNV) farmland and it is written in the form of a guide. It will be of particular use on the baseline and innovation assessments of the regulatory framework in HNV areas. It is not a comprehensive review but rather a summary of the regulations that impact on farming activities (primary production and direct marketing by producers) on HNV farmland. Broader policy and regulatory framework on international trade are beyond scope of this document. The starting point for the overview was the policy areas of the DG Agriculture and Rural Development website and associated links. This led to the breakdown of the HNV related regulatory framework into 8 broad themes:

1) Direct payments
2) Marketing of agricultural products
3) Rural development
4) Food and feed hygiene
5) Animal health and welfare
6) Plant health
7) Agriculture and environment
8) Research and innovation

The regulatory framework deals mainly with the CAP Pillar 1 (direct payments and markets) and II (rural development) supports and various regulations that are linked to CAP through cross compliance requirements related to environment, plant health and animal health. Another important aspect in the context of HNV LINK are the supports available to stimulate research and innovation across the EU.

There are a total of 2755 legislative agreements, directives, regulations and decisions currently in force specifically related to agriculture (EUR-lex 2016).

The objectives for the CAP as set out in EU Regulation No 1306/2013, Article 110(2), are:

- Promoting viable food production, with a focus on agricultural income, agricultural productivity and price stability;
- Promoting sustainable management of natural resources and climate action, with a focus on greenhouse gas emissions, biodiversity, soil and water;
- Promoting balanced territorial development, with a focus on rural employment, growth and poverty in rural areas.

These objectives are to be delivered through Pillars I and II of the CAP. The funding for Pillar I and Pillar II of the CAP comes from Member States (MS) national envelopes, which are the portion of total CAP funding allocated to individual MS.

If you are interested in more detailed information on wider agricultural policy and summary of wider EU agriculture legislative framework, information is available at following links:

- Overview of policies, information and services relating to food and farming.
- Summary of EU legislation relating to agriculture.

2. CAP Pillar I Direct Support

2.1. Direct payments

Direct payments are granted to farmers as a form of basic income support decoupled from production which provides some stable income separate from market sales which are subject to volatility. To maximise profits in a decoupled environment, producers in theory need to respond to market signals producing goods as demanded by the consumer. They also contribute to providing basic public goods through greening and cross compliance (see below). The structure of the direct payment schemes in the EU (European Commission 2015a) from 2015 guarantees access by "active farmers" to compulsory schemes applicable to all MS and to voluntary schemes depending on the decision of individual MS. The new system aims for convergence of payments between and within (i.e. internal convergence) member states. Rules on active farmers include a negative list of professional business activities not eligible for direct payments without proven genuine farming activity. Active farmers rule does not apply to recipients receiving less than a certain threshold payment to be set by MS (up to a maximum of €5000).

From 2015 the schemes below were in operation:

- Compulsory Schemes (operated by all MS): Basic Payment (or Single Area Payment); Greening Payment; Young Farmers Scheme
- Voluntary schemes (MS can choose): Redistributive Payment; Support in Areas with Natural Constraints; Coupled Support; Small Farmers Scheme

All direct payments are subject to cross compliance and greening requirements.

Direct support payments are covered under EU Regulation 1307/2013 (European Commission 2013) and associated delegated acts and implementation regulations.

Regulations giving detailed rules on direct payments are:

- Regulation (EU) No 1307/2013 on direct payments under the CAP (the basic 'horizontal' regulation), in conjunction with
- Delegated Regulation (EU) No 639/2014 on direct payments under the CAP; and
- Implementing Regulation (EU) No 641/2014 on direct payments under the CAP.

The state of play on how MS have chosen to implement Direct payments is produced by the European Commission (European Commission 2016a). This will be particularly useful to Learning Areas in the HNV Link network to describe the system in place in their area. A key aspect for each LA will be to assess if any of the implementation rules at MS level take into account HNV farming systems and can be considered to be a barrier or enabler of HNV innovations in the LA.

MS also have to option to utilise a simplified small farmer's scheme (European Commission 2016b) to replace all other direct support schemes. This involves a simplification of administrative procedures, exceptions from greening and cross compliance controls. Annual payments can be up to €1,250 with calculation determined by MS.

2.2 Compulsory Schemes

MS dedicate a share (up to 70%) of the direct payments envelop to the Basic Payment Scheme (BPS) (European Commission 2016c). MS that use the Single Area Payment Scheme which is a simpler flat rate scheme can retain this system to 2020.

In addition to BPS each holding will receive a greening payment per hectare for respecting agricultural practices beneficial for climate and the environment. Thirty per cent of the national direct payments envelope must compulsorily go toward this payment.

The Young Farmers Scheme is aimed at encouraging and supporting young farmers and stipulates that BPS awarded to farmers under 40 years old and commencing agricultural activity for the first time should be topped up with an additional payment for a maximum period of 5 years (up to 2% of national envelope).

All payments above €150,000 need to be reduced by 5%. Reduction can be applied after subtraction of salaries paid by farmer from basic payment. There is an exception to this reduction where MS allocates at least 5% of the national envelope to a Voluntary Redistributive Payment Scheme. Up to 15% of the national envelope can be transferred from Pillar I Direct Payments to Pillar II Rural Development of CAP and vice versa.

2.3. Voluntary Schemes

The Redistributive payment refers to voluntary scheme where MS can take up to 30% of the national envelope and redistribute it to farmers first 30 hectares (or up to average MS farm size if greater).

Areas of Natural Constraints payment refers to voluntary mechanism whereby MS can grant an additional payment to areas with natural constraints (defined under Rural Development Rules- see below) using up to 5% of national envelope.

Under voluntary coupled support MS have the option to provide limited supports in the form of coupled payments (between 8% and 13% of national envelope) to sectors or regions where specific types or sectors undergo certain difficulties and are particularly important for economic and/or social and/or environmental reasons. There is also the possibility of providing additional 2% coupled support for protein crops. Synthesis reports on the application of voluntary coupled support per MS have been compiled by European Commission and can be downloaded at following links.

- Voluntary coupled support – Sectors mostly supported
- Voluntary coupled support – Other Sectors supported

2.4 Greening

Greening was one of the major changes incorporated into CAP reform 2013. The basic greening measures relate to maintenance of permanent grassland, crop diversification and maintenance of ecological focus areas. There is also a greening equivalency system which aims to recognise environmentally beneficial practices already in place. This is based on MS Rural Development Plan (RDP) agri-environment schemes or certification schemes. It aims to make the direct payment system

more environmentally friendly. A review of greening by the EU Commission took place after year 1 of implementation (European Commission 2016d) and together with its five annexes provides a comprehensive overview of the implementation of greening per member state in relation to administrative burden; impact on "level playing field" for farmers; and impact on production potential. It does not contain an assessment of the environmental impact of the policy which is scheduled for completion in 2017, with first overall review of performance of CAP expected by the end of 2018.

3.5 Cross compliance

Cross compliance refers to certain rules that farmers in receipt of direct payments are required to adhere to. These rules refer to food safety, animal health, plant health, climate, environment, animal welfare and the maintenance of farmland in a minimum condition. Cross compliance is made up of two components – statutory management requirements (SMRs) and good agricultural and environmental conditions (GAEC) (See Appendix B).

GAEC is specific to farmers receiving CAP support covering a set of standards designed to:

- prevent soil erosion: Minimum soil cover, Minimum land management;
- maintain soil organic matter and soil structure: Maintenance of soil organic matter level;
- biodiversity and ensure a minimum level of maintenance: Retention of landscape features including ban on cutting hedges and trees during the bird breeding and rearing season;
- protect and manage water: Establishment of buffer strips along water courses, authorisation on water for irrigation and protection of ground water against pollution.

(Source: http://ec.europa.eu/agriculture/direct-support/cross-compliance/index_en.htm)

SMRs include sectoral legislation in the form of directive and regulations that apply to all farmers irrespective of receipt of CAP support. These include:

- Public, animal and plant health: General Food Law, Hormones ban Directive, Regulations on identification and registration of pigs, bovine, ovine and caprine animals, Regulation on prevention, control and eradication of TSE, Regulation on plant protection products;
- Animal welfare: Directives on the protection of calves, pigs and animals kept for farming purposes;
- Environmental protection: Nitrates Directive, NATURA 2000 Directives (wild birds and habitats).

(Source: http://ec.europa.eu/agriculture/direct-support/cross-compliance/index_en.htm)

All MS must establish a farm advisory system (FAS) in the framework of CAP to advise farmers and other CAP beneficiaries to facilitate better understanding and meet EU rules. The scope of the FAS includes cross compliance, water, sustainable use of pesticides, land management and greening rules. FAS use and set up can be facilitated by RDP measures (pillar II below). An evaluation report on farm advisory system implementation may be of use to LA co-ordinators and is available at http://ec.europa.eu/agriculture/eval/reports/fas/index_en.htm.

2.5 Integrated administration and control system (IACS)

MS must take necessary measures to ensure that transactions covered under European Agriculture Guarantee Fund are carried out and implemented correctly. Irregularities must be prevented and appropriate actions taken if required. MS must operate an Integrated Administration and Control System (IACS) to meet this requirement. IACS covers the administration and control of applications and the IT system operated by the MS by an accredited paying agency.

"IACS consists of a number of computerized and interconnected databases which are used to receive and process aid applications and respective data. Thus it provides for:

- a unique identification system for farmers;
- an identification system covering all agricultural areas called Land Parcel Identification System (LPIS);
- an identification system for payment entitlements;
- a system for identification and registration of animals (in Member States where animal-based measures apply).

The system ensures a unique identification of each farmer as well as of all agricultural parcels of land and, if needed, of animals. The system covers also the processing of the aid applications." http://ec.europa.eu/agriculture/direct-support/iacs/index_en.htm

Regulations:

- Regulation (EU) No 1306/2013 on financing, managing & monitoring the CAP
- Delegated Regulation (EU) No 640/2014 on the integrated administration & control scheme
- Implementing Regulation (EU) No 809/2014 on the integrated administration & control system

3 CAP Pillar I Common Market Organisation (CMO)

CMO is a set of rules regulating agricultural markets across the EU. The EU Commission notes that it builds on the rules for the common market in goods and services with specific policy tools aimed at improving the functioning of agricultural markets (http://ec.europa.eu/agriculture/markets/index_en.htm). The CMO's legal basis is Regulation (EU) No 1308/2013. The CMO Regulation lays down rules for the organisation of markets and trade in agricultural products in the EU and encourages cooperation between producers.

The CMO set out the parameters for intervening in agricultural markets (e.g. public intervention and private storage) and for providing sector specific support. It includes rules on marketing (quality standards, geographical indication, labelling) and the functioning of producer and interbranch organisations as well as issues relating to international trade and competition rules (http://ec.europa.eu/agriculture/markets/index_en.htm).

3.1 Sector specific supports

Arable crops: Arable crops are now fully decoupled and integrated into the CMO with EU policy limited to two main areas i.e. intervention and trade measures. Intervention for cereals is used only in cases of real necessity to protect farmer from low market process. An import regime controls the import of cereals and rice into EU subject to import licenses and payment of tariffs subject to WTO commitments (see http://ec.europa.eu/agriculture/cereals/index_en.htm).

Fruit and vegetables: Growers are encouraged to join producer organisations based on national operational programmes and there are marketing standards for certain products to support product quality. Apart from general market standards there are 10 products covered by specific market standards i.e. apples; citrus fruits, kiwifruit, lettuces, peaches and nectarines, pears, strawberries, sweet peppers, table grapes and tomatoes. 16 Products are exempted from market standards (see http://ec.europa.eu/agriculture/fruit-and-vegetables/marketing-standards/index_en.htm#list-of-products-exempted-to-comply-with-the-general-marketing-standard) while national authorities can exempt products (e.g. misshapen, undersized) from specific standards if they are labelled "products intended for processing" or "for animal feed" or other equivalent wording. Support is available for crisis prevention/management measures under national operational programmes (country dependent) and includes 6 types of actions: market withdrawal; green harvesting/non-harvesting; promotion and communication; training measures, harvest insurance; support for the administrative costs of setting up mutual funds and help to secure bank loans. Schools fruit scheme has been created to promote fruit and vegetable consumption by children. For various policy reports on fruit and vegetable sector (see http://ec.europa.eu/agriculture/fruit-and-vegetables/policy-reports/index_en.htm) .

Olives: There is a specific EU action plan for the olive oil sector dealing with quality and control; restricting of the sector; structuring of the chain; promotion; International Olive Council and Competition with third countries. See http://ec.europa.eu/agriculture/olive-oil/action-plan_en.pdf.

Wine: the planted rights regime ended in December 2015 and a new system for the management of vine planting is established at EU level from 2016-2030 as an authorization scheme for vine planting see http://ec.europa.eu/agriculture/wine/production-potential/index_en.htm. In the 2013 reform, many of the measures introduced during the 2008 wine reform remained in place i.e. promotion in third countries; restructuring and conversion of vineyards; green harvesting; mutual funds; harvest insurance; investments; by product distillation see http://ec.europa.eu/agriculture/wine/reforms/index_en.htm.

Beef, veal, poultry, pig meat, sheep meat and goat meat: These are covered under common market organization regulations. EU reg No 1249/2008 lays down detailed rules on the implementation of the Community scales for the classification of beef, pig and sheep carcasses and reporting of prices http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32008R1249. Exceptional market support measures covered under article 220 of CMO regs 1308/2013.

Milk and milk products: Milk sector integrated into CMO (Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products) where the main market tools are market intervention; rules concerning marketing and production; trade with third countries. Milk quotas expired on the 1st of April 2015. A school milk scheme is also available providing aid for supply of milk to schools. Milk and milk products for human consumption must comply with explicit marketing standards article 78 1308-/2013

3.2 Marketing of agricultural products

EU marketing standards are laid down in Council regulation (EC) no 1234/2007 relating to product definitions and categories, minimum characteristics and labelling requirements to be respected on the EU Single market.

The range of EU agricultural product quality schemes can be viewed at http://ec.europa.eu/agriculture/quality/index_en.htm and include Protected Designation of Origin (PDO), Protected Geographic Indication (PGI) and Traditional Speciality Guaranteed (TSG). The DOOR (Database if Origin and Registration) database contains products registered as PDO, PGI and TSG.

Detailed rules on the labelling of agricultural products are available at http://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation/index_en.htm. This is governed by EU Regulation No 1169/2011. Origin labelling rules for fresh, chilled and frozen meat of swine, sheep, goats and poultry came into force on the 1st of April 2015 and are governed by EU Regulation No 1337/2013.

4 CAP Pillar II Rural Development

The EU Rural Development Policy often referred to as the second pillar of CAP complements the direct payments and CMO which are generally referred to as the first pillar. It is designed to meet a wide range of economic, environmental and social challenges in rural areas and shares a number of objectives with other European Structural and Investment Funds (ESIF) (http://ec.europa.eu/agriculture/rural-development-2014-2020/index_en.htm). The European Agricultural Fund for Rural Development (EAFRD) is worth €100 billion from 2014-2020 with a further €61 billion in co-financing by MS. There are 118 Rural Development Programmes (RDPs) across the 28 member states. 20 of these are single national programmes with 8 member states having two or more regional programmes.

In drawing up their RDPs which are governed by the rural development regulations, delegated acts and implementing acts, MS territories need to address at least four of the following 6 EU priorities for rural development:

- fostering knowledge transfer and innovation in agriculture, forestry and rural areas
- enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management
- promoting food chain organisation, animal welfare and risk management in agriculture
- restoring, preserving and enhancing ecosystems related to agriculture and forestry
- promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors
- promoting social inclusion, poverty reduction and economic development in rural areas

Each priority is divided into a number of focus areas and each MS or regions within the MS sets quantified targets against the focus areas; the measures to achieve these targets and funding

allocations for each. 30% of RD funding must be dedicated to environment and climate change measures and 5% to LEADER.

Rural Development 2014 -2020 is part of a broader EU investment strategy and in order to ensure more complementarity between different European Structural and Investment Funds all MS must draw up partnership agreements. These partnership agreements are strategic plans with investment priorities across the five ESIFs (i.e. The European Rural Development Fund; The European Social Fund; The Cohesion Fund; The European Maritime and Fisheries Fund; and The European Agricultural Fund for Rural Development). The partnership agreements are then implemented through the various operational programmes setting out the investment priorities and objectives into various actions covering MS/regions. For evaluation reports of Rural Development Policy see http://ec.europa.eu/agriculture/evaluation/rural-development-reports/index_en.htm

4.1 Rural Development Regulations

Rural Development is governed by the main regulations plus delegated acts plus implementation acts (See Table 1). Delegated acts supplement or amend legislative acts in relation to elements that are not considered essential, while implementing acts are adopted by the Commission to ensure that legislative acts are applied in a uniform way in all Member States.

While not limiting measures, key articles under Regulation No 1305/2013 which enable measures to be designed to support the sustainable management of HNVf under MS RDPS include:

- Article 8 Thematic sub-programmes
- Article 14 Knowledge transfer and information actions
- Article 15 Advisory services, farm management and farm relief services
- Article 17 Investments in physical assets
- Article 19 Farm and business development
- Article 27 Setting up of producer groups
- Article 28 Agri-environment – climate
- Article 29 Organic Farming
- Article 30 Natura 2000 and Water Framework Directive payments
- Article 31-32 Payments to areas facing natural or other specific constraints
- Article 35 Co-operation
- Article 42–44 LEADER
- Article 55-57 EIP for Agricultural Productivity and Sustainability

In each LA it would be useful to investigate if there are any innovative measures of relevance to HNV farmland designed and implemented under these various articles. Factsheets on 118 RDPs and overview of RDPs 2014-2020 are available at http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/index_en.htm.

Table 1: Rural Development Legislation.

Main Regulations			
Regulation (EU) 1303/2013 of the European Parliament and of the Council laying down common provisions on the ERDF, the ESF, The Cohesion Fund, the EAFRD and the EMFF covered by the Common Strategic Framework and laying down general provisions on the European Regional Funds, the ESF and the Cohesion Fund repealing Regulation (EC) 1083/2006. The "Common Provisions" Regulation provides for a shared set of basic rules applying to all European Structural and Investments Funds (ESIFs) including the EAFRD.	Regulation (EU) 1305/2013 of the European Parliament and of the Council on support for rural development by the EAFRD. This is the basic act that sets out the specific rules relating to the EAFRD for rural development programming.	Regulation (EU) 1306/2013 of the European Parliament and of the Council on the financing, management and monitoring of the CAP. The so-called "Horizontal" Regulation provides the financial management rules for the two CAP funds, the European Agricultural Guarantee Fund (EAGF) which finances market measures and direct payments, and the EAFRD which finances support to rural development. It brings together the rules on cross compliance, farm advisory systems and monitoring and evaluation of the CAP.	Regulation (EU) nº 1310/2013 of the European Parliament and of the Council laying down certain transitional provisions on support for rural development by the EAFRD. This Regulation defines transitional rules in order to bridge the gap between two multi-annual programming periods.
Delegated acts and implementing acts			
Commission Delegated Regulation (EU) No 807/2014 of 11 March 2014 supplementing Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the EAFRD and introducing transitional provisions.	Commission Implementing Regulation (EU) No 808/2014 of 17 July 2014 laying down rules for the application of Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the EAFRD.	Commission Delegated Regulation (EU) No 640/2014 of 11 March 2014 supplementing Regulation (EU) No 1306/2013 of the European Parliament and of the Council with regard to the IACS and conditions for refusal or withdrawal of payments and administrative penalties applicable to direct payments, rural development support and cross compliance.	Commission Implementing Regulation (EU) No 809/2014 of 17 July 2014 laying down rules for the application of Regulation (EU) No 1306/2013 of the European Parliament and of the Council with regard to the IACS, rural development measures and cross compliance

4.2 Organic Farming Regulations

Organic farming governed by EC Regulation No. 834/2007 and implementation regulation No. 889/2008 which sets out overarching rules on production, distribution, control and labelling of organic produce. Regulations include detailed annexes on products permitted in organic farming, such as fertilisers, soil conditioners and pesticides; minimum requirements on the size of housing and exercise areas for organic livestock; non-organic animal feed, feed additives and processing aids for the production of compound feed and premixtures permitted in organic farming; non-organic ingredients, additives and processing aids permitted in organic food production (including yeast production); products for cleaning and disinfection and requirements on the Community logo.

Further info on the legal framework for the organic sector can be found at http://ec.europa.eu/agriculture/organic/eu-policy/eu-rules-on-production/legal-frame/index_en.htm.

4.3 Food and feed hygiene

There is an EU legal framework in place to increase food safety in MS. These target biological hazards such as bacteria, viruses, parasites, prions and biotoxins. The framework includes a co-ordinated approach to food hygiene; monitoring programme for zoonotic agents throughout food chain; control programmes for salmonella and other food borne zoonotic diseases; microbiological criteria for assessment of safety and quality of foodstuffs; and harmonisation of measures for control of Transmissible Spongiform Encephalopathies. Imported food needs to comply with same standards. (European_Commission 2016e). Rules on food hygiene are contained within EC Regulations No. 852/2004, 853/2004 and 854/2004. A Commission report from 2009 contains details of experiences and difficulties encountered in MS with implementation (see http://ec.europa.eu/food/safety/docs/biosafety-hygiene-staff_working_doc_part1_en.pdf). There is flexibility in rules in relation to certain establishments such as micro enterprises (see http://ec.europa.eu/food/safety/docs/biosafety-hygiene-faq_all_business_en.pdf and http://ec.europa.eu/food/safety/docs/biosafety-hygiene-faq_all_public_en.pdf).

4.4 Animal health and welfare

Animal health

In March 2016 the EU parliament and the Council adopted the EU "Animal Health Law" (EU Regulation No 429/2016. (FAQ doc http://ec.europa.eu/food/animals/docs/ah-regulation-qanda_ahl_proposal.pdf). It covers the principle rules on requirements for disease prevention and preparedness; disease awareness; biosecurity; traceability of animals and where necessary products thereof; intra-EU movements and entry into the EU of animals and animal products; surveillance; disease control and eradication; and emergency measures. It does not cover rules on animal welfare but specifically recognises the link between health and welfare and requires animal welfare to be taken into account when considering impacts and measures on animal disease prevention and control. Many of the rules have been around for decades but a large number of legal acts are now integrated into the one regulation. The DG Agri website(http://ec.europa.eu/food/animals/health/regulation/index_en.htm) states that

- The large number of legal acts are streamlined into a single law

- Simpler and clearer rules enable authorities and those having to follow the rules to focus on key priorities i.e. preventing and eradicating disease
- Responsibilities are clarified for farmers, vets and others dealing with animals
- The new rules allow greater use of new technologies for animal health activities - surveillance of pathogens, electronic identification and registration of animals
- Better early detection & control of animal diseases, including emerging diseases linked to climate change, will help to reduce the occurrence and effects of animal epidemics
- There will be more flexibility to adjust rules to local circumstances, and to emerging issues such as climate and social change
- It sets out a better legal basis for monitoring animal pathogens resistant to antimicrobial agents supplementing existing rules and two other proposals currently being negotiated in the European Parliament and Council, on veterinary medicines and on medicated feed

Animal welfare

The general rule for the protection of animals kept for farming purposes including fish, reptiles and amphibians are covered under Council Directive 98/58/EC and are largely based on the 1976 European Convention for the Protection of Animals kept for Farming Purposes (http://ec.europa.eu/food/animals/docs/aw_european_convention_protection_animals_en.pdf) which reflects five freedoms:

- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain, injury and disease
- Freedom to express normal behaviour
- Freedom from fear and distress

Animal welfare is also enshrined in the Lisbon Treaty which states under Article 13 that:

"In formulating and implementing the Union's agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage."

EU animal welfare legislation lays down minimum standards and MS is free to adopt more stringent rules provided they are in accordance with the Lisbon Treaty.

The enforcement of animal welfare legislation falls within the principle of subsidiarity, which means that Member States are responsible for day to day enforcement through their national legislation and control activities; transposition of directives into national legislation and the implementation of EU rules at national level. The European Commission is responsible for providing appropriate information and where necessary training on EU legislative requirements; ensuring that EU

legislation is properly implemented and enforced and, in extreme cases, taking action against Member States that have failed to implement legal requirements (See http://ec.europa.eu/food/animals/welfare/legislative_aspects/index_en.htm).

Identification

EU rules on the identification of animals are aimed at locating and tracing animals for veterinary purposes; the traceability of meat for animal and public health reasons and the management of livestock premiums. A range of systems of identification and registration of animals dependent on the needs of different species and include visual or electronic identifiers, registers or passports. There are a number of derogations and specific measures of potential relevance to HNV farming systems and need to be investigated to see how this is implemented at LA level and any specific HNV innovations. See Appendix C for details.

4.5 Plant health

4.5.1 GMO

The EU GMO legal framework aims to:

- Protect human and animal health and the environment by introducing a safety assessment of the highest possible standards at EU level before any GMO is placed on the market.
- Put in place harmonised procedures for risk assessment and authorisation of GMOs that are efficient, time-limited and transparent.
- Ensure clear labelling of GMOs placed on the market in order to enable consumers as well as professionals (e.g. farmers, and food feed chain operators) to make an informed choice.
- Ensure the traceability of GMOs placed on the market

The main directives and regulations governing GMOs are:

- Directive 2001/18/EC on the deliberate release of GMOs into the environment
- Regulation (EC) 1829/2003 on genetically modified food and feed
- Directive (EU) 2015/412 amending Directive 2001/18/EC as regards the possibility for the Member States to restrict or prohibit the cultivation of GMOs in their territory
- Regulation (EC) 1830/2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms
- Directive 2009/41/EC on contained use of genetically modified micro-organisms. Regulation (EC) 1946/2003 on transboundary movements of GMOs

Various reports and studies can be found at http://ec.europa.eu/food/plant/gmo/reports_studies/index_en.htm

4.5.2 Pesticides

EU rules for the sustainable use of pesticides to reduce the risks and impacts of pesticide use on human health and the environment is covered by Directive 2009/12/EC. The main actions required by member states are:

- The adoption of national actions plans (http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm).
- Establishment of competent authorities and certification systems.
- Training of professional pesticide users, distributors and advisors.
- Information and awareness raising to inform general public and systems in place for information gathering on acute and chronic poisoning.
- Aerial spraying prohibits except under strict conditions after warning people.
- MS must minimize or ban use of pesticides in critical areas for environmental and health reasons.
- All application equipment to be inspected at least once by 2016.
- Promotion of integrated pest management and of alternative approaches or techniques such as non-chemical alternatives to pesticides.

4.5.3 Plant health and biosecurity

EU rules aim to protect crops, fruits, vegetables, flowers, ornamentals and forests from harmful pests and diseases by preventing their introduction into the EU or their spread within the EU. This helps to contribute to sustainable agricultural and horticultural production through plant health protection and contribute to the protection of public and private green spaces, forests and the natural landscape (European Commission, 2016f).

The basis of the legislation is Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. The Directive is based on the provisions laid down under the International Plant Protection Convention and is supplemented by a number of Control Directives and Emergency Measures. The EU regulates the introduction of plants and plant products into the EU; regulates the movement of plants and plant products within the EU; imposes eradication and containment measures in case of outbreaks, and co-finances them and places obligations on countries outside the EU which want to export plants or plant products to the EU.

5 Agriculture and Environment

Environmental concerns are integrated into the CAP across both Pillar I and II. In Pillar I, as we already outlined, there are mandatory greening measures and cross compliance measures related to the environment to ensure statutory requirements are adhered to and that basic GAEC are met. Under Pillar II there are a number of targeted aid measures to promote environmentally sustainable farming practices such as agri-environment schemes and Natura 2000 payments (European_Commission, 2013b). The overall environmental objective of CAP is to promote sustainable management of natural resources and climate action, with a focus on greenhouse gas emissions, biodiversity, soil and water (EU Reg No 1306 article 110).

5.1 Climate

Agriculture in general is highly exposed to climate change due to the direct effect of precipitation and temperature on production. Agriculture also contributes to the release of greenhouse gases (mainly methane from livestock production and nitrous oxide from organic and mineral fertilisers), a key contributor to climate change. Conversely, agriculture has the potential to contribute to climate change mitigation through emissions reductions and carbon sequestration which vary according to land use intensities across the spectrum of EU agriculture.

The main predicted effects of climate change are changes in rainfall patterns, rising temperatures and extremes events across the EU (Fig.1) (European Commission 2015b).

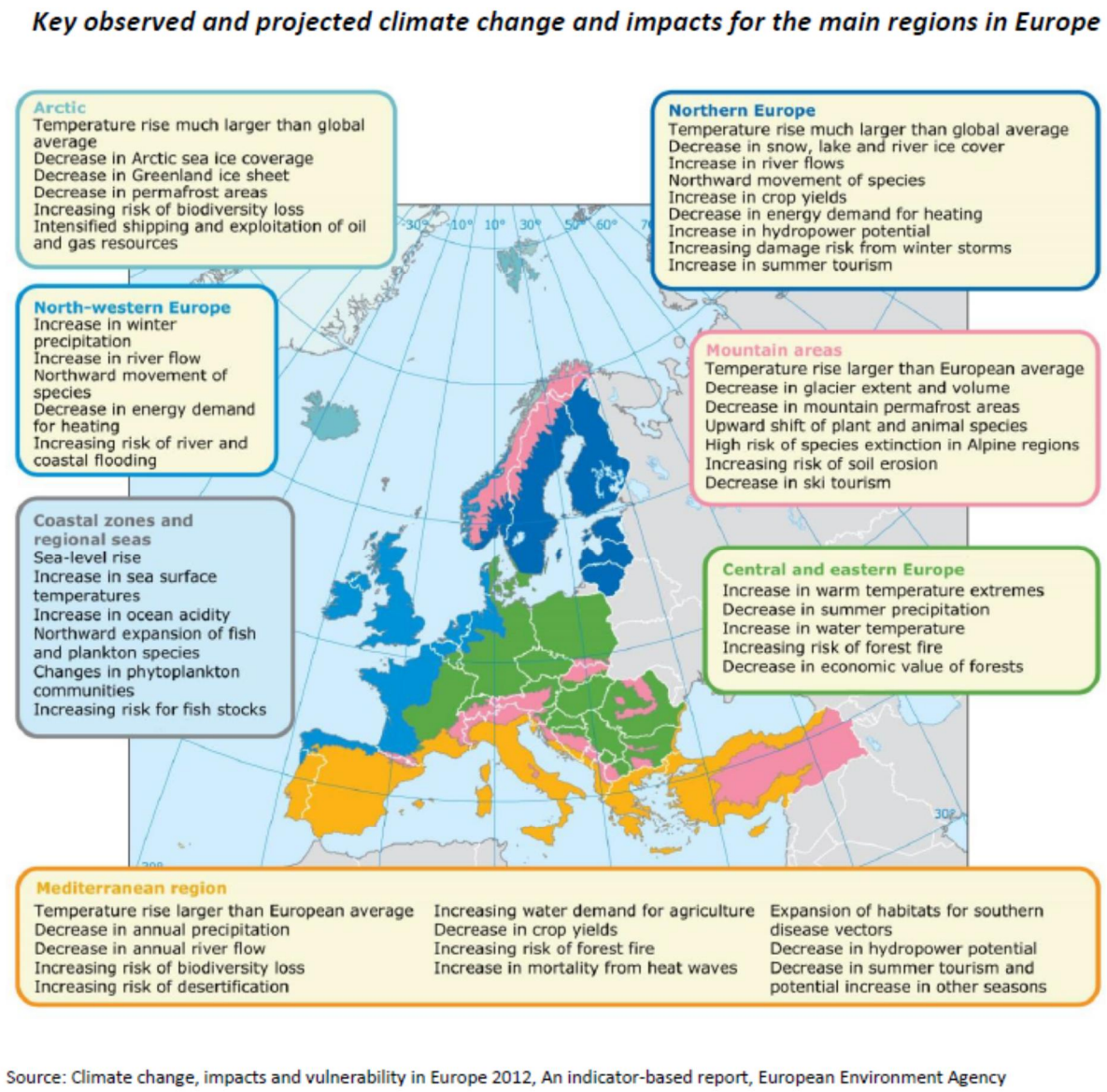


Figure 1. Observed and projected climate change impacts for regions of Europe

Climate action including adaption to climate change is a core element of CAP. Core instruments in current CAP include cross compliance and greening in Pillar 1 and one of the priorities for rural development directly concerns climate change i.e. “Promoting resource efficiency and supporting a

shift towards a low carbon and climate resilient economy in the agriculture, food and forestry sectors." Innovation, climate change and environment are also cross cutting objectives in EU Rural Development Policy and must be integrated into all MS strategies and instrument choices (European_Commission, 2016g).

Within the 2020 climate and energy package there are key targets for reduction in greenhouse gas emissions (20% on 1990 levels); renewable energy (20%) and improvements in energy efficiency (20%). Binding national emission reduction targets until 2020 to cover non emission trading system sectors including agriculture are set under EU effort sharing decision. These are set as percentage change from 2005 levels (European_Commission, 2016h). Member states must now define and implement national policies and measures in agriculture (inter alia) to limit emissions.

Accounting rules and changes in same for land use, land use change and forestry (LULUCF) in the EU are key (European_Commission, 2016i, CEC, 2013)

5.2 Biodiversity

The EU Biodiversity strategy sets out 6 targets and 20 actions to halt the loss of biodiversity and ecosystem services in the EU by 2020 (European Commission 2011). Target 3 in particular is concerned with sustainable agriculture and forestry. The strategy highlights the benefits that biodiversity brings to the sectors and states that current efforts are not sufficient to halt the decline of biodiversity. Target 3 goals for agriculture are to maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP by 2020. This is to ensure the conservation of biodiversity and to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhanced sustainable management.

The Biodiversity Strategy (European Commission 2011) identifies 5 actions to meet the above targets which are:

- Action 8: Enhance CAP direct payments to reward environmental public goods such as crop rotation and permanent pastures; improve cross-compliance standards for GAEC (Good Agricultural and Environmental Conditions) and consider including the Water Framework in these standards
- Action 9: Better target Rural Development to biodiversity needs and develop tools to help farmers and foresters work together towards biodiversity conservation
- Action 10: Conserve and support genetic diversity in Europe's agriculture
- Action 11: Encourage forest holders to protect and enhance forest biodiversity
- Action 12: Integrate biodiversity measures such as fire prevention and the preservation of wilderness areas in forest management plans

Biodiversity preservation is dealt with in the CAP mainly through RDP measures such as agri-environment and Natura 2000 payments. Biodiversity requirements are also included in cross-compliance under pillar I as statutory management requirements related to the Birds and Habitats Directives. One of the 6 priorities for rural development directly concerns biodiversity i.e. restoring,

preserving and enhancing ecosystems related to agriculture and forestry, with a focus on the following areas:

a) restoring, preserving and enhancing biodiversity, including in Natura 2000 areas, and in areas facing natural or other specific constraints, and high nature value farming, as well as the state of European landscapes
b) improving water management, including fertiliser and pesticide management
c) preventing soil erosion and improving soil management.

There is also a specific programme on genetic resources in agriculture which is targeted at the conservation, characterization, collection and sustainable use of genetic resources (European Commission, 2013c)

The Mid-term Review of Biodiversity Strategy (European Commission 2015c) highlights that biodiversity loss and degradation of ecosystem services as compared to EU 2010 biodiversity baseline have continued. Specifically, in relation to Target 3, greater efforts are needed to conserve and enhance biodiversity in agricultural areas. The report also highlights that opportunities for targeted measures available in CAP need to be implemented by MS and that local successful examples need to be implemented more broadly. Intensification and land abandonment are identified as key pressures on biodiversity from agriculture. Considering that agriculture and forestry together cover 70% of the land use in EU, coherent policies underpinned by adequate funding are needed to meet biodiversity targets (European Commission 2015c). The call for coherent policies, improved implementation and targeting of resources are further echoed in a 2016 resolution of the European Parliament (European Parliament 2016).

5.3 Water

The range of water-related legislation in the EU is directly linked to the Water Framework Directive (2000/60/EC) which establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. As part of this legislation river basin management plans must be implemented across the EU with environmental objectives set to ensure that all water achieve "good status" (as defined under the Directive) by 2015.

Water is dealt with in the CAP mainly through RDP measures such as agri-environment and Water Framework Directive payments. Water requirements are also included in cross compliance under pillar I as water-related statutory management requirements and GAEC e.g. Nitrates Directive (See Appendix B). Overall water-related CAP measures are concerned with both water quality and quantity with supports for (inter alia) investments to conserve water and protect water quality (Article 30 EU Reg No 1305/2013) and improvements in irrigation techniques and infrastructure (Article 46 EU Reg No 1305/2013).

Priority 4b for rural development directly concerns improving water management, including fertiliser and pesticide management. The main directives and regulations governing water and related to agriculture are:

- Water Framework Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.
- Groundwater Directive 2006/118/EC
- EU Floods Directive 2007/60/EC on the assessment and management of flood risks

- Nitrates Directive 61/676/EEC concerning the protection of waters caused by nitrates from agricultural sources

5.4 Soil

There is an EU Soil thematic strategy (European Commission, 2016i). Proposals for a Soils Framework Directive are with the Council but were blocked by a minority of members of the Environment Council in 2010. The proposed Directive sets out common principles for protection of soils across EU (CEC, 2012). Soil protection is integrated into cross compliance in CAP (See Appendix 2- GAEC 4-6) relating to limiting erosion, organic matter status and minimum soil cover. Priority 4c for rural development directly concerns preventing soil erosion and improving soil management.

6 Research and Innovation

The importance of research and innovation to the agricultural sector from a growth and development point of view has been acknowledged by the European Commission (European_Commission 2011b). Research is an integral part of the Agricultural Knowledge and Innovation System (AKIS). The European Commission want to ensure that research activities respond to on-the-ground needs and that results are taken up by farmers and foresters. This has prompted the EU to bring science and practice closer together with a view to having a more demand-driven research policy and a more evidence-based agricultural policy. (European_Commission, 2016k). CAP itself does not fund research but the EU Framework Programme for Research and Innovation has specific themes that cater for agriculture through the Horizon 2020 societal challenge 2 which covers the Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy theme (European_Commission, 2016l). A Europe 2020 initiative put forward European Innovation Partnerships as a new approach to EU research and innovation. EIPs are challenge-driven, focusing on societal benefits and a rapid modernisation of the associated sectors and markets (European_Commission, 2016m).

7 References

CEC (2012). "The implementation of the Soil Thematic Strategy and ongoing activities " Official Journal of the European Union.

CEC (2013). Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities. Official Journal of the European Union. Brussels, Commission of the European Communities.

EUR-lex (2016). "Directory of European Union legislation." Retrieved 17-08-2016, from http://eur-lex.europa.eu/browse/directories/legislation.html?root_default=CC_1_CODED%3D03&classification=in-force&displayProfile=allRelAllConsDocProfile&locale=en.

European Commission (2011) Communication from the Commission of the European Parliament, The Council, The Economic and Social Committee and the Committee of the Regions.Our life insurance, our natural capital: an EU biodiversity strategy to 2020, Brussels: European Commission.

European_Commission (2011b). COMMISSION STAFF WORKING PAPER : IMPACT ASSESSMENT Common Agricultural Policy towards 2020 ANNEX 7 Brussels, European Commission.

European Commission (2013) 'Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 on establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009'.

European_Commission (2013b). Agricultural Policy Perspectives Brief; Overview of CAP Reform 2014-2020. Brussels, European Commission.

European_Commission (2013c). Agricultural Genetic Resources - from conservation to sustainable use Brussels, European Commission.

European Commission (2015a) 'Direct Aid Schemes', 4. [online], available: http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/basic-payment-scheme_en.pdf

European_Commission (2015b). "EU agriculture and climate change." from http://ec.europa.eu/agriculture/climate-change/factsheet_en.pdf.

European Commission (2015c) Report to the Commission to the European Parliament and the Council. The Mid-Term Review of the EU Biodiversity Strategy to 2020, Brussels: European Commission.

European Commission (2016a) Direct payments 2015-2020 Decisions taken by Member States: State of play as at June 2016. Information note. [online], available: http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/simplementation-decisions-ms-2016_en.pdf

European Commission (2016b) 'The Small Farmers Scheme', 11. [online], available: http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/small-farmers-scheme_en.pdf

European Commission (2016c) 'Direct Payments- Basic Payment Scheme', [online], available: http://ec.europa.eu/agriculture/direct-support/direct-payments/docs/basic-payment-scheme_en.pdf

European Commission (2016d) Commission Staff Working Document. Review of Greening after one year, Brussels. [online], available: http://ec.europa.eu/agriculture/direct-support/pdf/2016-staff-working-document-greening_en.pdf

European_Commission (2016e). "Biological safety." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/food/safety/biosafety/index_en.htm.

European_Commission (2016f). "Plant health and biosecurity." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/food/plant/plant_health_biosecurity/index_en.htm.

European_Commission (2016g). "2050 low-carbon economy." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/strategies/2050/index_en.htm.

European_Commission (2016h). "Effort Sharing Decision." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/effort/index_en.htm.

European_Commission (2016i). "LULUCF in the EU." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/clima/policies/forests/lulucf/documentation_en.htm.

European_Commission (2016j). "Soil." Retrieved 17-08-2016, 2016, from http://ec.europa.eu/environment/soil/three_en.htm.

European_Commission (2016k). "Agricultural research and innovation." Retrieved 18-08-2016, 2016, from http://ec.europa.eu/agriculture/research-innovation/index_en.htm.

European_Commission (2016l). "Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy ". Retrieved 18-08-2016, 2016, from http://ec.europa.eu/programmes/horizon2020/en/h2020-section/food-security-sustainable-agriculture-and-forestry-marine-maritime-and-inland-water.

European_Commission (2016m). "European Innovation Partnerships ". Retrieved 18-08-2016, 2016, from http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=eip

European Parliament (2016) Mid-term review of the EU's Biodiversity Strategy. European Parliament resolution of 2 February 2016 on the mid-term review of the EU's Biodiversity Strategy (2015/2137(INI)).

Appendix A: Regulations, Directives and other acts explained

(Source: http://europa.eu/eu-law/decision-making/legal-acts/index_en.htm)

The aims set out in the EU treaties are achieved by several types of legal act. Some are binding, others are not. Some apply to all EU countries, others to just a few.

Regulations

A "regulation" is a binding legislative act. It must be applied in its entirety across the EU

Directives

A "directive" is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals.

Decisions

A "decision" is binding on those to whom it is addressed (e.g. an EU country or an individual company) and is directly applicable.

Recommendations

A "recommendation" is not binding. A recommendation allows the institutions to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed.

Opinions

An "opinion" is an instrument that allows the institutions to make a statement in a non-binding fashion, in other words without imposing any legal obligation on those to whom it is addressed. An opinion is not binding. It can be issued by the main EU institutions (Commission, Council, Parliament), the Committee of the Regions and the European Economic and Social Committee. While laws are being made, the committees give opinions from their specific regional or economic and social viewpoint.

Appendix B CAP Rules on Cross Compliance

Copy of Annex II of EU Regs 1306/2013

RULES ON CROSS-COMPLIANCE PURSUANT TO ARTICLE 93

SMR: Statutory management requirement

GAEC: Standards for good agricultural and environmental condition of land

Area	Main Issue	Requirements and standards		
Environment, climate change, good agri-cultural condition of land	Water	SMR 1	Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1)	Articles 4 and 5
		GAEC 1	Establishment of buffer strips along water courses ([1])	
		GAEC 2	Where use of water for irrigation is subject to authori-sation, compliance with authorisation procedures	
		GAEC 3	Protection of ground water against pollution: prohibition of direct discharge into groundwater and measures to prevent indirect pollution of groundwater through discharge on the ground and percolation through the soil of dangerous substances, as listed in the Annex to Directive 80/68/EEC in its version in force on the last day of its validity, as far as it relates to agricultural activity	
	Soil and carbon stock	GAEC 4	Minimum soil cover	
		GAEC 5	Minimum land management reflecting site specific conditions to limit erosion	
		GAEC 6	Maintenance of soil organic matter level through appro-priate practices including ban on burning arable stubble, except for plant health reasons ([2])	
	Biodiversity	SMR 2	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conser-vation of wild birds (OJ L 20, 26.1.2010, p. 7)	Article 3(1), Article 3(2)(b), Article 4(1), (2) and (4)
		SMR 3	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (OJ L 206, 22.7.1992, p. 7)	Article 6(1) and (2)
	Landscape, minimum level of maintenance	GAEC 7	Retention of landscape features, including where appro-priate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, as an option, measures for avoiding invasive plant species	
Public health, animal health and plant health	Food safety	SMR 4	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety (OJ L 31, 1.2.2002, p. 1)	Articles 14 and 15, Article17(1) ([3]) and Articles 18, 19 and 20

Area	Main Issue	Requirements and standards		
		SMR 5	Council Directive 96/22/EC of 29 April 1996 concerning the prohibition on the use in stockfarming of certain substances having a hormonal or thyrostatic action and beta-agonists, and repealing Directives 81/602/EEC, 88/146/EEC and 88/299/EEC (OJ L 125, 23.5.1996, p. 3)	Article 3(a), (b), (d) and (e) and Articles 4, 5 and 7
	Identification and registration of animals	SMR 6	Council Directive 2008/71/EC of 15 July 2008 on identification and registration of pigs (OJ L 213, 8.8.2005, p. 31)	Articles 3, 4 and 5
		SMR 7	Regulation (EC) No 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation (EC) No 820/97(OJ L 204, 11.8.2000, p. 1)	Articles 4 and 7
		SMR 8	Council Regulation (EC) No 21/2004 of 17 December 2003 establishing a system for the identification and registration of ovine and caprine animals and amending Regulation (EC) No 1782/2003 and Directives 92/102/EEC and 64/432/EEC (OJ L 5, 9.1.2004, p. 8)	Articles 3, 4 and 5
	Animal diseases	SMR 9	Regulation (EC) No 999/2001 of the European Parliament and of the Council of 22 May 2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies (OJ L 147, 31.5.2001, p. 1)	Articles 7, 11, 12, 13 and 15
	Plant protection products	SMR 10	Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (OJ L 309, 24.11.2009, p. 1)	Article 55, first and second sentence
Animal welfare	Animal welfare	SMR 11	Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves (OJ L 10, 15.1.2009, p. 7)	Articles 3 and 4
		SMR 12	Council Directive 2008/120/EC of 18 December 2008 laying down minimum standards for the protection of pigs (OJ L 47, 18.2.2009, p. 5)	Article 3 and Article 4
		SMR 13	Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes(OJ L 221, 8.8.1998, p. 23)	Article 4

(1) The GAEC buffer strips must respect, both within and outside vulnerable zones designated pursuant to Article 3(2) of Directive 91/676/EEC, at least the requirements relating to the conditions for land application of fertiliser near water courses, referred to in point A.4 of Annex II to Directive 91/676/EEC to be applied in accordance with the action programmes of Member States established under Article 5(4) of Directive 91/676/EEC.

(2) The requirement can be limited to a general ban on burning arable stubble, but a Member State may decide to prescribe further requirements.

(3) As implemented in particular by:
- Article 14 of Regulation (EC) No 470/2009 and the Annex of Regulation (EC) No 37/2010,
- Regulation (EC) No 852/2004: Article 4(1) and Annex I part A (II 4 (g, h, j), 5 (f, h), 6; III 8 (a, b, d, e), 9 (a, c)),
- Regulation (EC) No 853/2004: Article 3(1) and Annex III Section IX Chapter 1 (I-1 b, c, d, e; I-2 a (i, ii, iii), b (i, ii), c; I-3; I-4; I-5; II-A 1, 2, 3, 4; II-B 1(a, d), 2, 4 (a, b)), Annex III Section X Chapter 1(1),
- Regulation (EC) No 183/2005: Article 5(1) and Annex I, part A (I-4 e, g; II-2 a, b, e), Article 5(5) and Annex III (1, 2), Article 5(6), and
- Regulation (EC) No 396/2005: Article 18.

Appendix C Animal Identification Requirements

Bovine animals: system of permanent identification enabling traceability from birth to date was introduced following BSE crisis in 1997. The system involves the following elements: (http://ec.europa.eu/food/animals/identification/bovine/index_en.htm)

- double eartags for each animal with an individual number
- maintaining a register on each holding (farm, market, etc.)
- bovine-passports
- a computerised database at national level with a future voluntary interoperability of bovine databases

Under the new Animal Health Law (above) bovine animals can be identified using conventional ear tags and an electronic identifies from July 2019. Details of how rules are implemented in each MS are available at http://ec.europa.eu/food/animals/identification/bovine/ms_info_en.htm.

There are a number of derogations and specific measures of relevance to HNV farming systems (see table below. Source: http://ec.europa.eu/food/animals/identification/bovine/index_en.htm)

Legislation
Basic Regulation: Regulation (EC) 1760/2000
Detailed rules on eartags, holding registers, passports: Regulation (EC) 911/2004
Control measures: Regulation (EC) 1082/2003
Sanctions: Regulation (EC) 494/98
Derogations and specific measures
Bulls intended for cultural and sporting events: Regulation (EC) 2680/99
Summer grazing in mountain areas: Commission Decision 2001/672/EC
Extension of the tagging period of certain animals kept under extensive conditions: Commission Decision 2006/28/EC
Special rules concerning extension of the tagging period of bisons: Regulation (EC) 509/1999
Extension of the maximum period laid down for the application of eartags to certain bovine animals kept in nature reserves in the Netherlands: Commission Decision 2004/764/EC
Identification of bovine animals kept for cultural and historical purposes on approved premises: Commission Regulation (EC) No 644/2005

Equine animals: identified by an identification document (passport) issue after birth and before permanently leaving the holding of birth. Have to be accompanied by identification document during movements (on foot and during transport). The systems covers the following elements:(http://ec.europa.eu/food/animals/identification/equine/index_en.htm)

- a single lifetime identification document (including a narrative and a diagrammatical description)
- A method to ensure an unequivocal link between the identification document and the equine animal (transponder, alternative methods like DNA profile and retinal scan)
- Databases maintained by the (passport) issuing bodies recording under a unique identification number the identification details relating to the animal for which an identification document was issued to the keeper who submitted the application for the identification document
- A central database

Details of how rules are implemented in each MS are available at http://ec.europa.eu/food/animals/identification/equine/ms_info_en.htm

Legislation

Basic directives: Directive 2009/156/EC and Directive 90/427/EEC for registered equidae
Identification methods of equidae: Regulation (EC) 504/2008 andRegulation (EU) 2015/262
Identification document (passport): Decision 93/623/EEC for registred equidae. Decision 2000/68/EC for the equidae for breeding and production
Medicinal Treatment document for the equidae for breeding and production: Decision 2000/68/EC

Porcine animals: system in place for identification and registration of groups of pigs covers the following elements: (http://ec.europa.eu/food/animals/identification/porcine/index_en.htm)

- Eartags or tattoos with holding number
- Maintaining a register on each holding (any place in which animals are held, kept or handled)
- A register of pigs' holdings at central national level

Legislation
Basic directive: Directive 2008/71/EC
Computerised central database: Directive 64/432/EEC

Holding register: Decision 2000/678/EC
Derogations and specific measures
Derogation for holdings with no more than one pig: Decision 2006/80/EC

Ovine and caprine animals: Rules on identification of sheep and goats are based on principle of identification of individual traceability and include the following elements: (http://ec.europa.eu/food/animals/identification/ovine_caprine/index_en.htm)

- Double identifiers
  - 1 electronic identifier: a ruminal bolus or an electronic eartag, and
  - 1 visible identifier: a conventional ear tag, tattoo or mark on the pastern)
- Maintaining a register on each holding (farm, market, etc.)
- A movement document for each movement of groups of animals
- A central register or computerised database of all holdings and movements of batches of animals at national level

Electronic tagging is voluntary where MS populations are less than 600,000 sheep or 160,000 goats where animals are not entering intra-EU trade. Details of how rules are implemented in each MS are available at http://ec.europa.eu/food/animals/identification/ovine_caprine/ms_info_en.htm.

Legislation

Basic regulation: Regulation (EC) 21/2004
Control measures: Regulation (EC) 1505/2006
Guidelines for the approval of electronic identifiers: Decision 2006/968/EC