SUPER-G

SUSTAINABLE PERMANENT GRASSLAND

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The effectiveness of policies promoting sustainable permanent grasslands across five European countries (representing five biogeographic regions): Mapping, understanding, and key stakeholder perceptions.

Deliverable 4.1c: Review of existing policies and impacts.

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Dissemination Level

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Summary

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Partners in the SUPER-*G* project are:

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University of Newcastle upon Tyne	UNEW	UK
RSK ADAS Limited	ADAS	UK
The University Court of The University of Aberdeen	UABDN	UK
Mendelova Univerzita V Brne	MENDU	CZ
Magyar Tudomanyos Akademia Okologiai Kutatokozpont	MTA ÖK	HU
Javna Ustanova Univerzitet Crne Gore Podgorica	UOM	ME
Swedish University of Agricultural Sciences	SLU	SE
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Abstract

The purpose of this report is to identify, map, and evaluate the most relevant European policies seen to influence permanent grassland (PG) management. To accomplish this, an interdisciplinary, cross-national team from the UK, Switzerland, Spain, Czech Republic, and Sweden reviewed over 50 in-depth policy frameworks. With direction from expert stakeholders and a review of the policy landscape, we identified the most relevant policy instruments influencing PGs across five different biogeographic regions in Europe (Alpine, Atlantic, Boreal, Continental, and Mediterranean).

The mapping of each country's policy mix was guided inter-alia by a 'cascade framework' to illustrate the entry points, intermediary actors, mechanisms and pathways through which policies deliver their intended effects on PGs. This entailed an in-depth analysis of publicly available government sources documenting the aims, objectives, targets, monitoring systems, outputs and outcomes of each policy instrument. In total, 24 policies were mapped using 50 different criteria, with 15 of the policies unique to the case study countries. This resulted in an extensive excel database of over 3400 unique cells containing rich qualitative data.

The excel data were coded in a consistent manner across the country teams so that they could be compared, synthesized, and used to identify patterns in the policy mix and logic of intervention. We show, for instance, that across Europe, the dominant policy logic uses regulations and incentives to influence farmer adoption of desired landscape compositions. This directly influences, but does not guarantee, the range of ecosystem services (ES) that are possible from the landscape. At the same time, we discovered a lack of policies targeting consumer demand for PG ecosystem services and only a few designed to drive sustainable PG management by directly promoting the value of PGs with beneficiaries.

To complement the policy mapping, stakeholders' assessed the perceived effectiveness of the policy mix in each country. This evaluation included over 50 interviews with key stakeholders across Europe representing government, academia, farmers, and special interests, and covered perceptions of democracy, legitimacy, relevance, efficiency and impact in relation to the effectiveness of policies relevant to the management of PG. Our findings reveal generally positive perceptions of grassland policy effectiveness across Europe, with special interest groups being the least positive and governments the most. The in-depth country case studies reveal striking similarities, as well as differences between countries and stakeholder groups, which are illustrative of the problems, challenges, and barriers confronting policy effectiveness.

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We conclude this report by offering insights and policy implications. In particular, we suggest that the following four points are taken into consideration to improve the PG policy landscape: 1) Reduce complexity and administrative burden to make policies more understandable and accessible. 2) Require stakeholder involvement when developing strategic plans and assessing policy. 3) Encourage consideration of trade-offs between PG management and ES delivery, by designing policies to explicitly target the interaction between landscape structures and ES (or target them in parallel). 4) Encourage a balance of policy logic, by moving away from targeting farmers with regulation or subsidies to manage the landscape towards targeting consumer demand for ES (through information) and the value of ES (such as direct payments for regulating and cultural services).

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Executive summary

1. Background and aims

Agricultural and related policies across Europe directly and indirectly influence the legal, economic and social context in which land management decisions are made by farmers, land managers, landowners and other stakeholders. Permanent grassland (PG)[1] is a significant agricultural land use across Europe, accounting for almost 60 million hectares (in 2013) across the 28 EU Member States, and 34% of the total Utilised Agricultural Area (UAA) (Eurostat, 2018). PG is increasingly recognised and valued for its characteristics that facilitate the production of many Ecosystem Services (ES), including water quality and quantity regulation, soil protection, carbon storage, nutrient cycling, food production, spiritual and cultural value, and recreational spaces. Decision-making stakeholders have impacts on PG not only in relation to management activities that affect the quality and quantity of ES (e.g. cutting regimes, stocking densities, seed mixes, land access, cultivation frequency), but also in relation to their decisions to convert or even abandon grasslands. Safeguarding PGs is important because their disappearance or unsustainable management would lead to losses of many significant services and benefits (Layke et al., 2012; Kroeger & Casey, 2007). However, demand for ES varies across, and even within, sectors, societies and biogeographical regions resulting in conflicts of interest among stakeholders that drive sub-optimal management decisions and contribute to a decline in PG quality and extent (Cord et al., 2017; Lee & Lautenbach, 2016; Martín-López, et al., 2014). Policies designed to support farming of PG have considerable impacts on the opportunity, viability and scope of maintaining and managing PG in agriculture, and therefore on the benefits and impacts of PG land use.

In developed agricultural systems, an increasingly common policy approach is the provision of agricultural subsidies for goods and services beyond the production of marketable food and fibre (Mattison and Norris, 2005). This is often complemented by the existence of environmental policies that aim to protect environments, species and habitats, balancing production with conservation. These policies are often designed in line with inter-governmental, national and regional political, economic and social priorities, and their success (and the way success is perceived and measured) is affected by their context, including the governance structure, networks of actors and the power dynamics of political and economic institutions.

Existing policies across Europe have contributed to improved opportunity for sustainable land management decisions in some contexts, but have often also been criticised for their complexity or inadequacy in developing expected changes. For example, the Common

[1] PG is understood as "land used permanently (for > 5 consecutive years) to grow herbaceous forage crops (sown or self-seeded), that is not included in the crop rotation scheme" (Eurostat, 2018:192).

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Agricultural Policy (CAP) of the European Union (EU) aims to support farmers through direct payments as well as incentivising adoption of greener management options and enhancing rural development. However, when evaluated in terms of policy goals, implementation costs and impacts, the CAP, has been criticized for having marginal climate or environmental impacts (Anania et al., 2015; Cortignani & Dono, 2015; Gocht et al., 2017), as well as questionable cost—benefits (Jereb et al., 2017; Pe'er et al., 2017; Solazzo, et al. 2015). Concerns have also been raised by those who believe priority setting is often skewed by influential stakeholders, or governments who sympathize more with profits or political expediency than the environment or climate (Birdlife International, 2018; Matthews, 2018a, 2018b; Robinjns, 2018). Moreover, current policy mixes often lead to controversial or unintended consequences (e.g. increased agricultural fertilizer usage, lowered employment) and therefore targeted measures need to be implemented to fit local conditions and priorities of member States (Cortignani & Dono, 2019). Research shows that CAP policy schemes prioritized within the EU vary considerably (Kleijn & Sutherland, 2003), as does their effectiveness in facilitating a balance of ES through PG management (Tscharntke, et al., 2005).

Consequently, we can learn much from differences across the EU and Europe through a deeper understanding of the policy logics in place and their outcomes and impacts on PG management and ES. It is through this evidence base that we are able to reflect on past successes and failures with the aim of improving policy (Erjavec, 2018).

The **purpose of this report** is to:

i. identify and map (describe) the most relevant policies that impact PG management across five European biogeographic regions (Atlantic, Continental/ Pannonian, Alpine, Boreal and Mediterranean)
ii. understand their policy logic; and
iii. evaluate their effectiveness; in order to
iv. provide an empirical assessment and recommendations for further research that will lead to policy improvements in relation to PG management and delivery of ES.

This report details the findings of task 4.1c (Review of existing policies and impacts) of the Horizon 2020 SUPER-*G* project, which investigates the maintenance and sustainable management of permanent grassland (PG) in Europe, and sets out to (i) increase understanding of the importance and functioning of PG; (ii) benchmark PG performance across Europe; (iii) develop integrated approaches for sustainable PG management; and (iv) develop tools and policy mechanisms inclusive of stakeholder and citizen priorities.

2. Methodology

The review was conducted between August 2018 and August 2019 by research teams in five European country contexts, aiming to represent five European biogeographic regions:

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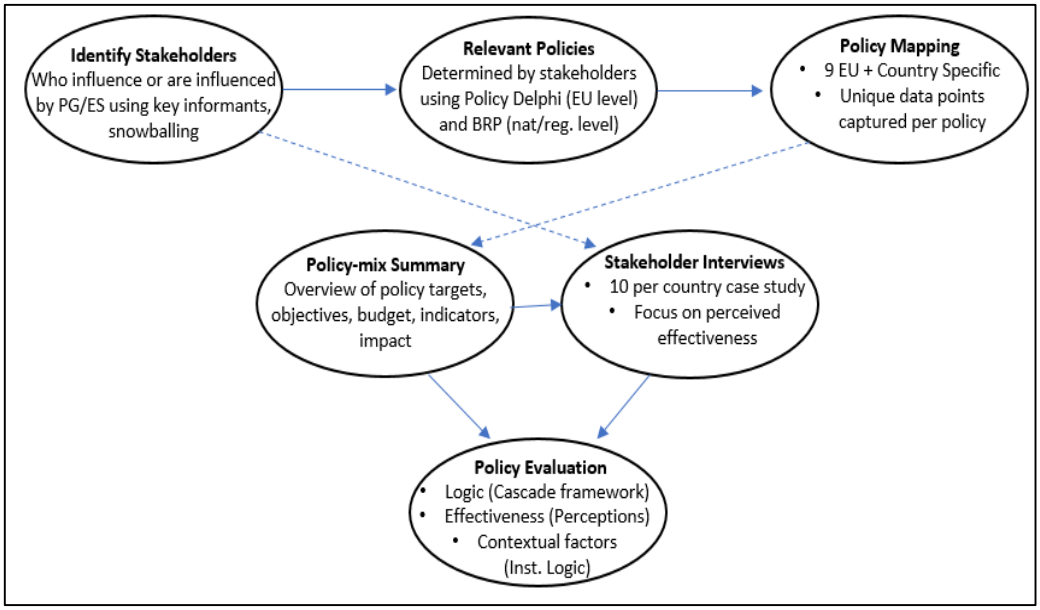
- Alpine region: Switzerland. Lead: ETH Zurich, Switzerland (ETH).
- Atlantic region: UK. Lead: University of Newcastle, UK (UNEW).
- Boreal region: Sweden. Lead: Swedish University of Agricultural Sciences, Sweden (SLU).
- Continental / Pannonian region: Czech Republic. Lead: Mendel University, Brno, Czech Republic (MENDU).
- Mediterranean region: Spain. Lead: University of Córdoba, Spain (UCO).

In each country context a multistage methodology was used to identify, map and evaluate the current policies relevant to PG management (Figure i).

Figure i. Overall methodological flowchart.



These stages included:

Identify relevant policies: Policies that affect the management decisions made about PG are often part of wider policies with varied aims and objectives. Therefore, relevant policies were identified from a combination of literature review, feedback collected from policy experts using a Delphi research method (a multi-round survey completed by experts to elicit and confirm a list of EU policies relevant to PG management), and consultation with selected experts (to identify national scale policies relevant to PG management). Relevant policies (see table i) are those that:

- Have a direct or indirect impact on PGs, i.e. that "target" PG inputs (e.g. fertilizers used), production processes (e.g. till versus no till) and outputs (e.g. various ES) (Lamarque et al., 2011).
- Have been adopted by a government body, be it at supranational (i.e. EU), national or sub-national (e.g. Cantonal, county or regional) level.

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- Are identified as such by policy experts approached via the SUPER-G project.

Table i. Policies examined in each of the five European countries (Sweden (SE), Czech Republic (CZ), United Kingdom (UK), Spain (ES), Switzerland (CH)).

Policy Examined	Investigated in
EU CAP Pillar I - Basic payments	SE, CZ, UK, ES
EU CAP Pillar I - Greening	SE, CZ, UK, ES
EU CAP Pillar I - Additional payments	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Productivity	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Environmental	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Rural	SE, CZ, UK, ES
EU Nitrates Directive	SE, CZ, UK, ES
EU Habitats Directive	SE, CZ, UK, ES
EU Climate Change Adaption Strategy	SE, CZ, UK, ES
Planning policy (Environmental Impact Assessment)	UK
Renewable energy/ forestry policy	UK
Agricultural subsidies for farmers in northern Sweden	SE
The Swedish Board of Agriculture's description of regulation, regarding the consideration of natural- and cultural values in agriculture.	SE
Cattle grazing and outdoor living	SE
Nature reserve (in addition to those in Natura 2000)	SE
The Environmental Code's rules of consideration	SE
Master Plan for the Andalusian Dehesas	ES
Direct Payments for Agriculture	CH
Spatial Planning Act	CH
Federal Act on the Protection of Nature and Cultural Heritage	CH
Federal Act on Forest	CH
Federal Act on the Reduction of CO2 Emissions	CH
Market Support for Agriculture	CH

Policy mapping and policy-mix summary: Once the policies had been identified, in-depth mapping of the policy instruments, aims, and outcomes (Figure ii) was undertaken using official government documents and evaluations. The results were recorded using a Policy Analysis Table (PAT), formulated based on the underlying conceptual framework for the study. Summaries of the policy mix for each country were produced to communicate policy targets, objectives, budget, indicators and impact to key stakeholders.

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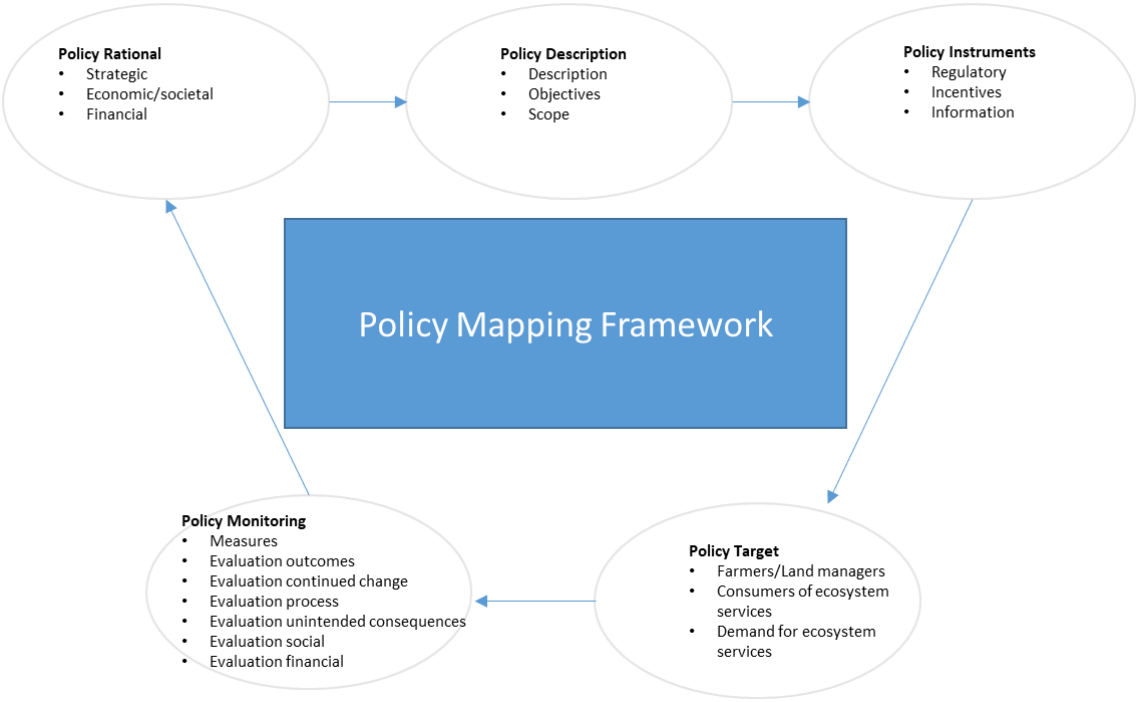
Figure ii. Overview of the policy mapping framework



Stakeholder interviews: In order to validate the policy mapping, and to give a bottom-up analysis of the effectiveness of policies relevant to PG management, at least 10 stakeholders from each case study country were interviewed (50 in total). The 10 qualitative interviews aimed to cover stakeholder representatives that have or ought to have an interest in PG policy. Each country team was required to have at least one representative from government, academia, farmer, and special interest groups. Each interviewee would represent the expert view from their interest group (e.g. Kohler et al., 2017). The interview questions allowed for a comparative understanding of the aspects of effectiveness within the policies studied as well as across the policy mix. Effectiveness was defined within this project using concepts of perceived relevance, democracy, legitimacy, efficiency and impact.

3. *Case studies and results*

Results of the policy mapping and stakeholder interviews are presented in a case study for each country. Each case study reports key features of the national context in relation to socio-economics, governance and PG condition and extent, as well as details about each policy studied and summary of the interviews with stakeholders. Table ii briefly summarises some of the core aspects of each case study and a brief overview of the perceived effectiveness expressed by interviewees.

Table ii. Summary of case studies for each of five BGRs.

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Country (BGR)	Permanent grassland area	Details of grasslands	Governance structure and policy context	Key challenges and threats	Key stakeholder perceptions on effectiveness
Czech Republic (Continental/ Pannonian)	24% of agricultural land use	PGs are distributed predominantly in mountain and sub-mountain areas. In general, the higher altitude the higher share of PG in the total area and used agricultural area. A higher share of PG is also found in lower areas of the north-west Bohemia due to collapse of large-scale faming in these regions after the disruption of state farms.	Czech Republic is centrally governed by the parliament and executive and is split into self-governing regions and municipalities. Breakdown of post-war collectivisation through merging of cooperatives in 1980s led to agriculture being seen as a tool for production. Grassland areas have been decreasing in favour of arable land until the end of the 1980s. The split of Czechoslovakia into two independent states, Czech Republic and Slovakia in 1992 caused changes in land rights, and agricultural policy was weak. Market adjustment and recession led to a drop in production and abandonment of marginal land. Changes since 1989 quite quickly allowed reestablishment of functioning market mechanisms and represented a milestone in the development of the agricultural landscape. 1990s and joining the EU brought new agricultural policies, but with mixed priorities for production and environmental protection.	Loss of agricultural land through suburbanisation, reforestation and land abandonment. Decreasing production through reduction in livestock and drought in the lowlands. Declines in farmland birds and biodiversity due to unfavourable conservation status and condition of protected areas. Soil erosion, nitrate, phosphate and pesticide pollution of surface water, and adaption to changing climate (floods and droughts).	**Relevance:** most respondents considered the identified policy-mix as relevant for PGs, but the significance of individual tools for PG management is very different. **Legitimacy:** most stakeholders recognized that sustainable PG management requires policy to balance production and environmental objectives. **Democracy:** Some of the policies or subsidy distributions are not satisfactory for all stakeholders (conflicts between "small and big" farmers, agricultural and general public interests). **Efficiency:** the majority of respondents perceived low levels of efficiency in the policy mix. Stakeholders indicated that the current policy is costly and that instead of ES maximisation, PG management is driven by subsidy maximisation. **Effectiveness/ Impact:** The majority of respondents assessed the Impact as very low. It is good in terms of PG quantity (maintenance of the share of PG) in the Czech Republic but very low in terms of PG quality and productivity. Stakeholders mentioned the problem of unmeasurable or unmeasured public benefit. Incentives provided by the Ministry of Agriculture and their conditions largely determine farmer's activities.
Spain (Mediterranean)	Natural and semi-natural herbaceous plant communities cover more than 15 million ha, or one third of the national territory.	Spain is a country with a long history of pastoralism and a great livestock tradition. Small areas of grassland are located in the high and medium mountains, but the majority is located in lowland areas, where semi-natural pastures dominate the plains and gently sloping land with a dispersed arboreal (and sometimes bushy) stratum. The most representative agro-ecosystem of pastures in the Iberian Peninsula region (case study region) is the dehesa. The dehesa is a characteristic and practically endemic agroecosystem of the Iberian Peninsula, which occupies approximately 1.3 million hectares in Portugal, where it is called montado, and some 2.4 million hectares in Spain.	Spain has an established system of recognition of territorial autonomy that legally and administratively materializes in a profound decentralization, with 17 Autonomous Communities and 2 cities with statute of autonomy, Ceuta and Melilla. The Autonomous Communities have financial autonomy. Each Autonomous Community has drawn up a RDP that, in addition to the horizontal measures and common elements set out in the National Rural Development Framework, includes specific measures to respond to different regional situations. In the dehesa area, Law 7/2010 recognizes the dehesa as an integral and multifunctional space. In 2017, Decree 172/2017 approved the Master Plan for the Andalusian Dehesas. This Plan is the general planning instrument for the dehesas located in the Autonomous Community of Andalucía.	Marginal and less productive areas are experiencing extensification in land use (Tárrega et al., 2009). The more central and productive areas have been shifting towards more intensive agricultural production and intensification of pastoralism, mainly in response to world food trends (Nonhebel & Kastner, 2011). These changes are reflected in their spatial fragmentation, homogenization, lack of tree regeneration, vulnerability to ecological disturbances, and increased risk of soil degradation (Surová et al., 2017). Drivers of change in the natural capital of Andalucía. These include: i) changes in land use; ii) climate change; iii) pollution; iv) invasive species; iv) alterations in biogeochemical cycles; and v) overexploitation of eco-services and biotic resources (Montes & García, 2012).	**Relevance:** Regarding the first pillar of the CAP, most interviewees (approximately 60% of them) consider that the objectives of this policy do not respond to the problems of PGs; however, the second pillar does (approximately 62%). The main limitation of other policies is that they do not have their own financing instruments. **Legitimacy:** Some groups (agriculture and environmental) believe their ideas and needs are not finally reflected in the design of the CAP I policy; but that the majority are reflected in CAP II and other policies. **Democracy:** Most stakeholders agree that CAP I is a rigid policy that does not allow for major changes. Participation has been mainly through the regulated processes of reviewing documents and sending allegations. Participation in CAP II is higher e.g. through the establishment of ad-hoc partnerships. Participation in Dehesa Master Plan is through meetings and working groups. **Efficiency:** Five of the interviewees considered that the budget of the policies is not adequate; four of them considered that it is, and one did not pronounce on this matter. **Impact:** Most interviewees considered that most of the official indicators focus on issues within the scope of implementation (e.g. number of applications made, area covered by aid, number of indigenous livestock, etc.) but are not sufficient to measure other much more important effects such as biodiversity or an increase in the provision of ES.
Switzerland (Alpine)	11.600 km^2 (i.e. approx. 28%) of the country is PG; 58% of the utilised agricultural area (UAA).	PG areas have increased by 1.7% in Switzerland between 1996 and 2015. This was the net result of a combination of conversions of PGs into other land uses (–0.4%) and an increase because of conversion from other land uses to PG (+2.1%) over the two decades. A large proportion of PGs are used for grazing livestock. The majority of farms (60% in 2013) specialise in grazing livestock (FSO). In 2018, most of the farmland was made up of natural meadows and pastures (607.500 ha, or 58% of UAA).	The Swiss Confederation is a semi-direct democracy (representative democracy with strong instruments of direct democracy). Switzerland is a federal country, which means that power is decentralized and the laws are typically implemented at the cantonal and municipal levels. Accordingly, the subnational bodies play a critical role when it comes to the implementation of policies. In 1996, the Swiss population approved the introduction of a new article in the Federal Constitution (Article 104) that established the principle of multi-functionality of agriculture. In 1993 there was the introduction of direct payments for public services and voluntary ecological programmes, based on a cross-compliance system. The federal authorities promote extensive agriculture and low-intensity grasslands with direct subsidy payments. In 2009, the Swiss Federal Council defined the goal to reduce ammonia emissions by about 40% and nitrogen oxide emissions by	Swiss agriculture is based on the production of milk, meat, eggs and other animal products, which leads to a relatively high livestock density in a small country with an even smaller percentage of non-mountainous land (ca. 30%) where farming is economically feasible. Excessive nitrogen (N) levels are of particular concern in Switzerland. Overgrazing: In the alpine summer grazing area, grazing intensity is one of the most important management variables controlling vegetation and ES. Farmland abandonment in mountain areas: Between 1985 and 2009, the agricultural and alpine agricultural areas shrank by 5.4% (850 km^2).	**Relevance:** overall, the identified policy-mix is relevant for PGs. However, there are several other policies that act in the opposite direction by creating negative impacts and competing pressures on PGs **Legitimacy:** Most stakeholders recognize that in order to promote sustainable PG management, policies should seek to balance production and conservation objectives. Some of the policies are not satisfactory for all stakeholders, because initial policy intentions have been heavily 'diluted' in the consensus building process, and there has been strong lobbying from the agricultural industry. **Democracy:** the intensive consultation process behind law-making in Switzerland ensures a broad level of participation and consensus. However, it also offers unbalanced opportunities for powerful lobbying groups **Efficiency:** there is no clear-cut evidence that the Swiss support for the agriculture sector is efficient. All stakeholders indicated that it is very costly, and that public spending on agriculture is well above EU average.

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Country (BGR)	Permanent grassland area	Details of grasslands	Governance structure and policy context	Key challenges and threats	Key stakeholder perceptions on effectiveness
			about 50% compared to 2005. To counteract biodiversity (particularly, plant diversity) loss, grassland plants for forage production in Switzerland are sown almost exclusively in mixtures. The Swiss organic market is well developed, with the highest per capita consumption of organic products in the world. There is an initiative for clean drinking water and healthy food in Switzerland. This popular initiative launched in 2018 by Greenpeace Switzerland, Birdlife Switzerland, the Swiss Fishing Federation, etc. aims to cut direct subsidies to farmers who use pesticides or antibiotics. Swiss agriculture is comparatively disadvantaged compared to the situation in neighbouring EU countries. The Law on Peasants' Land Rights (LPLR), enacted in 1991 with the aim to protect the structure of Swiss agriculture, introduced a ban on fragmentation of parcels and a preferential price for farmland successions and transfers within the family.	Climate change: Changes in climate are increasing the frequency and persistency of droughts and floods in Switzerland, particularly in the inner Alpine valleys. The number of invasive species is a growing problem (107 invasive plants and animals) and is aided by climate change. Biodiversity loss is also a concern.	**Effectiveness:** the overall impression that emerged from the interviews was that the situation is slightly better in terms of PG extent (quantity), but poor in terms of PG qualitative indicators, such as agricultural intensification (increasing) and biodiversity (decreasing).
Sweden (Boreal)	In 2015, there were 682,000 ha of PG in Sweden, consisting of 303,000 ha of grazing pastures and 379,000 ha of long-term grasslands.	The highest concentration of semi-natural permanent grasslands are found towards the south of the country in the Boreal-Continental region and are predominantly used for cattle and sheep grazing.	Before Sweden became an EU member, Swedish agricultural policy was dominated by central price agreements and border protection (import restrictions and export subsidies). In the price agreements, domestic product prices were negotiated between the industry and the government. The policy supported structural rationalization in the form of concentration of animal husbandry to certain regions and the merging of farms into larger units. With EU membership in 1995, CAP began to apply in Sweden as well and is today the dominant political control of Swedish agriculture. However, there is scope for national governance and legislation both within the CAP and through the national policies of Sweden (KSLAT, 2017).	Rapid and continuous decrease in the quality of remaining semi-natural grasslands, shown via deteriorating conservation status. Abandonment of smaller, remote grasslands due to lack of farmers and capacity to manage large areas. The areas of arable, meadow and pastureland have decreased. Arable land is used more intensively, and the forests have become increasingly more widespread. Fragmentation of the landscape through removal of stone walls and arable islands etc. Declining species richness. Declining milk production and a declining profitability of farms. Lack of livestock and livestock grazing the best land. Problems with support payments including, poor design, great regional differences where southern Sweden was favoured, confusion over changing definition of grassland, low social efficiency of payments, unintended effects on water pollution and emissions. Competing land use patterns, urbanisation and need for energy. Limited data and knowledge about grassland changes and effects. There is a need for better measurement.	**Relevance:** Policies are generally good but need more money and more knowledge transfer, not always good at a farm level. **Democracy:** Stakeholders generally felt that policy makers listened to their ideas and that some groups have influence, e.g. through local policy discussion fora, but some groups want more influence. Stakeholders acknowledged that the Board of Agriculture has power. **Legitimacy:** Most believe the policies to be important. Farmers don't want policies to interfere with profitability. Agriculture and nature often conflict, so farmers need to comply with regulations. Some stakeholders thought that money was distributed unfairly; and that the public should have better knowledge of existing policy. **Efficiency:** Policies should support grassland management and compensate farmers more for retaining PG. Current policies are too centrally controlled and administration is too complex. Policy has resulted in fragmentation of grassland areas. The single farm payment scheme is inefficient, with farms too reliant on payments. **Impact:** Policies mean that farmers can stay in business, but their impact on the environment is not clear. Simplify policy design and increase the amount and flexibility of compensation payments. There is a lack of indicators to show effectiveness.
UK (Atlantic)	Grasslands represent over two thirds of UAA. Grassland areas in 2018 included 1.2 million ha of temporary grassland (<5 years old), 10.2 million ha of PG (>5 years old) and 5.1 million ha of rough grazing (Defra et al., 2019).	Much of the managed grassland is located in the West of the UK, concentrated in Wales, SW England, lowlands in Northern England and central Scotland and the North East lowlands in Scotland. The wetter climate in the wetter western regions makes arable production more challenging than in the drier east. PG can vary from productive grassland for intensive livestock to unimproved species-rich grassland.	Environmental governance in the UK is a devolved issue. This means that the governments in England, Wales, Scotland and Northern Ireland make their own decisions about priorities and strategies for delivery of goals around environment, agriculture, fisheries and energy. Each government has their own department, public bodies, committees and advisory groups responsible for such issues. All UK nations were within the EU and complied with standards and policies that applied to EU nations. However, as part of devolution, Scottish and Welsh governments have sought to create environmental policies that go beyond the EU's minimum requirements (Burns et al., 2018). In England, the launch of the 25 years Environment Plan (Defra, 2018) brought ambitious targets that have supported progress amongst UK government on the creation and production of an Agriculture Bill and	Despite a focus of new legislation on environmental and public goods in agriculture, there is still a recognition of a need to increase production and some pressure to intensify. Grassland areas that are not designated under Sites of Special Scientific Interest (SSSI) legislation, or protected through Natura 2000 or the Habitats Directive, can be easily converted or intensified, often without triggering the Environmental Impact Assessment (EIA) legislation in the UK. This can result in the loss of important habitats and biodiversity, as well as other key ES.	**Relevance:** Polices were seen to be working 'to a certain extent', with some positivity that they help conserve and maintain PG, but some understanding that policy was not fully fulfilling its role, and that difficulties existed in implementation and design. Difficulties with the definition of grassland were important. **Legitimacy:** There was reference to a loss of legitimacy through a loss of trust in the policy system (through uncertainty around Brexit), problems with the length of policies and the ability for changes to become undone, as well as a lack of evidence for when the right actions are undertaken. **Democracy:** At the level of individual organisations, there was a feeling that most have some form of power when it comes to influencing policy or having opportunities to comment and feedback. A certain amount of success was seen to be assigned to endeavours that bring multiple groups together to effect changes.

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Country (BGR)	Permanent grassland area	Details of grasslands	Governance structure and policy context	Key challenges and threats	Key stakeholder perceptions on effectiveness
			an Environment Bill to lay out future plans for agricultural and environmental management policies in the future. These bills are part of a process of policy redesign happening in the UK as a result of the 2016 referendum to leave the European Union. In relation to agricultural policy, for more than four decades the relationship between the UK Government and the farming sector has been dominated by the EU's Common Agricultural Policy (CAP), which has determined the public subsidies paid to farmers (Bateman & Balmford, 2018). This relationship is changing and new policies will emerge in the next few years. However, political uncertainty around the Brexit process has greatly affected design and decision-making processes.	Under-management is a challenge largely due to current agricultural economics and policies, exacerbated by stock regulations and restrictions (JNCC, 2016). Draining, cultivation and fertilising as well as inappropriate cutting/grazing has resulted in an overall loss of grassland biodiversity through loss of species number and abundance (JNCC, 2016). Rewilding may threaten PG if rewilding schemes are not implemented collaboratively with farmers and landowners (Pakeman et al., 2019), and the differentiation between abandonment and rewilding is not clear. In some places fragmentation of grassland areas is extreme, and means that certain habitats occur only in very small, isolated patches. Tree planting policies target PG and may mean that PG area is reduced to meet climate change mitigation targets. The heightened uncertainty around post-Brexit agricultural policy is acting as a threat to the sustainable management of PG.	**Efficiency:** Some interviewees were not able to comment on efficiency, as they did not have the knowledge or awareness of high level costs. Monitoring and evaluation were seen as important aspects of evaluating the efficiency of policies. Stakeholders mentioned inefficiency in relation to administration and delivery. **Impact:** Stakeholders thought that certain policies, such as the CAP rules and the EIA, had a direct impact because "they capture quite a lot of the directive stuff" (NE); and that SSSIs were a strong policy because they "can conserve sites" (NE). Impact was associated with achieving goals and seeing change in environmental indicators. However, some evidence shows that farmers often do nothing differently when being paid through agri-environment schemes.

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4. Key messages and conclusions

The policy environment in Europe is extremely complex, and evaluating a policy mix addressing a specific land use as a whole is difficult. In this review, we found that few policies directly targeted PG, and as such, decisions made about their management are affected by a broad range of other policies affecting agriculture, landscape, environmental change, conservation and production. We have, however identified the central role of EU CAP policies Pillar I and II (and the key agricultural and environmental policy in Switzerland) in shaping the economic, social and environmental context in which PGs are managed. This is supplemented by other policies at the EU level including Habitats Directive, Nitrates Directive and Climate Change policies, which stakeholders in this research identified as the most important EU policy influences on PG management. This was due to their implications for key decision-making about management actions such as nutrient inputs and land use change, as well as the promotion of important ES and environmental protection. Stakeholders identified these policies alongside various national scale policies addressing more specific issues, including planning policies, local management planning, product premiums and quotas, amongst others.

Finding clear and concise policy descriptions at the member state level was challenging. However, in relation to collating detail about the aims, objectives, effects, impacts and evaluations of policies, we conclude that it was nevertheless important to compile this information so that differences in, for instance, policy rationale, measurement, and logic could be distilled and compared. It was beyond the scope of this review to fully compare and analyse all the detail within the collated data, however this type of data opens up opportunities for future researchers to explore details of the policy instruments in each case study country; and also informs future research within the SUPER-*G* project. In particular, the findings can be used to inform and substantiate recommendations regarding possible changes in future policy targets, policy instruments and implementation directions (e.g. Task 4.4 of SUPER-G). Recommendations will contribute, for instance, to the ongoing debate about the priorities of the post-2021 CAP, such as the European Commission consultation on how to introduce measures aiming to promote sustainable development, preservation of natural resources, and rural value chains in areas such as clean energy, bio-economy, circular economy and eco-tourism (Nègre, 2018). Thus, we argue that the greatest contribution in this report is the resulting empirical database and the detailed operationalization of our mapping, which can be built upon in future.

In relation to better understanding policy logics across the case study countries, we found that the mechanism evidenced in policy instruments affecting PG management is remarkably similar across Europe. The most common approach, by far, is the use of regulation and incentives to influence land managers and farmers, who in turn make decisions about landscape management, which affects the structure and composition of the landscape, subsequently affecting its functions and the provision of benefits and values (Van Zanten et al., 2014). Nevertheless, many of the policies targeting PG management justify their existence by claiming benefits towards specific ES. However, our mapping data shows **there is often a gap between**

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policy rationale to improve particular ES (e.g. improved climate regulation through carbon storage, or improved species diversity) and actual measures used to ensure that policy objectives are met. This is not surprising since policy outcomes at the level of actor behaviour, such as changes in landscape management, understood through number of sign-ups to a particular management scheme, tend to be easier to measure than policy impacts like the ES that flow from the landscape (Caviglia-Harris et al., 2003).

Much less common in the policies reviewed were policy logics engaging consumer demand for ES or direct payments for ES (particularly those unrelated to food and energy). One reason we did not find more instances of engaging consumer demand is that we did not include informal policies in our review—some of which include support for engaging consumer demand for ES by NGOs. Equally, ES and PG may not yet be consumer issues. Direct payments for ES may have been underrepresented because of their indirect link to PG and the way in which we instructed expert stakeholders in this review to focus on the *most relevant* policies that intend to promote sustainable PG management. However, these limitations do not explain corroborating statements from our interviewees suggesting the need for more engagement with consumer demand and direct payments for ES. They also do not explain the lack of relevant examples of policies with indirect influences (policies not directly targeting PG land management) given by the stakeholders in this review. Perhaps the general lack of (and lack of prominence of) such policies is because they are often difficult to implement and are seen as indirect (and potentially inefficient in the short term) modes of achieving given policy outcomes. Although we recognise that this review did not include informal and voluntary policies, and therefore more research is needed into the type of consumer focus taken within these, we view that there is potentially a missed policy opportunity to design and implement more consumer-led policy around ES delivery. The increased flexibility that member states will have in the CAP reform 2021 could potentially address this additional policy focus. However, this is unlikely to occur without intervention in the policy development cycle.

Firstly, although by the nature of international policy development, decisions about direction and inclusion of new instruments emerge from powerful committees at the highest level of policy development, the power in determining how the budget is allocated in each country resides with the most powerful groups within each nation. Although in each case in this review, it is the government who allocates budget and designs the focus of the implementation of policy goals, in several of the countries we investigated there appears to be a significant influence of farmer interest organizations in lobbying government agencies. Some government departments are heavily staffed by (former) farmers, although this is not the case in all countries studied. The powerful voice of farmer groups could be associated with the current focus of policy delivery on regulating land management, often with the aid of direct payments for compliance, rather than promoting consumer demand for ES (other than through a small number of voluntary measures and schemes). This may be because some farmer groups are motivated by the economic incentives they can receive for producing goods and managing the land (Elliot et al., 2019), and will therefore lobby heavily for this approach to be favoured in policy delivery. However, focusing on landscape management, whether through direct payments or other mechanisms, may only indirectly ensure that management prescriptions deliver ES. Conversely, focusing on

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increasing demand for ES may better serve societal interest. However, the benefits that farming groups are seeking from the management of PG may be (seen to be) secondary or indirect via such alternative policies. Understandably, therefore, farmer organizations (and possibly government agencies) will prefer direct payments for managing the land, possibly at the expense of the ES delivery that other groups may prioritise.

Secondly, in addition to farmer interest groups, there are many other interested stakeholders representing societal interests ranging from biodiversity to cultural heritage, and climate. Related to the fact that PGs have a wide variety of uses and benefits at multiple scales for multiple groups, policies are not currently integrated in relation to PG management. This means that stakeholder groups may only be brought together around single issues or localities, often without the wider governance structures to integrate more formally around their shared value in PGs. Where stakeholder group agendas do not align, despite their shared environment of the PG landscape, conflicts can also occur, and a disparate mix of groups and messages emerge around policy and best management practices. Much like the farmer organizations who focus their influence on increasing payments for landscape management, these disparate (and often less well resourced) groups promote their own agendas when lobbying government or implementing policy. Although some organisations with similar interests have found modes of interaction to form alliances, shared interest associations and more powerful lobby groups, the values and ideas of other stakeholders cannot be easily reconciled. The net result of this may be that decision-makers embrace the simplest messages and solutions, particularly where they fit current economic and political models and ideals. Often the primary rhetoric denotes that without subsidies for farmers, farms and their social networks and supply chains will disappear along with the grasslands that provide essential ES such as carbon storage, unique biodiversity, landscape aesthetics and associated cultural heritage.

We suggest that unless stakeholders that represent broader societal interests can access the structures, opportunities and resources to work through conflicts, as well as to bridge competing legislatory requirements, policies will continue to reflect the interests of landowners and land managers. Despite some evidence of success and satisfaction with the way in which stakeholder groups become involved in policy design and delivery in our case study countries, some stakeholders recognise that there are limited opportunities to become involved in PG-relevant policy processes. More democratic participation in policy processes may therefore be beneficial to find new ways of delivering PG improvements, and may mean that new instruments and policy logics emerge as favourable and acceptable beyond economic incentives for land management. To influence PG management, we therefore recognise that the type of instrument, the policy logic, policy target and mode of implementation and policy design are highly interrelated, and need to be better coordinated to achieve the multifunctionality required to deliver a range of ES whilst also maintaining productivity and sustainability of the PG areas.

Despite these limitations to current policy processes, in relation to stakeholder interviews, we were surprised by the overall satisfaction of stakeholders with the policy mixes in each country that related to PG management. Interestingly however, the reasons for general satisfaction differed greatly between countries. In Sweden, there appeared to be a high level of trust in

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government and farmer interest organizations. So much so that finding experts on PG policy outside of these previously mentioned groups was challenging. The lack of external experts could be seen as evidence that in Sweden there was little demand from other stakeholder groups to better understand and influence the policy development process. This, however was not the same for all case studies, and may demonstrate that PG plays different roles in the agricultural landscape and agricultural livelihoods of the populations. For example, in Spain the importance of grassland management was seen to have a more direct influence on the survivability of Spanish farms in the dehesa than Swedish farmers in northern Europe, where other forms of land use are often more of a focus.

For policy makers and others who influence the policy process, there are several important lessons, the first of which is the need to aid the management of complexity around PG policy. Numerous policies affect PG management at the international as well as national scale, and the variation in our first round of Delphi policy responses illustrated this. Our stakeholders tended to be experts in one or a few policies, or generalists in many policies; very few had a thorough overview of all policies. Our document search also highlighted the complexity of sources that exist to understand and learn about the policy requirements, monitoring and impacts. Equally, it was mentioned several times in this report that complexity in applying for and complying with agricultural policy has turned many land managers off. More importantly however, we feel that the difficulty in accessing information about policy and, in some countries, a limited understanding of this policy concentrated into too few individuals is a direct threat to the legitimacy of grassland policy. We believe that the complexity associated with the multitude of policies affecting PG management inhibits stakeholders from taking a more active, democratic role in the policy formulation process. Further development of the PATs for each country presented in this report, or a simplified database that provides in simplified language the goals of policy, its rationale, how it is measured, and how certain we are of its outcomes and impacts would be a useful resource for stakeholder groups that represent the public interest. It may play a part in helping to engage more groups in the policy development process, which, if taken alongside reform to the logic and mechanisms used to deliver outcomes, may create more effective policy environments for PG management.

Taken together, we believe that there are some concrete steps that can be taken to improve the PG policy landscape - preferably, before CAP reforms in 2021 become institutionalized.

- Better management of complexity. We learned that complexity is not just about compliance, it is also about understanding the system of policies in place and making them accessible to stakeholders who (ought to) have an interest in or influence on policy development.

  a. Develop a database on grassland policy that is sortable and easy to access information.

  b. Develop decision support tools (DSTs) that inform stakeholders in language they understand what policies are in place and how they relate to ES/PG management.

  c. Introduce integrated ES assessment and monitoring systems (via DSTs) to improve the calibration of policy instruments towards the achievement of their stated goals and

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objectives, the minimization of unintended effects and trade-offs, and the monitoring of results and impacts by all stakeholders concerned.

d. Develop standardized goals for PG management that are connected to the Sustainable Development Goals (SDGs) and ensure that measures are standardized and SMART.

- Require stakeholder assessments to accompany strategic plans. In future, member states will have more autonomy in determining how and why CAP money is spent. Ensuring that key stakeholders are aware of, understand, and are included in drafting strategic plans should improve democracy, legitimacy, and overall policy effectiveness.

- Encourage an understanding of trade-offs between PG and ES. European policies that influence grasslands are either focused on landscape structure *or* ES. Those focusing on structure aim to influence (loosely defined) ES indirectly. Those focused on ES indirectly influence landscapes. Policies that explicitly target the interaction between landscape structures and ES (or target them in parallel) may be more efficient in achieving their goals.

- Encourage a balance of policy logic. This entails moving away from targeting farmers with regulation or subsidies to manage the landscape towards targeting consumer demand for ES (through information, standard setting, etc.) and the value of ecosystem service (such as direct payments for regulating and cultural services). While informational tools (such as product labelling) are being used to address consumer demand (although were not part of this analysis), these are informal policies. We encourage governments to take a stronger role with these softer tools.

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1. INTRODUCTION

Permanent grassland (PG) is a significant feature of agricultural land across Europe. Eurostat data for 2013 showed that PG[2] covers almost 60 million hectares across the 28 EU Member States, and accounts for 34% of the total Utilised Agricultural Area (UAA). PG is often grazed by livestock and therefore supports dairy and beef/sheep agriculture; it can also be cut and used for hay, silage or renewable energy production. PG also offers an alternative land use where other forms of production, such as crop growth, are unviable. Policies designed to support farming within particular regions have considerable direct and indirect impacts on the opportunity, viability and scope of maintaining and managing PG in agriculture, and therefore on the benefits and impacts of PG land use.

There are many policies that directly or indirectly influence the legal, economic and social context in which PG management decisions are made by farmers, land managers, landowners and other stakeholders. Decision-making stakeholders have impacts on PG not only in relation to management activities (e.g. cutting regimes, stocking densities, seed mixes, land access, cultivation frequency), but also in relation to their decisions to convert or even abandon grasslands. In developed agricultural systems, an increasingly common policy approach is the provision of agricultural subsidies for goods and services beyond the production of marketable food and fibre (Mattison and Norris, 2005). This is often complemented by the existence of environmental policies that aim to protect environments, species and habitats, balancing production with conservation. This 'multifunctional' approach aims to improve sustainability.

The existence and sustainable management of PGs is key to ensure the delivery of many Ecosystem Services (ES) and benefits that are increasingly recognised and valued, including water quality and quantity regulation, soil protection, carbon storage, nutrient cycling, food production, spiritual and cultural value, and recreational spaces. Safeguarding PGs is important because their disappearance or unsustainable management would lead to losses of many of these services and benefits (Layke et al., 2012; Kroeger & Casey, 2007). These can be understood

[2] "Permanent grassland and meadow is land used permanently (for several — usually more than five — consecutive years) to grow herbaceous forage crops, through cultivation (sown) or naturally (self-seeded); it is not, therefore, included in the crop rotation scheme on the agricultural holding. Permanent grassland and meadow can be either used for grazing by livestock, or mowed for hay or silage (stocking in a silo)" (Eurostat, 2018:192).

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as 'input ES' that increase biodiversity, improve water quality and soil conditions; 'marketed services' that influence forage output, and 'non-marketed services' valued for their social, recreational and spiritual functions (Lamarque et al., 2011). However, demand for ES varies across, and even within, sectors, societies and biogeographical regions resulting in conflicts of interest among stakeholders that drive sub-optimal ES management decisions and contribute to a decline in PG quality and extent (Cord et al., 2017; Lee & Lautenbach, 2016; Martín-López, et al., 2014).

To balance the needs of society with those of farmers, agricultural supply chain businesses, conservation organisations and other interested stakeholders, governments at different levels (i.e. international, national, and local) use policy instruments such as regulations, economic measures and information (Bemelmans-Videc et al., 2011) to regulate, incentivise and encourage behaviour that promote sustainable PG management practices. These policies are often designed in line with inter-*G*overnmental, national and regional political, economic and social priorities, and their success (and the way success is perceived and measured) is affected by their context, including the governance structure, networks of actors and the power dynamics of political and economic institutions.

The Common Agricultural Policy (CAP) of the European Union (EU) is one of the largest agricultural policies in the world, and is the longest established in Europe. The origins of the CAP are set in a productivist paradigm, promoting growth in food productivity based on price guarantee mechanisms (Silvis and Lapperre 2010), it has since evolved through market liberalisation by compensating farmers through direct payments (Huige, Lapperre, and Stanton 2010), towards favouring more sustainable agriculture (Potter and Tilzey 2005), and adopting instruments that also focus on rural development (Van der Ploeg et al. 2000). When evaluated in terms of policy goals, implementation costs and impacts, the CAP, has been criticized for having marginal climate or environmental impacts (Anania et al., 2015; Cortignani & Dono, 2015; Gocht et al., 2017), as well as questionable cost—benefits (Jereb et al., 2017; Pe'er et al., 2017; Solazzo, et al. 2015). Concerns have also been raised by those who believe priority setting is often skewed by influential stakeholders or governments who sympathize more with profits or political expediency than the environment or climate (Birdlife International, 2018; Matthews, 2018a, 2018b; Robinjns, 2018). Moreover, policy often leads to controversial or unintended consequences (e.g. increased agricultural fertilizer usage, lowered employment) and therefore targeted measures need to be implemented to fit local conditions and priorities of member

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States (Cortignani & Dono, 2019). Research shows that CAP policy schemes prioritized within the EU vary considerably (Kleijn & Sutherland, 2003) as does their effectiveness in facilitating a balance of ES (Tscharntke, et al., 2005).

Consequently, we can learn much from differences across the EU and Europe through a deeper understanding of the policy logics in place and their outcomes and impacts on PG management and ES. It is through this evidence base that we are able to reflect on past successes and failures with the aim of improving policy (Erjavec, 2018).

The **purpose of this report** is to 1) identify and 2) map (describe) the most relevant policies that impact PG management across five European biogeographic regions (Atlantic, Continental/ Pannonian, Alpine, Boreal and Mediterranean), as well as 3) understand their policy logic, and 4) evaluate their *effectiveness* in order to 5), provide an empirical assessment and recommendations for further research that will lead to policy improvements.

In order to achieve the first aim (to identify policies), the policies deemed most relevant for PG management and change across five European countries, representing each of the five biogeographic zones (four within the EU: Czech Republic (Continental), Spain (Mediterranean), Sweden (Boreal), and the UK (Atlantic), and one outside of the EU, in order to provide an alternative European context: Switzerland (Alpine)) were selected by a panel of expert stakeholders using surveys and a Delphi method.

In relation to the second aim (to map relevant policies) 9 EU and 15 regional scale policies were included in a mapping process. Table 1 presents the resultant policies.

Table 1. Policies examined in each of the five European countries.

Policy Examined	Investigated in
EU CAP Pillar I - Basic payments	SE, CZ, UK, ES
EU CAP Pillar I - Greening	SE, CZ, UK, ES
EU CAP Pillar I - Additional payments	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Productivity	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Environmental	SE, CZ, UK, ES
EU Rural Development Programme (RDP) - CAP Pillar II - Rural	SE, CZ, UK, ES
EU Nitrates Directive	SE, CZ, UK, ES
EU Habitats Directive	SE, CZ, UK, ES
EU Climate Change Adaption Strategy	SE, CZ, UK, ES
Planning policy (Environmental Impact Assessment)	UK
Renewable energy/ forestry policy	UK
Agricultural subsidies for farmers in northern Sweden	SE

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The Swedish Board of Agriculture's description of regulation, regarding the consideration of natural- and cultural values in agriculture.	SE
Cattle grazing and outdoor living	SE
Nature reserve (in addition to those in Natura 2000)	SE
The Environmental Code's rules of consideration	SE
Master Plan for the Andalusian Dehesas	ES
Direct Payments for Agriculture	CH
Spatial Planning Act	CH
Federal Act on the Protection of Nature and Cultural Heritage	CH
Federal Act on Forest	CH
Federal Act on the Reduction of CO2 Emissions	CH
Market Support for Agriculture	CH

In relation to the third aim (to understand policy logic), and to fulfil the second aim, the mapping of these policies included a comprehensive description of each policy's logic, including rationale, goals, and impact assessments (HM Treasury, 2018). Also described were the policy instruments used to influence changes in behaviour (Bemelmans-Videc et al., 2011), and the groups targeted by these instruments such as farmers, land managers, and consumers of ES, which includes the general public and other special interests (Van Zanten et al., 2014).

In relation to the fourth aim (to assess policy effectiveness), policy effectiveness was evaluated through interviews with key stakeholders (Reed et al., 2009) in each country, including representatives of farmer groups, academia, NGOs and government (N=50). The variety of groups were chosen to represent the diversity of perspectives (Lugnot and Martin, 2013). Effectiveness can be understood as a function of whether policy goals have been realised. Within this study there was also an exploration of the positive and negative side effects of policy. Stakeholder perceptions of relevance (coherence between problem and policy objectives) were also explored, as well as efficiency (e.g. cost-benefit), democracy (whether policy is influenced by or meets needs of stakeholders), legitimacy (whether there is support from stakeholders for the policy) and impact.

The results of this study can be used in three ways. Firstly, they provide an evidence base to compare and contrast policy differences across, and within, European countries and stakeholder groups. Secondly, they may be used as a reference base for stakeholder groups and policy makers, in relation to the current policy landscape. Thirdly, they can be used to develop insights into ways of improving PG management policy.

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The report contains four further chapters (plus references and appendices): Chapter 2 lays out the conceptual framing for the study, including the theoretical ideas underpinning the analysis of policy logic and effectiveness. Chapter 3 details the methods used, including the application of a Delphi survey to identify the most relevant policies, the use of a policy mapping protocol, and details of the interviews conducted with policy stakeholders. Chapter 4 includes details of the results of the mapping and interviews: it includes the results of the Delphi survey and thus the most relevant policies for PG management across Europe, as well as detailed case studies from each of the five countries. The case studies provide descriptions of the context of each country, the results of the policy mapping, the logic of the policy instruments and the perceptions of the interviewed stakeholders in relation to policy effectiveness. The last section of Chapter 4 offers comparisons of policy logics and perceptions of interviewees across case study countries. Finally, Chapter 5 summarizes the key findings in this report, discusses limitations, and offers policy recommendations.

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2. CONCEPTUAL FRAMING

This chapter provides the conceptual framework used to determine the aspects of policy to be mapped, how an understanding of "policy logic" was developed, and the approach taken in evaluating policy effectiveness. Operational decisions, such as how policies were identified and chosen, as well as coding, are developed in the methods chapter.

2.1 Conceptual Approach: Mapping

The policy mapping in this study needed to serve three primary functions. First, a descriptive overview covering the 24 European and regional policies included in this study was required to compare, contrast, and synthesize results across, and within, member states. This included mapping at the level of policy instruments so that findings could be analysed on a micro level, or aggregated to the macro level as needed. Second, we aimed to understand policy logics in terms of how PG policy interacted with ES. Consequently, the mapping was designed to capture the mechanisms behind PG policy that potentially influenced ES (see 2.1.2). Third, the mapping needed to provide an empirical basis and summary for key stakeholders to evaluate in terms of efficiency (more on this in 2.1.3). Creating an accessible summary of each policy and policy mix was a prerequisite for some key stakeholders to be able to form perceptions about and evaluate policy effectiveness.

Policy research is often divided between the process of policy (e.g. how it is designed and implemented) and the product of policy (i.e. the output, outcome and impacts) (Bemelmans-Videc et al., (2011:6). Our study focused on the latter, even if some elements of the former were included in our mapping tool. As such, the mapping tool we created allowed us to captured elements such as a description of each policy or policy instrument (description, objectives, and scope); the type of policy instruments used (regulatory, incentives, information); the target of policy (farmers, land managers, consumers of ES); policy rationale (strategic, economic/societal and financial); demand for ES; and how policy is monitored (measures, outcome, continued change, process, unintended consequences, environmental, social and financial evaluations). See 3.3.3.

Government sources were used as the main source of information for the policy mapping, and were used when mapping each of the 24 European and member state/local policies. This source was chosen as governments are the creators, owners and managers of policies at the national

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scale and responsible for transforming and implementing international policy. They represent the most powerful actors in relation to policies and have the ability to change processes and practices of policy design and implementation. They are also likely to consistently produce documents, guidance and evaluations of each of the relevant policies over and above grey literature sources, which may be less consistent in their ability and mandate to produce detailed guides or evaluations. The government perspective generated an official view of e.g. the objectives, measures, and impacts of policy, which provided consistent detail but is influenced by the agendas and power dynamics of the governments in relation to the content of the documents. However, with a clear and sole reliance on government sources, the comparability of the results across Europe was increased, and it also limited subjectivity in choosing e.g. the most credible source to represent policy products for each policy instrument. A further advantage of using only government sources to map policy was that, during key stakeholder interviews, if interviewees were directed towards the information gathered in the mapping of relevant policies in this study, it was clear where the narrative (on e.g. policy impacts) came from. This gave each stakeholder group within countries a common narrative to evaluate, and from that, researchers could form perceptions of policy effectiveness.

2.1.1 Level of analysis: policy instruments

The dimensions that can be analysed in a policy effectiveness study are:

- policy outputs, which are defined as end products of the political-administrative process and state action (e.g. the decision to use direct payments in agricultural policy);
- policy outcomes, which are defined as change in actors' behaviour (e.g. decisions by farmers to comply with certain eligibility criteria in order to access compensations or payments for ES);
- policy impacts, which are defined as social, physical or material consequences of the action (e.g. the function of the landscape) (Sager & Rüefli, 2005; Scharpf, 1999).

In the research presented here, the focus is on the policy *impacts*. However, elements of policy *outcome* emerged during stakeholder interviews, and at times overlapped with governmental *impact* reports. Moreover, in the initial mapping step, which draws on policy documents and existing studies, the focus was at the level of policy outputs, hence policy instruments.

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Conversely, in the stakeholder interviews, we were able to address all three levels and hence could focus on the policy as a whole.

There is a vast literature on policy instruments with different typologies. A seminal categorization is "sticks", "carrots", or "sermons" – i.e. regulatory instruments, economic incentive instruments, and information instruments (see Bemelmans-Videc, 2011):

- *Regulatory instruments* (i.e. 'sticks'), often referred to as traditional "command and control" mechanisms, involve high intervention, as they entail stringent guidelines and legally binding requirements for target groups, defined by the government. These are typically coupled with control mechanisms and sanctions (Metz & Ingold, 2014). Such instruments restrict societal action either in terms of time and/or place (Sterner, 2003). Sticks aim to change actors' behaviour so that they either reduce or end activities that have a negative effect on the environment. Hence, such instruments involve mandates and bans. Additional key aspects of regulatory instruments are the setting of standards and planning to enable environmental protection (Jänicke et al., 2003). A final category of regulatory instruments are licenses and permits to, for example, operate certain technology such as a wastewater treatment plants, and to release a certain amount of treated wastewater into a certain water body (i.e. a discharge consent).

- *Incentive instruments* (i.e. 'carrots'), which can also involve a disincentive, occur through a change in price or quantity allowances (Metz & Ingold, 2014). In contrast to regulatory instruments, which involve state intervention, the target groups are free to react (or not) to the incentives (Schubert & Bandelow, 2009). If an actor decides to react to such an instrument, then typically a contractual agreement is made, with rights and obligations that are similar to regulatory instruments. Hence, carrots and sticks both rest on judicial means (Sterner, 2003). Indeed, contracts play a key role in this type of instrument, especially for the creation of a market, where property and use rights need to be defined (Ibid). Three types of carrots are differentiated in the literature (Howlett, 2019; Jordan et al., 2007):

  - Public revenue, like eco-taxes, fees and interests;
  - Public expenses such as subsidies and loans; and
  - Creation of markets through tradeable permits, licenses and emission rights

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- *Informational instruments* (i.e. 'sermons') entail government intervention through a transfer of knowledge between actors. These can be seen as investments in human capital (Green et al., 2012) and are dependent on the extent to which the target group perceives the "relevance, evidence or urgency of the communicated information" (Metz & Ingold, 2014). Through such instruments, the target group is encouraged to, for example, adopt environmental friendly behaviour. Sermons involve information, knowledge-exchange and consultation. The expectation of the government is that through information better solutions can be attained than through legal mandates (Schubert & Bandelow, 2009). Informational instruments are often the predecessors or supporters of other "harder" instruments. They help to structure public debate and opinion development, because the information and knowledge exchange is often the basis for decision-processes (Aden, 2012). A key instrument here is labelling where standardized information about companies is transferred to society (Sterner, 2003). The underlying logic is the assumption that self-accountable and environmental friendly behaviour is only possible if the citizens are informed. The literature further differentiates between the following types of persuasive instruments: (1) government appeals to change behaviour, (2) information campaigns and research, (3) judicial investigations and executive committees, (4) national statistic agencies that gather data on social, economic and environmental activities and (5) surveys of public opinions and general knowledge of current social, economic and environmental topics (Howlett, 2011).

Each of these categorisations were considered when assessing the relevant policies in the mapping stage of this research with the aim to identify the main modes of policy instrument used in policies relevant to PG management and change.

2.1.2 Analysis of the logic of intervention

When considering the assessment of policy logic the empirical links between agriculture and landscape management are important considerations. A Cascade Framework (Figure 1) (Haines-Young & Potschin, 2010 and Van Zanten et al. 2014) enables the conceptualisation of the connection between the policy instruments and related actors (bottom, blue field of (Figure 1), with the 'delivery channels' through which policy measures are deployed. These may generate outcomes and impacts on the structure, composition and flow of ES and/or on the behaviour of target groups. Hence enabling a policy logic of intervention.

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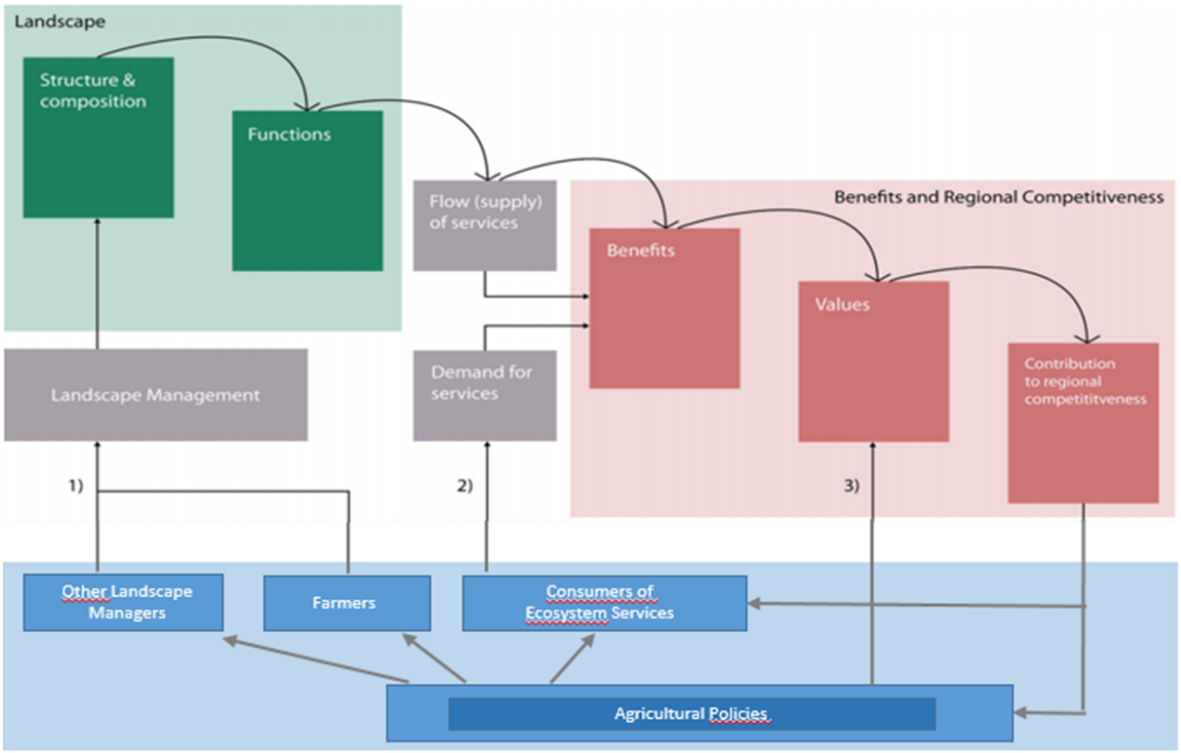
Figure 1. Cascade analytical framework addressing the relationship between agricultural landscape structure and composition, the supply and demand of ES and the contribution of these services to regional competitiveness.

"The mechanisms box describes the actors and policies that impact on agricultural landscapes and the ES *they provide. Farmers and other land managers affect landscape structure and composition through landscape management (1); consumers of different* ES *generate a demand for services and, therefore, create benefits (2) and ecosystem service benefits are influenced by policy and planning through, e.g., payments for* ES *(3)."*



Source: adapted from Haines-Young & Potschin, 2010 and Van Zanten et al. 2014, p 313.

The Cascade Framework facilitates the identification and illustration of typical pathways and gaps in the logic of intervention and has been used as a key reference within this research for comparison between types of policies.

2.1.3 Analysis of policy effectiveness

In a narrow sense, policy effectiveness can be defined as the "use of particular policy instruments in such a way as to increase the chance to achieve the defined policy target" (Heritier, 2003, p. 113). Policy effectiveness should ultimately improve the "state of the underlying problem" (Raustiala & Slaughter, 2002, p. 539). However, what constitutes a policy problem often differs between the goal orientations of diverse actors with varying interests (Schedler & Proeller, 2003). Accordingly, two aspects play a critical role when considering policy effectiveness: On the one hand, issues of *democracy* in terms of meeting the needs of

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stakeholders arise. That is, how is policy perceived in terms of representativeness? Are the policies reflecting all stakeholder interests in a balanced way? On the other hand, *relevance* in terms of the coherence between problem and policy objectives is central. Here the following questions come up: is the policy fit for purpose (i.e. in terms of problem solving, or whether there is coherence between problem/issue and policy objectives)?

Taken more broadly, policy effectiveness is reflected in stakeholders' consideration of acceptability, given that the implementation of public policies inherently involves a degree of state intervention and power (Knill & Tosun 2012). There is a lively scholarly debate regarding "what matters" for acceptance. On the one hand, some scholars argue that what matters is *efficiency*, that is, the ability to deliver the expected result at a minimum cost, therefore avoiding 'waste' or negative consequences is critical (Osborne & Gaebler, 1992). On the other hand, scholars have set out that *legitimacy*, in terms of the acceptance by concerned stakeholders, matters (Newig & Fritsch, 2009). That is, how is a policy viewed in terms of rule of law? Is there support for the policy by different stakeholders such as farm advisors, farmers, and NGOs?

We take a holistic approach by capturing the dimensions efficiency, democracy, legitimacy, relevance and impact, in order to better understand effectiveness. We consider potential moderating effects stemming from differences in stakeholder perceptions (see Figure 2), which can be considered as a bottom-up understanding of effectiveness. That is, the respective "weights" of each dimension on policy effectiveness depends on the stakeholder. We also recognise the top-down influence of the policy/ instrument design and targets.

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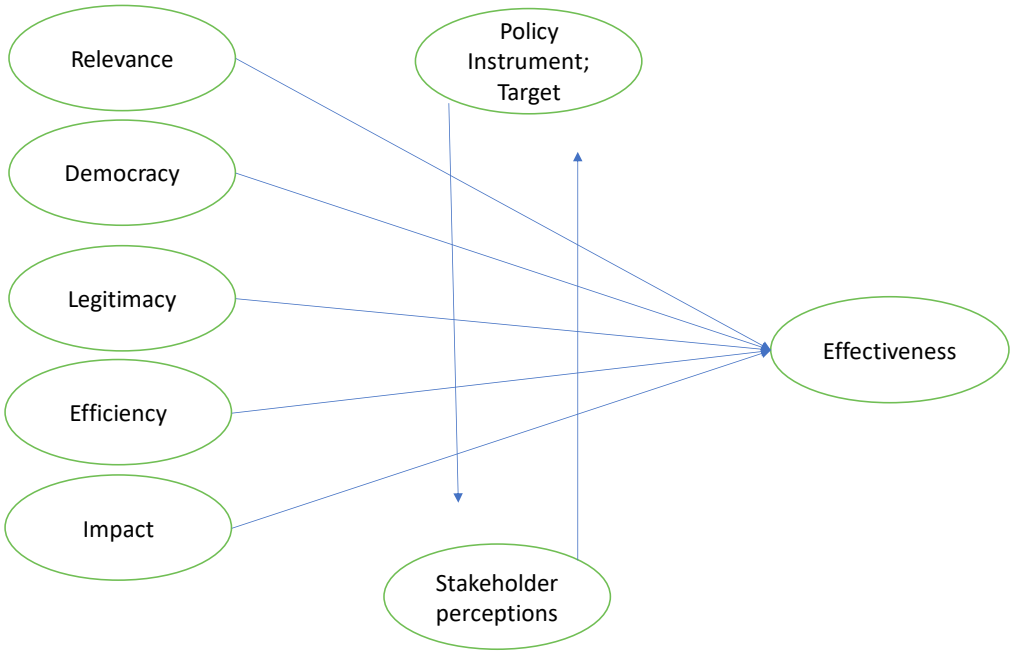
Figure 2. Proxy variables of policy effectiveness.



Source: own representation.

It should be noted that the importance of evaluating the effectiveness of conservation measures has received increasing recognition in recent years, as policy-makers seek evidence of successful returns on investment (Ferraro & Pattanayak, 2006; Kapos et al., 2008; Shwiff et al., 2013). For many conservation projects, although outcomes can be quantified, they cannot be expressed in monetary terms, or monetary terms alone. In these circumstances, cost-effectiveness analysis can be used to assess the change in units of conservation output relative to the cost invested in an intervention to produce these outputs. Financial efficiency can be expressed in terms of cost per unit of conservation effectiveness, with programmes with a low cost per unit of conservation output having a high efficiency (Cullen et al., 2001, 2005; Laycock et al., 2009, 2011). Since a comprehensive cost-benefit/effectiveness analysis was outside the scope of the study, and in line with Figure 3 a combination of secondary, 'top-down' and subjective, 'bottom-up' data were used.

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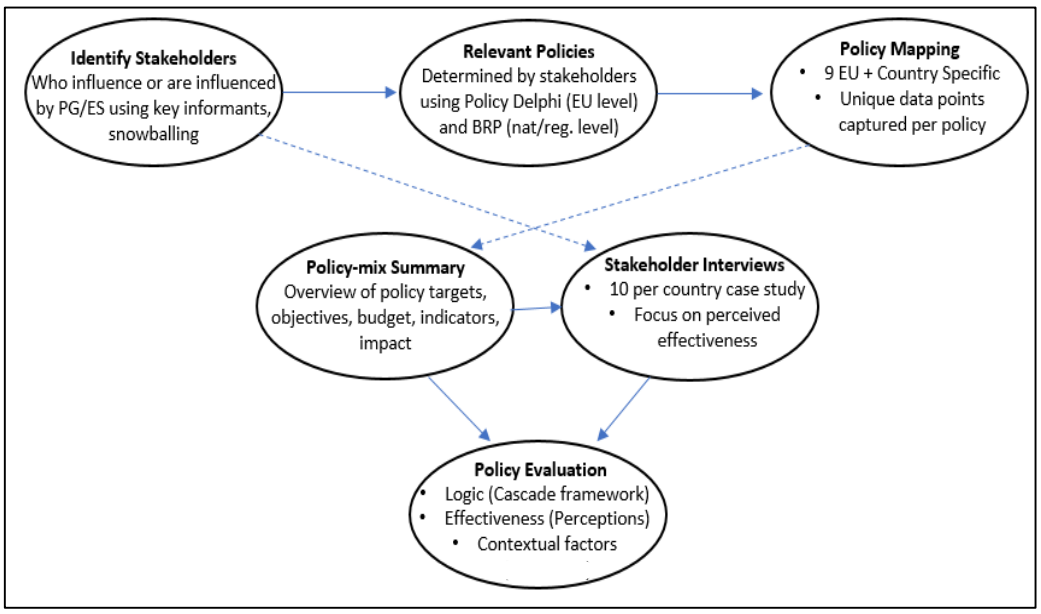
3. METHODS

This chapter outlines the methods and approaches taken to mapping and analysing the policies relevant to PG management. Figure 3 outlines the overall methodological flow, including identifying stakeholders, identifying relevant policies, collecting information about the policies, stakeholder interviews and policy analysis. In sum, the approach, combining a bottom-up analysis of stakeholders' perceptions about the performance of PG policies/instruments across the effectiveness dimensions listed in Figure 33 (i.e. relevance, efficiency, democracy, legitimacy), complements the top-down analysis, which included impact claims issued by policy-making authorities, as well as findings of independent policy evaluations.

Figure 3. Overall methodological flowchart.



Source: own representation.

3.1 Empirical setting

The review was conducted between August 2018 and August 2019, under the coordination of SLU (Swedish University of Agricultural Sciences), and overall guidance from UNEW (University of Newcastle). Country studies were conducted under the coordination of the respective leads (see below). The Review focussed on the following case study countries representative of the five SUPER-*G* biogeographic regions, as follows (see Figure 4):

- Alpine region: Switzerland. Lead: ETH Zurich, Switzerland (ETH).
- Atlantic region: UK. Lead: University of Newcastle, UK (UNEW).

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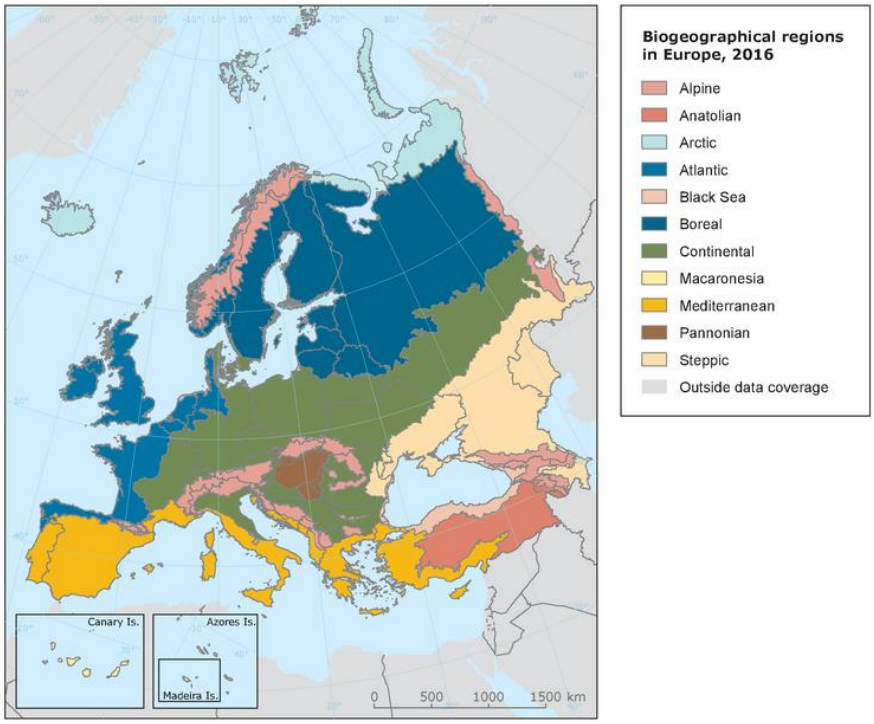
- Boreal region: Sweden. Lead: Swedish University of Agricultural Sciences, Sweden (SLU).
- Continental / Pannonian region: Czech Republic. Lead: Mendel University, Brno, Czech Republic (MENDU).
- Mediterranean region: Spain. Lead: University of Córdoba, Spain (UCO).

Figure 4. Biogeographical regions in Europe.



Source: European Environmental Agency, 2016.

The review covered policies published in the local languages of each case study country. With the exception of Switzerland, which is not an EU Member State, relevant policies in the case study countries included a combination of policies issued by EU institutions and policies issued by national and/or sub-national governments. For further descriptions of these case study countries, including the extent of PG, and the governance context, see section 4.2.

3.2 Policy analysis

The policy landscape is complex in relation to PG. This is because there are very few policies that directly target PG. Those policies that affect the management decisions made about policies are often part of wider policies with varied aims and objectives. Relevant policies were identified from a combination of literature review and feedback collected from policy experts using a

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Delphi research method. To summarize, for the purpose of this report, relevant policies for 4.1.c are those that:

- Have a direct or indirect impact on PGs, i.e. that "target" PG inputs (e.g. what fertilizers are used), production processes (e.g. till *versus* no till) and outputs (e.g. various ES) (Lamarque et al., 2011).

- Have been adopted by a government body, be it at supranational (i.e. EU), national or sub-national (e.g. Cantonal, county or regional) level.

- Are identified as such by policy experts approached via the SUPER-*G* project.

The focus of the review was on the results or effects of policy, in terms of outcomes or impacts, rather than the socio-political decision-making process leading to the adoption of those policies (i.e. how it was designed and implemented). Specifically, for the purpose of the review, policy effectiveness was defined as the extent to which the goals of policy are realized (including positive effects, and negative side effects). The expected result of the mapping exercise is a relevant set of policies that impact most EU member states in relation to PG management, and a list of policies unique to case study countries (e.g. Chevalier & Buckles, 2018).

3.3 Policy mapping

The objective of the policy mapping was to identify policies relevant to PG for inclusion in the analysis. In addition to the Common Agricultural Policy (CAP), which was a specific focus of the review as per the overall SUPER-*G* project design, a number of other policies outside the CAP were to be identified. This identification was achieved through a literature search and the application of the Delphi survey technique to understand the opinions of an expert panel.

3.3.1 Identifying policies relevant for PG management using the Delphi technique

In order to decipher the most relevant policies in the context of the case studies for this task, the knowledge and expertise of stakeholders were utilised. To do this, a dual-round questionnaire technique was applied to gather the opinions of relevant stakeholders about the most relevant PG policies.

Two separate Delphi surveys were conducted with expert stakeholders to identify EU-level policies and national/sub-national level policies. The EU-level survey consisted of two consecutive rounds of consultations that allowed, first, the identification a long list of potentially

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'eligible' policies, and then rank and shortlist those that were considered most relevant by the stakeholders themselves.

The Delphi technique is used to explore group attitudes and needs, set goals, problem solve, forecast, develop policies, and gather information and opinions, particularly where data or evidence to support decision making are not available (Linstone & Turoff, 1975). Since its application to technical forecasting in the 1950s (Dalkey & Helmer 1963), it has been widely applied across disciplines and aims to obtain the most reliable consensus of a group of experts. Through multiple rounds of questions to individual experts, with controlled feedback between rounds, it is designed to produce a 'truer' representation of group position than if groups were to meet face to face, or if individuals were asked in isolation (Dalkey & Helmer 1963). The anonymity of the process, due to the individual response of the participants, often given remotely via email, means that the effect of dominant individuals is reduced (Dalkey, 1972; Oh, 1974, Adams, 2001). The distributive nature of the method allows stakeholders from across geographies and linguistic divides to be included. Moreover, Delphi allows for interaction and feedback across those divides, which is useful in contexts where stakeholders are not able to meet.

Limitations of the Delphi approach have been widely recognised and include aspects such as potential for inconsistent execution, crudely designed questionnaires, poor choice of panellists, unreliable result analysis, limited value of feedback and consensus, and instability of responses among consecutive Delphi rounds (Gupta & Clarke, 1996;Geist, 2010). Difficulties can also arise in relation to the time commitment needed to participate in multiple rounds, which also relates to fatigue of participants. The disconnectedness of internet-based Delphi surveys also mean that there can be misinterpretation of the questions. Such limitations are not always unique to Delphi methodology and can be overcome by maintaining an open communication with participants, setting firm deadlines and informing participants of the process and goals at the outset (Donohoe et al., 2012). In this study the first round of the Delphi was conducted face to face with stakeholders, therefore there were chances to explain and confirm purpose and process, which individuals then could pass on to other participants that they themselves may recruit through snowballing. Other specific limitations relating to this Delphi are described below. Despite these limitations, the ability to mitigate some difficulties and the opportunity to acknowledge limitations and supplement with other explorations via other methods in the rest

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of the review process, alongside the benefits of the Delphi method, make it an advantageous choice for gathering expert opinion on relevant policies for PG.

The Delphi technique seeks to recognise and value the articulation of varying and contrasting visions. It is widely applied (Kezar & Maxey, 2016; Schmidt, 1997; Steinert, 2009; de Loë, Melnychuk, et al., 2016; Paré et al., 2013) and used as a tool to support the solution of complex policy matters (Turoff, 1970). Kezar and Maxey (2016), emphasise that the Delphi technique is particularly well suited to complex problems that require the input and interpretation of multiple stakeholder groups. This is relevant for the task to identify relevant policies for PG management due to the complexity of the policy landscape and the wide variety of stakeholder who are affected by, and can affect the decisions about, PG. The Delphi technique was used in order to balance the views of multiple stakeholders and to come to consensus on the most relevant policies.

In this research, a "classical Delphi" application was used (see e.g. Hasson & Keeney 2011; Rowe & Wright, 1999; Hanafin, 2004; De Villiers et al., 2005 for other approaches). This technique aims to receive a reliable consensus of a group of experts in a series of questionnaires interspersed with controlled feedbacks (Dalkey & Helmer, 1963). The first round is usually unstructured, with subsequent rounds putting forward a more structured, quantitative questionnaire (Martino, 1983). Elements of ranking Delphi, were used to shape consensus about the relative importance of an issue (Schmidt, 1997; Okoli & Pawlowski 2004; Paré et al. 2013). Participants were not required to directly rank policies with respect to their (perceived) important, but rather assess their individual importance (which would allow several policies to be ranked as being equally important). The outcome of the Delphi was to produce a ranking based on those assessments. Therefore, the key purpose of the survey was to elicit a list of policies important for PG management and change. The stakeholders were asked to focus on policies derived at the EU level (or equivalent). This allowed comparisons to be made across countries. The stages of the Delphi process are described in Table 2.

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Table 2. Descriptions of stages of the Delphi process applied to the study.

Delphi stage	Description
Defining experts	The Delphi process normally utilises 'experts' ('a panel of informed individuals' (McKenna, 1994) to answer the survey questions and focuses on their expert knowledge as valuable. The SUPER-*G* network was first used to contact experts, and included partner researchers and participants of related events. The stakeholders approached through this method were self-selected experts who had a decisive interest in the topic of grassland management; they were either employed to work on such issues (e.g. researchers or policy makers), or their lifestyle and vocation involved an interest in the issues (e.g. farmers or representative of farmer groups). A paper version of the survey was distributed to the participants of a SUPER-*G* stakeholder seminar held in Belfast 12-13th December 2018. The survey was also sent in electronic form to those on the attendee list of the stakeholder seminar. This allowed the participants to send on the survey to colleagues if they believed they would be able to contribute.
First round questions	The survey consisted of an open-ended question to stakeholders asking them to identify and describe up to six (or more, if required) policies that they knew about that influenced PG. This incorporated policies that were seen as important for PG management and PG change. Participants were asked to name the policy, the scale of the policy (EU or national), the way in which it influences PG and why it is important (see Appendix A).
Collating and analysing answers	Once the surveys were returned the policies were recorded and compared. Each policy described was sorted into a theme, and the number of times the individual policies were mentioned in the survey was recorded. This gave an indication of the most common policies and policy themes mentioned by the group of experts.
Second round questions	The second round of questions aimed to help understand the relevance of the policies described in the first round. A list of most commonly mentioned policies was collated. This list included directly and indirectly relevant policies for PG management and change (with 'indirectly relevant' referring to policy that impacts on all grassland or, at the farm level, or another land use (e.g. urban), or a policy that is focused on arable land, but indirectly impacts on how PG is managed. Directly relevant policies refer to aspects of decision-making about PG management practices, as well as decisions to convert or abandon). The list was supplemented

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	by two indirectly relevant policies not mentioned in the first round but thought to be worth consideration based on desk research. After the second round was distributed via email to the participants of the first questionnaire (eight weeks after the first round) alongside any other relevant stakeholders identified by the research team. The aim was for participants to assign a level of relevance to each policy based on their influence on PG management and PG change. A five point Likert scale was used ranging from 'not at all relevant' to 'very relevant' with the option for 'don't know or unsure' (see Appendix B), thus giving each policy a score from 0-5 (5 being the highest relevance). The stakeholders were given the opportunity to comment on each of the policies and to add any other policies thought to have been left out.
Second round analysis	The results of the second round questionnaire were analysed by adding the scores from the Likert scale analysis together for each of the policies. Those policies with the highest scores were seen to be the most relevant to PG management and PG change. The top 5 policies were then chosen as a focus for the rest of the research. Five policies were chosen based on the time and resources available for a more in depth analysis. The second round represented the last round of the Delphi given that the results so far had been meaningful and interpretable, with appropriate consensus. A third round would have been too time consuming, taxing for the participants and may not have returned any different results (Schmidt, 1997).

Although there are many advantages of the Delphi technique, particularly when attempting to assess the relative importance of certain aspects and to reach consensus among a dispersed group, there are also significant limitations. Aside from the time-consuming nature of the Delphi technique (Hsu & Sandford, 2007), one such limitation is based on the reliance on feedback between rounds. Cyphert and Gant (1971) concluded that the Delphi technique could, "be used to mould opinion as well as to collect [data]" (p. 273), as there is much opportunity for the researchers to present the results of previous rounds in a way that facilitates certain outcomes. This can be done both consciously and unconsciously by the researchers. It could mean that there is subtle pressure for participants to conform with the group, where tendency to disagree or offer alternative options may be ignored (Witkin & Altschuld, 1995, p. 188). Within this Delphi, it was recognised that there were limitations on the number of policies that could be taken forward into the next stage of the research and therefore the second round presented a reduced list of policies than was given in the first. This may have encouraged a false sense of consensus,

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which may have caused participants to question less the appropriateness of the listed policies. However the policies presented were based on the ranking associated with mentions and therefore represented the most commonly mentioned policies.

The policy Delphi consultations thus triangulated against the literature analysis. The results (presented in section 4) allowed the completion of the mapping exercise. It created a policy list consisting of a combination of EU-level policies applicable in each EU Member State (9 policies), with the exception of Switzerland, and national/sub-national policies unique to each case study country. The PG policy-mix thus contained between 9 and 16 policies in each country. This policy mix, including the underlying policy instruments, then became the focus of the subsequent coding, review and comparative analysis.

3.3.2 Identifying relevant national scale policies using an expert panel

In order to identify the national and regional scale policies relevant for PG management in each case study area, the Delphi process was supplemented with discussions with individual experts in each country ('Blue Ribbon' panels). The aim was to identify a minimum of five key experts from within five key stakeholder interest groups:

- The public interest/ government interest.
- Environmental interest.
- Farmer interest.
- Special interest such as cattle, milk, or grassland production.
- Academic institution/research group.

These groups represent the spectrum of those most closely engaged in and affected by PG management decisions. The stakeholders were approached based on networks already established by the researchers, as well as through the SUPER-*G* partner and participant networks. A snowball technique was used to expand beyond those networks. The experts were engaged in telephone, Skype or face to face informal conversations about the project and the aim of identifying the most relevant EU and domestic policies. They were specifically asked to comment on domestic policies. The conversations, combined with literature searches, and the knowledge of the research team helped to produce a list of relevant national scale policies. This was restricted to a maximum of five policies for the purpose of the research project. This meant that for each country there were 10 policies to further analyse, 5 at EU level (with the exception of Switzerland) and 5 national or regional level.

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3.3.3 Mapping relevant policies using Policy Analysis Table (PAT)

Once the policies had been identified, in-depth mapping of the policy instruments, aims, and outcomes was undertaken using official government documents and evaluations. The results were recorded using a Policy Analysis Table (PAT), formulated based on the underlying conceptual framework for the study. The PAT is an Excel-based template designed by the team to collect essential information required for mapping policy, policy logic, and to aid in the subsequent analysis of policy effectiveness, as stated by official policy originators, and comparison across the five biogeographic regions.

We used the Cascade Framework also to develop the PAT particularly with regard to the set of questions relating to policy instruments. The aim was to capture information about each policy from the perspective of each member state government (or regional/local government). The sources were a combination of state, county, or local level government documents, including official policy documents, government websites, and evaluations commissioned by governments. The governmental perspective was chosen for this evaluation of effectiveness to better understand the official picture of the policies. This would later be supplemented with an end-user analysis from a variety of stakeholders who use, implement, and are affected by, the policies and the policy instruments on the ground (see section 4.3).

The PAT covered categories about the policy as represented by Figure 5. This first section provided a policy description and was inspired by extent policy mapping projects (e.g. Bainbridge *et al.* 2011). The second section captured the policy's rationale, monitoring and outcomes. The operationalization of this section was heavily inspired by the UK's Green Book (HM Treasury, 2018). The third part records information at the level of policy instruments or the specific regulations, incentives, or information that are part of the overall policy (see questions 22-50 in Appendix C). This part is inspired by Van Zanten et al. (2014) and the cascade framework logic which recognises multiple mechanisms through which policy instruments, actors and policy logic interact.

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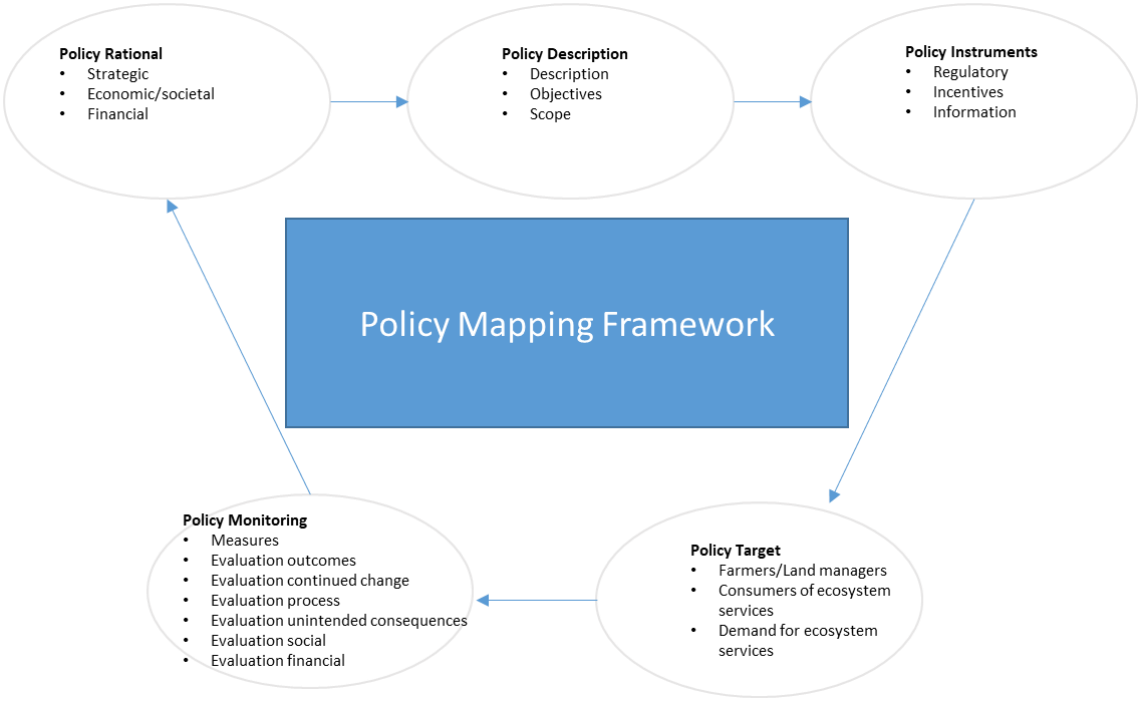
Figure 5. Overview of the policy mapping framework.



Source: own representation.

3.3.4 PAT Coding Protocol

The coding process was completed simultaneously across case study areas and the process was iteratively developed, including development of standard protocols for the searching and reporting of information. For documents in languages other than English, the relevant aspects were translated and recorded in the PAT in English to make later comparison easier. The information recorded in the PAT was copied directly or closely paraphrased from official government documents. Where there was ambiguity or need for the researcher to record their own thoughts, this was identified in the PAT to maintain an awareness of the sources of the information.

After completion, the PATs were summarised in smaller tables for use in subsequent interviews; to communicate the key information to the interviewees and begin discussing the impacts, implications and effectiveness of the policies.

There are significant limitations of this method; it is time and resource intensive and not all instruments for each policy can be recorded. It is also very reliant on the availability and access of information about the policy. Some countries are more consistent than others in publishing information and evaluations and some policies are better documented and monitored.

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Information is often reliant on the particular stage in the cycle of policy evaluation and how recently they have been reformed. It is also dependent on the political context of each country and the governance arrangements for the administration and implementation of the policies. The PAT is therefore not an exhaustive mode of recording information about the policies. However, it does begin to reveal the logic of the policies as well as the modes of evaluation and the recording of impact or outcomes.

3.4 Evaluating effectiveness via stakeholder interviews

In order to validate the policy mapping, and to give a bottom-up analysis of the effectiveness of policies relevant to PG management, at least 10 stakeholders from each case study country were interviewed (51 in total).

Interviews were used to investigate the diversity of meaning, opinion and experiences in relation to the policies (Valentine, 2005), and offer a chance to compare and analyse the diversity of experiences and descriptions across multiple stakeholder groups (Miller & Glassner, 2016). Such an approach acknowledges the ability of interviews to provide the stakeholders with a platform, to use their own words and descriptions to reconstruct and portray their activities, and experience in a way that is meaningful for them (Rubin & Rubin, 2005; Presser and Sandberg, 2015). The emphasis on meaning for the stakeholders was an important aspect of the method, giving them a chance to express their opinions and to construct their own narrative (Kvale & Brinkmann, 2009). These modes of analysing were helpful when attempting to better understand the effectiveness of the policies. Written information in official government documents could be compared, contrasted to, and reflected against, the opinion and experience of stakeholders working with the policies on the ground.

Each partner in task 4.1c identified relevant stakeholders using a combination of desk research, tacit knowledge and input from the expert panel used to identify the relevant policies (Raum, 2018).

The 10 interviews aimed to cover stakeholder representatives that have or ought to have an interest in PG policy. Each country team was required to have at least one representative from government, academia, farmer, and special interest groups. Each interviewee would represent the expert view from their interest group (e.g. Kohler et al., 2017). Although the small sample means that individual biases can have disproportionate influence, the interviews allowed information to be disclosed about the policy system from each interests' perspective as an

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indicative insight. This information was checked against the document analysis when possible (e.g. Kohler et al., 2017). Beyond ensuring that at least one person was interviewed in these four groups, each team used a 'snowballing technique' to identify other stakeholders who have, or ought, to have an interest and who were the best representative or "witness" of the identified stakeholder group (see e.g. Reed et al. 2009). This also helped to ensure that within the small sample, the most interested or relevant stakeholders were sought. **Table 3. Stakeholder groups interviewed.**Table 3, below, provides an overview of the stakeholder groups and organisations represented in each country.

Table 3. Stakeholder groups interviewed.

Country	Stakeholder type	Stakeholder Name
SE	Government	Swedish Board of Agriculture
SE	Government	County Administration Board
SE	Government	Swedish Environmental Protection Agency
SE	Academia	University of Gothenburg
SE	Academia	Swedish University of Agricultural Sciences
SE	Farmer	Swedish Federation of Farmers
SE	Farmer	Swedish Pasture and Herding Association
SE	Farmer	Natural Beef Society
SE	Special Interest	Green Farms
SE	Special Interest	Uppland Foundation
SE	Special Interest	Field Biologics
CH	Academia	Agroscope
CH	Farmer	AGRIDEA
CH	Farmer	SBV
CH	Government	FOAG
CH	Government	FOAG
CH	Government	FOEN
CH	Government	KOLAS
CH	Government	LDK
CH	Special Interest	Birdlife CH
CH	Special Interest	Pro Natura
UK	Government Advisor	Natural England
UK	Government Advisor	Natural England
UK	Government	Natural Resources Wales
UK	Farmer	National Farmers Union
UK	Academia	Centre for Ecology and Hydrology
UK	Special Interest	British Grassland Society
UK	Special Interest	Plantlife
UK	Special Interest	EU Forum for Nature Conservation and Pastoralism
UK	Special Interest	EU Forum for Nature Conservation and Pastoralism
ES	Academia	IFAPA
ES	Academia	UCO
ES	Farmer	COAG
ES	Farmer	Owner of dehesa
ES	Farmer	ASAJA

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ES	Government	CAGPDS (1)
ES	Government	ADROCHES
ES	Government	CAGPDS (2)
ES	Special Interest	ECOVALIA/FEDEHESA
ES	Special Interest	WWF
CZ	Special Interest	NCA CR
CZ	Government	AC CD
CZ	Government	SAIF
CZ	Farmer	APA CR
CZ	Farmer	Agrarian Chamber CR
CZ	Special Interest	MAU
CZ	Government	LAG
CZ	Academia	MENDU
CZ	Farmer	AACR
CZ	Special Interest	CMHU

3.4.1 Interview protocol

In line with the ethical principles and guidelines adhered to within the framework of the SUPER-*G* project (WP7), an interview protocol to guide the interviews with the identified stakeholders was created and ethical clearance was obtained from Newcastle University to conduct the study. Templates were created for documents used to approach and inform the stakeholders about the research project including invitation email, consent form, information sheet, interview questions and script (see Appendix D for full documents). Each case study country translated and adapted the documents accordingly.

It was made clear to stakeholders, before the interviews, that their words would be recorded, with their permission, and would be potentially used for direct quotes. However, their interviews would be stored confidentially (following a definition from Babbie, 2004) and their name would not be associated with their words in any written work. The participants were made aware that the name of their organisation might be used in association with their words in order to contextualise the knowledge and information. This information was provided in the consent form each received prior to their inclusion in the study.

The aim of the interviews were to gain insight into the opinion of the stakeholder about the effectiveness of EU and domestic policies relevant to PG management. Interviews were carried out between April and July 2019. The interviews followed the same structure across each case study country using the following question templates (translated to language of interview when not in English):

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1. (MAIN INTEREST OF ORGANISATION). What are the main interests your organisation represents about ES and/or PGs?

2. (RELEVANCE). Are the objectives of national "grassland policy" in line with the problems and interests your organisation represents? Please explain in general terms or with reference to specific policies.

3. (DEMOCRACY). How has your organisation been involved in influencing key decisions related to PG policy? Please provide examples on how (the) policy was influenced by or meets the needs of your stakeholders.

4. (LEGITIMACY). Do the individuals your organisation represents recognize the importance of PGs in providing the ES that matter to them? If so (or if they were made more aware), do they/ you support the policies currently in place? For example, do the policies (e.g. outcomes of, and processes and procedures of, the policies and policy delivery) match their/ your expectations and work for their/ your benefit)? If not, how do they go about achieving their goals or influencing a change in policy? Please provide examples.

5. (EFFICIENCY). Are the costs associated with national grassland policy (and/or a specific policy) justified by the benefits? Why do you believe this to be the case?

6. (IMPACT) Each policy that influences grassland management and ES makes claims about certain impacts. Are the claims being made accurate? What impacts have you seen? Please provide examples to specific policy claims.

7. (UNEXPECTED NEGATIVE CONSEQUENCES). Can you think of any negative, possibly unexpected consequences that arose (may arise) due to the policies (or specific policy) in place?

8. What changes would you like to see in (country of stakeholder) grassland policy in light of the political changes ahead (e.g. in terms of objectives, indicators, stakeholder engagement, etc.), why, and what challenges do you see for these changes to happen?

The interview questions allowed for a comparative understanding of the aspects of the effectiveness within the policies. In addition to the questions, interviewees were also presented with a summary table of the policies analysed through the PAT. This was in recognition that although the stakeholders may have specific knowledge and expertise, they might have a limited

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overview of the complex policies in existence. Therefore the table acted as a prompt and a source of information (to be disputed if the stakeholder had other experience or knowledge) in order to spark conversation and trigger ideas about effectiveness.

Interviews were audio recorded and either transcribed directly in the language of the interview, or notes taken by the interviewer were used to summarise the discussion. The interviews were then further summarised under each theme (see 1-8 above) in English to be shared amongst the research team for analysis. QSR International's NVivo 12 software was used to analyse the sub-themes appearing across countries in each theme.

Overall, the interviews gave an end-users view of the relevant policies and an insight from multiple stakeholders' perspectives about the effectiveness of the policies for PG management. It also allowed a broader contextual understanding of the experience of utilising and implementing policies on the ground as well as an insight into the hopes for future change.

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4. RESULTS

This chapter outlines the results of the Delphi survey and identifies the EU level policies that were taken forward to be analysed in each case study country (with the exception of Switzerland). We also present individual studies of each case study country, representing the five biogeographic regions (BGRs) within the SUPER-*G* project. Each case study details the contextual background of the area, the results from the policy mapping and from the interviews with stakeholders regarding perceived policy effectiveness for each country.

4.1 Relevant policies at the EU level

This section presents the results of the two rounds of the Delphi survey.

4.1.1 Results of the first round Delphi survey

The first round of the Delphi survey gained 29 responses. These responses were predominantly from stakeholders who identified as researchers at a university or research institute, and who were partners of the SUPER-*G* project. Some stakeholders identified as having multiple interests. The least well-represented interests were NGOs; societies, initiatives or associations; and non-partner researchers.

The responses represented nine countries (Figure 6). The majority of responses (31%) were from those who identified policies in a UK context. This is not surprising given that the survey was distributed first to attendees of an event taking place in the UK. Seventeen per cent of the responses came from stakeholders with knowledge of Italian context and 14% from a Dutch context, with six other countries contributing to the final third of responses.

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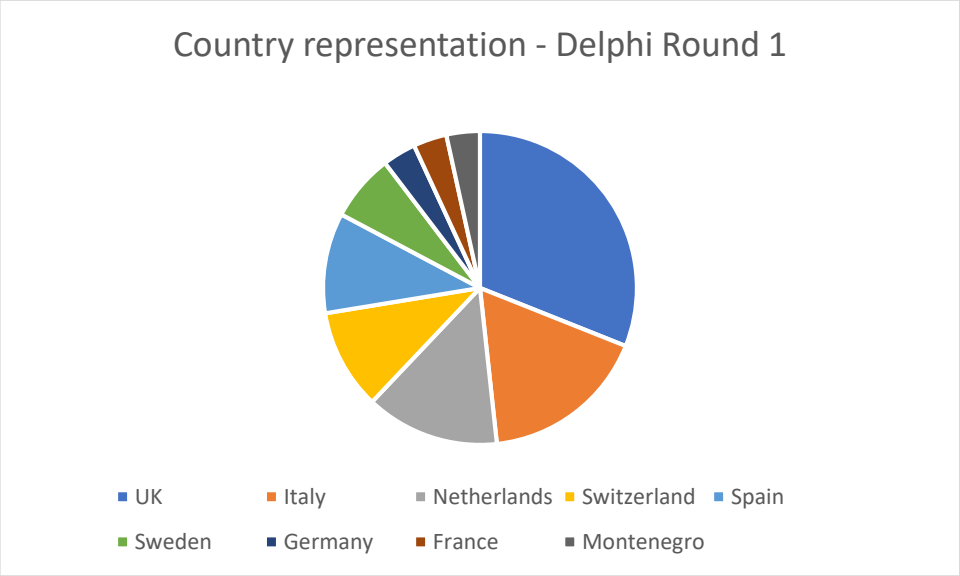
Figure 6. Representation of variety of national policy contexts reported in the first round Delphi survey.



Within the survey response 107 policies and areas of policy were identified, some of which were repeated several times. These responses are summarised in Table 4. In this survey, we have assumed that the number of times a policy is mentioned is an indication of its importance. This assumption is based on the need for this research to be relevant across different European countries, therefore the more widely applicable a policy the more important it may be internationally. The Delphi survey was used to try to identify the most important policies at the EU scale, and is supplemented by discussion with stakeholders in each country to identify the most relevant national scale policies – thus acknowledging that there is likely to be a different mix of important policies in each country.

The most frequently identified policies were those associated with conservation and biodiversity (30 mentions), which included policies such as Natura 2000, Habitats Directive, and the EU Biodiversity Strategy. Second most frequently identified policies included the CAP, for example, CAP pillar II RDP was mentioned 17 times and the CAP pillar I payments mentioned 16 times. Other policies mentioned covered carbon storage and climate change, food and food security, water, forestry, sustainability, regional and land policies, and international relations and financial support.

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Table 4. Policies and policy themes mentioned in the first round Delphi survey.

Policy/ theme	No. of mentions	Details	No. of mentions	Extra information
Conservation/biodiversity	30	EU Natura 2000	7	
		Specific national policies around nature/ conservation.	7	Creation and protection of agricultural park (Italy), B Natsch G (Nature conservation) (Germany), Conservation of PG by Scottish Gov (UK), Direktzahlungsverordnung, (DZV) – high nature-value PG protection (Switzerland), Environmental Impact Assessment (UK), FFH (Switzerland)
		EU Habitats Directive.	5	
		AES for biodiversity/ conservation.	4	Agri-environment measure 2. Support to agricultural biodiversity (Montenegro), Agri-environment schemes - (Milyostod). 1. For general values 2. Special values often flora (Sweden), AES (Germany), GEAC (Sweden).
		EU Biodiversity Strategy.	3	Biodiversity Strategy 2011 (Spain), Biodiversity Strategy 2020 and Biodiversity Action Plan (Switzerland).
		EU Birds Directive.	2	
		Countryside Stewardship Scheme.	2	(UK)
RDP (CAP pillar II)	17	AES, good management practices, tools and approaches.		Similar to some of the items mentioned in AES for conservation/ biodiversity – but these answers specifically mention RDP.
CAP Greening (Pillar I) and direct payments	16	Cross-compliance, incentives, basic payments, green payment, eligibility requirements, management, support, subsidies.		Most directly mention CAP, but two (Montenegro and Sweden) just mention direct payments.
Nitrates Directive	10	Organic fertiliser application, nutrient management, stocking rates.		

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Conversion (of grassland)	7	Includes regional ploughing restrictions (France), prohibition to convert PG (Germany), grassland quota (Netherlands), sustainable biomass production and protein crops promotion (Spain and Netherlands), renewable energy subsidies for biogas crops (Switzerland), organic as alternative to intensive (Montenegro).		Mostly national policies – these in addition to acknowledgement of the role of CAP to prevent conversion.
Carbon/ climate	5	Include climate change adaption (Spain), carbon sequestration (Italy), Carbon crediting (Netherlands) and tool to measure emissions (Ireland).		Mostly national policies.
Food/ Food security	4	Quatre pour mille (Switzerland), milk quota (Germany), labelling practices (N. Ireland), food and feed production (N. Ireland).		Mostly national apart from Quatre pour Mille – international not EU.
Forestry	3	Scottish Forestry Strategy (UK – Scotland x2), EU Forest Strategy (Spain).		
Water Framework Directive	3	All refer to UK application of EU WFD.		
Financial instrument	2	LIFE (EC Financial Instrument for the Environment. LIFE + 2014-2020 (EC regulation 1293/2013) (Spain).		
Regional policies	2	Two specific regional policies (Spain) about agrosilvopastoral systems and extensive livestock production.		
Sustainability	2	EU policies referring to SDGs and Action for Sustainability (Switzerland).		
Support for marginal areas	2	Area of Natural Constraint payments (N. Ireland), support for use of mountain pasture (Montenegro).		One clearly EU policy, the second may be national.
Environmental Action Programme (EAP)	1	EU EAP (Switzerland).		
Advice	1	Information provision (Ireland).		
International Relations	1	Partnerships with African, Caribbean and Pacific countries (Switzerland).		
Land policy	1	Short-term land tenure (UK - Scotland).		

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The reasons stakeholders gave for the influence the policies had on PG and therefore the importance of the policies were varied.

Biodiversity policies

For biodiversity polices (including Habitats Directive, Natura 2000 and other conservation policies), 10 of the participants noted that the influence of the policies on PG management came through limitations on management or special conditions for management, including affecting cutting, grazing, water management and manure application. Six participants mentioned that such policies help to maintain high biodiversity, protect species and species richness (protected areas) and maintain ecological quality. Others mentioned the policies influence PG through their aims to conserve and protect; through affecting where PG is placed; through affecting payments farmers receive for areas of permanent pasture; through supporting traditional farming; and through creating a network of protected areas. One participant was not sure of the way that the policy influences the PG management. This shows that the mechanism for influence is not always clear or well known.

Participants also commented on the reasons for the importance of the policies they listed. For biodiversity policies, the reasons for importance were more varied than the mechanism of influence on management, and sometimes overlapped. Four participants mentioned that the policies were important because they improve, protect and maintain biodiversity. Three participants mentioned that they were important for preventing abandonment and ploughing up of PG. Others mentioned the importance of protection for specific species; prevention of intensification; influence on payments; cultural values; that the policies encourage tourism; that they help balance farming and wildlife; that they apply across scales; that they fit with cross compliance; that they help protect water quality, soil carbon and reduce NO emissions; that they help promote more environmental agriculture; and value PG as a protected area. These factors show that the biodiversity policies are perceived to be linked to the production and maintenance of varied ES.

CAP policies

For the CAP policies (mostly Pillar I, including greening and direct payments, as well as only reference to ‘CAP’), a number of participants reported that the way in which such policies influence PG management is through incentivising greening; through stimulating farmers to stay

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in livestock farming; through direct payment for particular practices; and through restrictions on management. Other ways in which PG was perceived to be influenced was through the conditions on payment; limiting conversion of land and allowing grassland to exist by providing income support; environmental regulation through Good Agricultural and Environmental Conditions (GAEC); and through protection of environmental sensitive grassland. Two participants identified negative influences on PG management including encouragement of commercial scale farming and disconnection from nature, and converting grassland to cropland.

Six participants associated the importance of the CAP policies with maintaining grassland and preventing decline. It was also associated with the opposite, negative consequence by two participants, through providing less investment in retaining PG. This shows that although there are more experts who have reported the positive influence of the CAP policies, a number of people believe that they are or could be having an opposing effect. This highlights the importance of studying such policies more closely. Others reported that the CAP policies are important simply because of their power as a policy; that they provide a fair income; that they help avoid decline of the rural population; that they are a good system (but difficult to implement); that through greening ES are acknowledged and the social demand for ES is acknowledged; that ES are maintained, such as soil organic matter, soil structure and water quality; and that they encourage the adoption of environmental and climate actions, which help meet climate targets. This assessment of CAP policies shows that there is an important role for such policies in rural life and in protecting environments.

Other policies

Other policies were also assessed by participants for their influence on PG and for their importance. Similar themes appear in the influences and importance including maintaining PG area, or prevention (or encouragement) of conversion, encouraging environmental practices, providing a framework and guide to practice, maintaining multiple ES, and supporting livelihoods. These reflections, although not taken forward into the next Delphi round, formed an important part of the overall assessment of the policy mix across the European countries and demonstrated the links that were perceived by the experts between policies, actors and environments.

As a result of the first round Delphi survey 16 policies were chosen based on the information given by the respondents. The research team decided to exclude CAP Pillar I policies from the

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second-round survey as they were seen as a priority for further study given the issues raised in the first round of the survey, and based on knowledge of the policy environment for PG management. The majority of policies included in the second-round survey were those identified by the first-round participants (both directly and indirectly relevant policies), supplemented by some indirect policies based on the findings of the research team. The policies were as follows:

Directly relevant for PG management:

- EU Nitrates Directive.
- Rural Development Policy/ Rural Development Programme (CAP Pillar II).
- EU Habitats Directive.
- Natura 2000.
- EU Birds Directive.
- EU Water Framework Directive.
- EU Forest Strategy.
- EU Biodiversity Strategy (/Biodiversity Action Plan).

Indirectly relevant for PG management:

- EU Renewable Energy Directive.
- EU Sustainable Use of Pesticides.
- EU Strategy for the promotion of protein crops.
- Urban Agenda for the EU.
- EU Law on organic production.
- Quality Regulation (including labelling of 'Mountain Products').
- EU Climate Change Adaption Strategy.
- EU Action for Sustainability.

Each of these policies was presented with a description and a Likert scale from 'not at all relevant' to 'very relevant' and an option for 'don't know/ unknown', as well as comments.

Note on limits of the Delphi design: The Delphi question within this research was designed to elicit policies that mostly had a positive influence of PG management. This is because the researchers assumed that the positive effects of policy are the most articulated and discussed in policy evaluation and therefore easier to identify within documents and through discussion. However, it is also important to recognise that there may be policies missing from the analysis

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that have a negative effect on PG management, that may be more peripheral, but still impactful, to the system including, for example, market driven policy. Some participants did recognise the negative influence of some of the policies listed in the first round but may find it difficult to fully assess or think about negative influence, as it is less overt and may be indirect.

4.1.2 Results of the second round Delphi survey

In the second round of the Delphi survey, there were 30 respondents. Again around 30% identified as researchers associated with the SUPER-*G* project, 17% as farmers or representatives of farmers unions, 13% as government officers, and the rest as other stakeholders including business, non-partner researchers, consultants, policy makers, non-university researcher, association representatives and NGOs. Seven countries were represented with 23% from UK, 23% from Spain, 17% from Poland, 17% from Czech Republic, 13% from Sweden and the remaining others from Germany and Netherlands.

Table 5 shows the results of the second round Delphi. Each of the policies was assigned a score from each participant based on the Likert scale assessment. High scores indicated higher relevance. These scores were added up to reveal the policies with the highest combined scores and therefore the highest relative relevance.

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Table 5. Results of the second round Delphi survey. The four highest scoring policies (most relevant) were chosen to be analysed further in the research project (green highlight).

Name of Policy	Combined Score
RDP (CAP II)	131
Nitrates Directive	118
Habitats Directive	112
EU Climate Change Adaption Strategy	106
Water Framework Directive	102
Natura 2000	102
Birds Directive	98
EU Action for Sustainability	95
EU Law on Organic Production	93
EU Strategy of the Promotion of Protein Crops	90
EU Biodiversity Strategy	89
Sustainable Use of Pesticides	89
Renewable Energy Directive	85
EU Forest Strategy	74
Quality Regulation - Mountain Products	73
Urban Agenda for the EU	46

The table reveals that the most relevant policies were seen to be mostly directly influential policies, mainly focused on environmental, biodiversity and sustainability concerns. The most irrelevant policies were seen to be those indirectly affecting PG management and associated with urban development and products.

We chose the first four most important policies (in addition to CAP pillar I) to take forward for more in depth analysis within the rest of the project (highlighted in green on Table 5). These included Rural Development Programme (CAP Pillar II), Nitrates Directive, Habitats Directive and

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EU Climate Change Adaption Strategy. All such policies use a variety of instruments to implement their policy aims and objectives. These are explored within the PAT analysis.

The five core EU level policies chosen through the Delphi process were supplemented in each of the five case study countries by up to five domestic policies relevant for PG management, gained through the interviews with a local panel of experts in each country. The results of the EU and national level policy analysis are presented for each case study country in the next section.

4.2 Policy effectiveness: Case Study Country profiles

Each country has a unique social, political, environmental and economic context in which the policies identified are operating. In this section, the results of the policy analysis in each case study country are presented. First, each profile details the extent of PG in each country and the issues and challenges surrounding PG management, secondly the governance structure and political context is discussed. Each profile presents the details of data collection and results of policy mapping including summaries of PATs and policy logic. Finally, key findings from the stakeholder interviews are presented and summarized.

4.2.1 Czech Republic – Continental/ Pannonian BGR

4.2.1.1 Characteristics and distribution of permanent grassland in the Czech Republic

The total area of the agricultural land of the Czech Republic is 4.2 mil. ha, which is 53 % of the total land area of the Czech Republic (7.8 mil. ha). Arable land covers 2.9 mil. ha (i.e. 37 % of the total land area and 70 % of the agricultural land). The land use structure in the Czech Republic is shown in the Figure 7 and Figure 8.

The agricultural land of the Czech Republic is located in rugged soil and climatic conditions, which corresponds to the location of the Czech Republic as a source of many watercourses, mountains, but also large lowlands. These natural conditions are also linked to extreme phenomena in the landscape, such as floods or long-term drought. Only 20% of agricultural land is medium to very high-productive soil, 48 % soil with lower or very low production ability and

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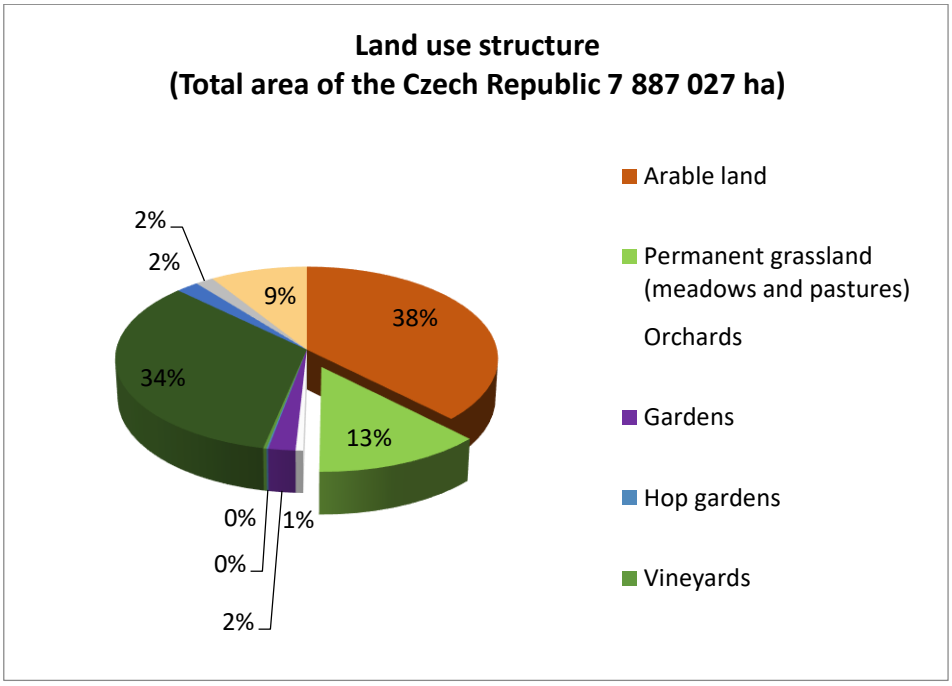
32 % soil with low production significance or insignificant for production (Situation and Outlook: Soil 2018).[3]

More than 20% of the agricultural land is distributed at an altitude above 500 meters above sea level. Areas with higher altitudes can be considered less favourable in terms of agricultural activities. Due to the relatively high population density of the Czech Republic, however, agricultural activity has a tradition in these areas, and is operated to a limited extent up to 1,250 meters above sea level.

Figure 7. Land use structure (Czech Republic 2018).



Source: State Administration of Land Surveying and Cadastre

[3] The quality of the agricultural land is measured based on the bonitation of the agricultural land. Approximately 9% of agricultural land is very to highly productive soil, 11% is soil with medium production ability, 48% is less to very low production soil and up to 32% is low to low significant production and insignificant. (Situation and Outlook: Soil 2018, http://eagri.cz/public/web/file/611976/SVZ_Puda_11_2018.pdf.)

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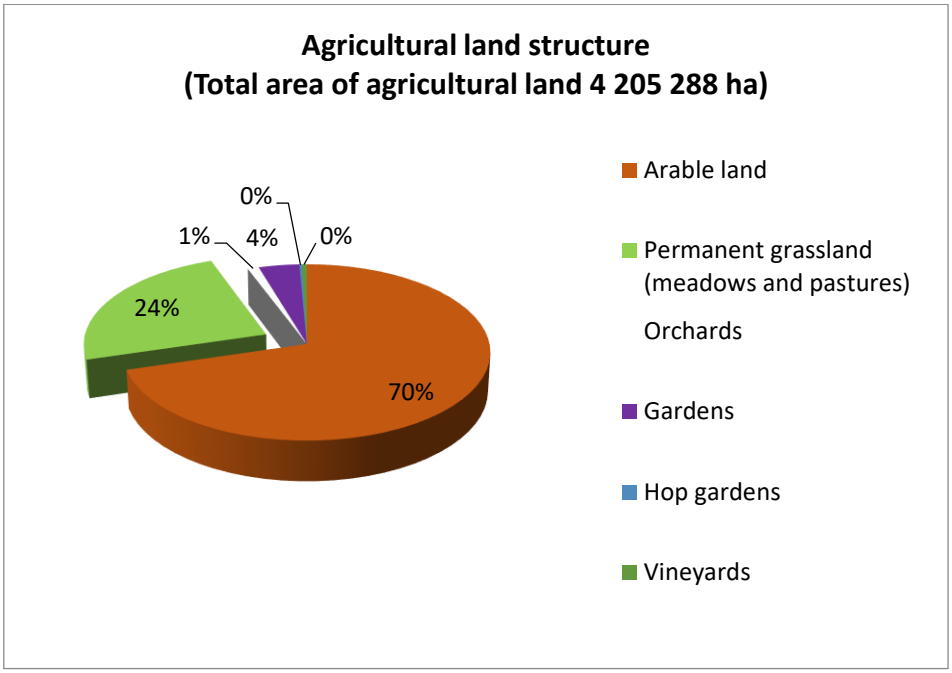
Figure 8. Agriculture land use structure (Czech Republic, 2018).



Source: State Administration of Land Surveying and Cadastre

Permanent grassland (meadows and pastures) covers an area of 1 mil. ha in the Czech Republic (i.e. 13 % of the total territory of the Czech Republic and 24 % of agricultural land area). Most grasslands have been created and maintained by human activities. Regular use thus enabled the predominance of certain ecotypes of meadow species, which have adapted to human management for centuries. This link has preserved the semi natural grasslands in a form that we now consider to be optimal in terms of species richness. Much of the *PG* is situated in marginal and border areas of the Czech Republic (Figure 9 and Figure 10). Abandonment of grasslands thus usually leads to their gradual disappearance.

As shown in Figure 9 and Figure 10, *PG*s are distributed predominantly in mountain and sub-mountain areas. In general, the higher altitude the higher share of PG in the total area and used agricultural area. A higher share of *PG* is also found in lower areas of the north-west Bohemia due to collapse of large scale faming in these regions after the disruption of state farms.

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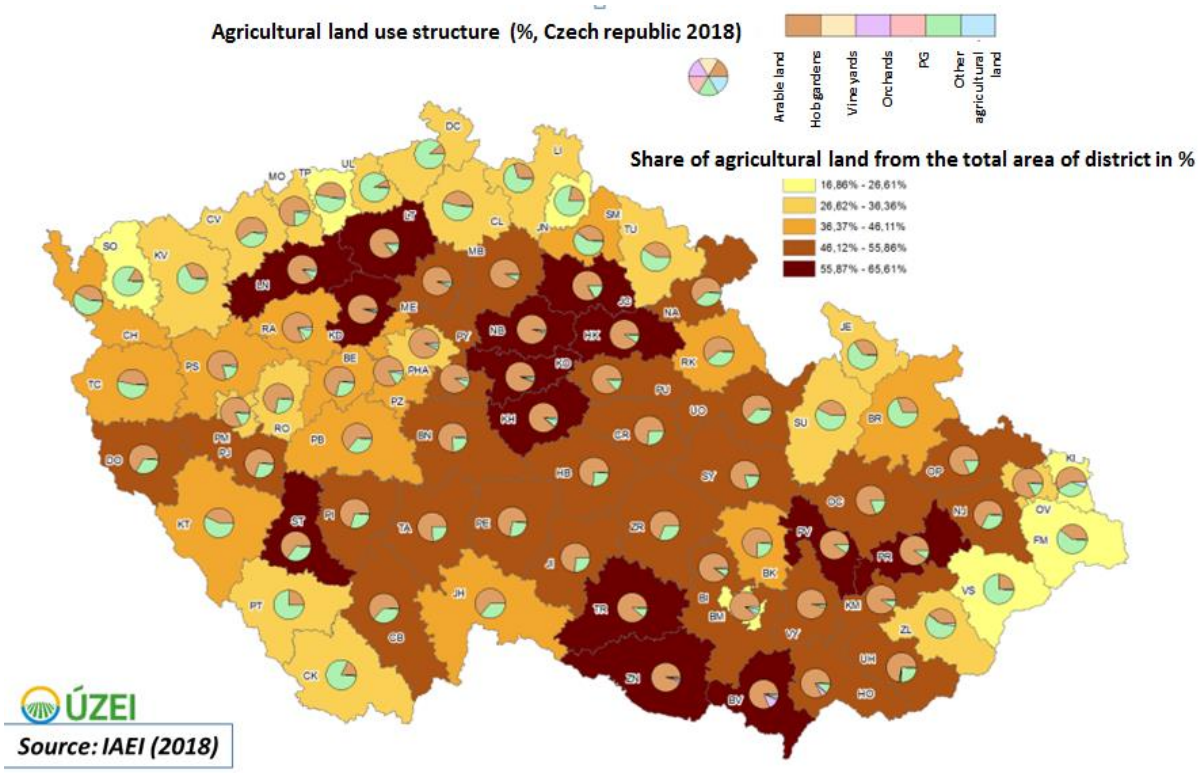
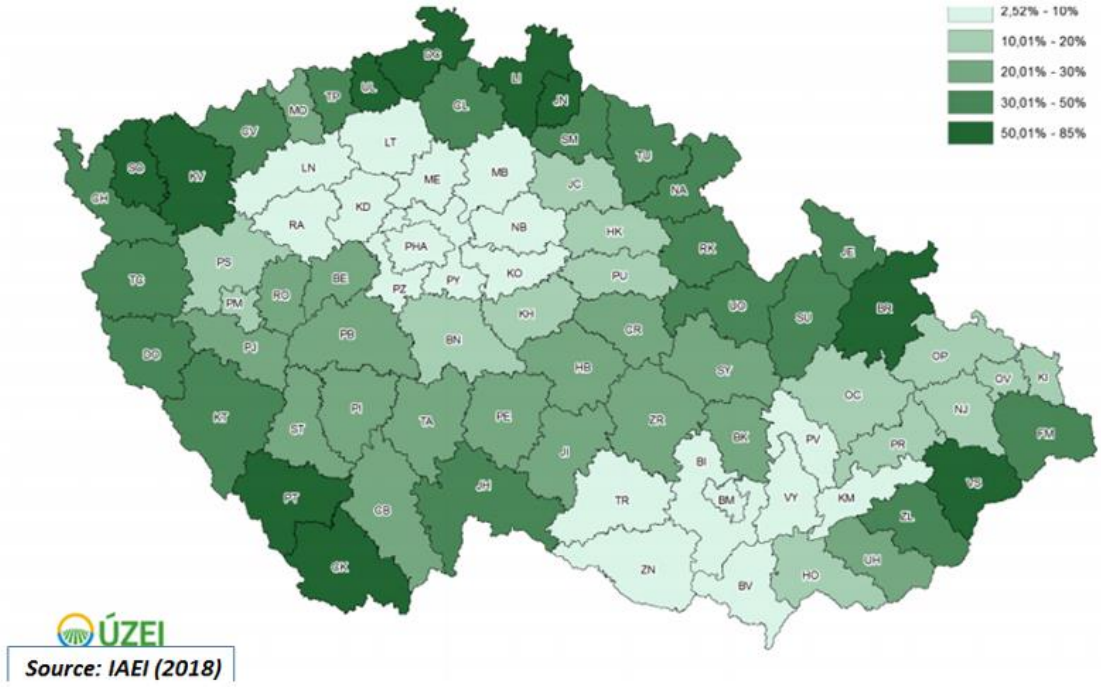
Figure 9. Agricultural land use structure and share of PG on the total agricultural land.



Source: Ministry of Agriculture: Situation and Outlook: Soil 2018.

Figure 10. Share of PG on the total agricultural land (%, Czech Republic, 2018).



Source: Ministry of Agriculture: Situation and Outlook: Soil 2018.

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In the last decade of the 20th century, there was a great reduction in livestock numbers and consequently a significant reduction in the intensity of grassland management. A large part of the acreage of grassland was left fallow or used extensively. The largest areas of unused lands were in border mountain and foothill areas. In the absence of farming, undesirable species proliferated (e.g. broad-leaved dock, thistles, ragwort, etc.). At present, grassland is managed mainly within agri-environmental schemes, with some not being used for direct agricultural production.

The Habitat Mapping Programme coordinated by the Agency for Nature Conservation and Landscape Protection of the Czech Republic consistently mapped the areas and quality of natural grassland habitats. Hönigová et al. (2012) combined classification of habitat types of the Czech Republic with EUNIS and Corine Land Cover classifications to delineate eight semi-natural grassland habitat categories (see Table 6).

Table 6. Grassland habitat categories identified in the Czech Republic.

Code	Category	Area (ha)
	Semi-natural grassland habitat categories	
DG	Dry grasslands	7,604
AM	Alluvial meadows	16,005
MG	Mesic grassland	38,661
WG	Seasonally wet and wet grasslands	202,907
AG	Alpine and subalpine grasslands	5,259
FF	Forest fringe vegetation	406
SM	Salt marshes	99
HT	Heathlands	530
	Total grassland in the Czech Republic	
SG	Semi-natural grassland	271,475
P	Pastures and managed grassland	702,162
	Grassland total	**973,633**

Source: Hönigová et al. (2012).

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A. Permanent grasslands in Less Favoured Areas (LFA – now ANC)

The share of PG and natural components is often higher in areas that are identified as less fertile (i.e. highland and mountain areas, or inaccessible or abandoned land). The Czech Republic has a high percentage of agricultural land in mountain and border areas (Figure 11 and Table 7), with 50% of the total agricultural land defined as LFA in the Czech Republic. Of the total grassland area recorded in LPIS, grassland included in the LFA represents 86%.

Table 7. The share of permanent grassland in LFA in the Czech Republic

	Agricultural land total[1]		PG		PG share/AL total (%)
Type of area	Thous. ha	Share %	Thous. ha	Share %	
Mountain areas	523.9	14.7	378	38.2	72.2
Other less favoured areas	1049.4	29.5	331.7	33.5	31.6
Areas with specific restrictions	209.2	5.9	139.2	14.1	66.5
LFA total	1782.5	50.1	848.9	85.8	47.6
Unclassified areas	1772.8	49.9	141	14.2	7.9
Total area	3555.5	100	989.9	100	27.8

[1](+ ponds, afforested land, non-productive land)

Source: Ministry of Agriculture: Situation and Outlook: Soil 2018.

Figure 11. The share of grasslands on utilised agricultural land

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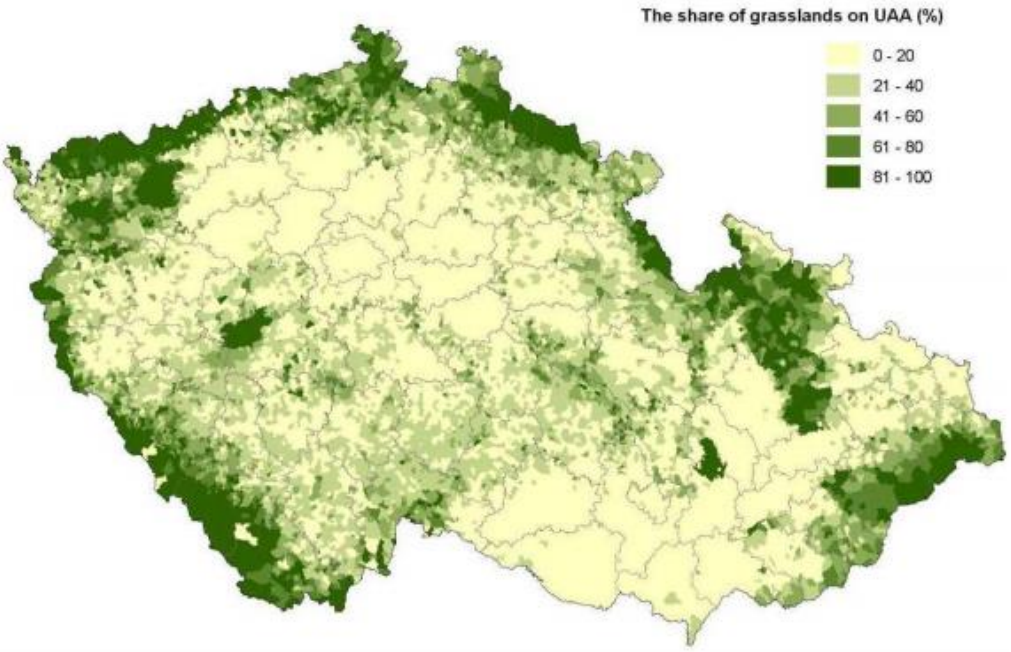

Source: Ratinger et al. (2011).

B. Permanent grasslands in protected areas

Societal concerns with the conservation of natural components of the landscape (whether original or formed by human intervention at the level of landscape units), has resulted in parts of the landscape rich in natural components being protected by law. That is why most of the specially protected areas, mainly large-scale protected areas, are situated in peripheries and only a few of them can be found in intensively utilised landscapes. The Czech Republic differentiates three basic forms of protected areas:

- Large-scale specially protected areas (national parks – NP, protected landscape areas – PLA).
- Small-scale specially protected areas (national nature reserves – NNR, nature reserves – NR, national natural monuments – NNM, natural monuments – NM).
- Protected areas under the Natura 2000 network (Special Protection Areas – SPA, and Sites of Community importance – SCI).

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Special Protection Areas cover a total of 15.9% (1,249,800 ha) of the Czech Republic (as there are potential overlays of categories, the number does not represent the sum of individual areas). In relation to the accession of the Czech Republic to the European Union, the Natura 2000 network was applied in the country to ensure protection of areas significant at the European level.[4] The area of Natura 2000 network in 2016 was 1,106,120 ha, i.e. 14.0% of the total area of the Czech Republic. The total area of protected areas pursuant to Act No. 114/1992 Coll. is estimated at 1,722,400 ha (21.8% of the CR area). As the categories partly overlay each other, the numbers are not mere sums. Table 8 gives an overview of the importance of agricultural land and share and PG in protected areas in the Czech Republic in 2016.

Table 8. The share of PG on agricultural land in protected areas in the Czech Republic.

Protected areas (ha) 2017	Agricultural land (ha)	PG (ha)	Share of PG/AL (%)
National Parks (NP)	7,818	7,434	95.2
Protected Landscape Areas (PLA)	296,588	186,323	62.8
Small-scale protected Areas (SPA)	6,759	6,000	88.8
Small-scale protected Areas (SPA) except NP, PLA	4,351	3,665	84.2
Specially protected areas without overlaps	308,757	197,427	63.9
Bird areas	122,179	81,674	66.9
European importance areas	103,521	89,182	86.2
Natura 2000 areas without overlaps	189,231	139,501	73.7
Protected areas according Act 114/1992 Coll. Specially protected and Natura	392,223	253,946	64.8

Source: Ministry of Agriculture: Situation and Outlook: Soil 2018.

C. PGs in organic agriculture

The use of agricultural land resources for organic farming and non-food production is gradually increasing. As of 3 April 2018, the total area of agricultural land used for organic farming was

[4] The network is based on two EU directives: Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) and Council Directive on the conservation of wild birds (79/409/ EEC).

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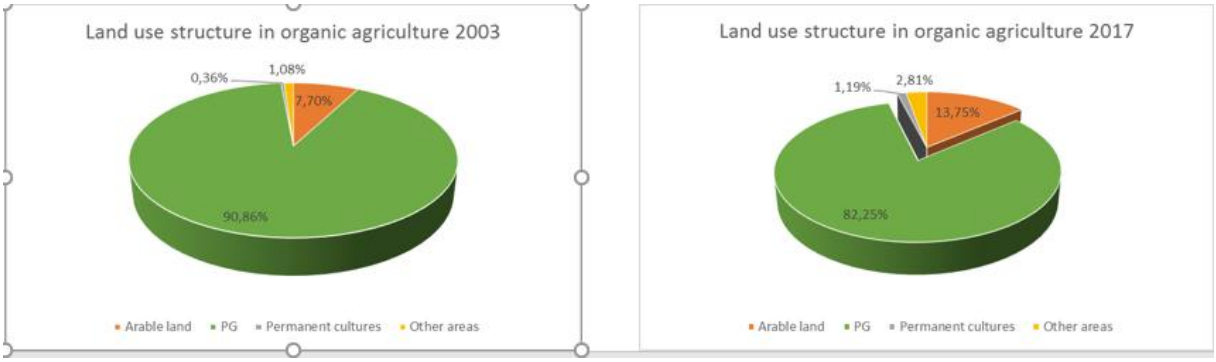
approx. ha, i.e. 12% of the agricultural land fund, which is comparable to the amount of organic farming in developed EU countries. PG represents 82% of total land managed organically. The amount of the subsidy for organic farming is determined by the Government Decree No. 76/2015 Coll., as amended, divided into the rate for the transitional period and the rate within the own organic production and its amount is determined according to the cultivated crop and method of cultivation. From 2015 to 2020, a new support system for organic farming was in place, as defined by Regulation (EC) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repeal of Council Regulation (EC) No 1698/2005.[5] The development of PG share in organic agriculture is shown in Figure 12 and 13.

Figure 12. Development of the PG share in organic agriculture (2003 and 2017).



Agricultural land area (ha)	2003	2005	2007	2009	2011	2013	2015	2017
OA Arable land	19,637	20,766	29,505	44,906	59,281	56,286	64,529	71,515
OA PG	231,683	209,956	257,899	329,232	398,061	412,158	407,448	427,717
OA Permanent cultures	928	820	1,870	4,331	7,429	7,837	6,839	6,205
OA Other areas	2,747	23,440	23,616	19,937	18,157	17,615	15,845	14,595

[5] The main strategic document in the area of organic farming development and organic food production is the "Czech Republic Action Plan for Organic Farming Development 2016–2020". The Action Plan was prepared by the Ministry of Agriculture in close cooperation with NGOs and was adopted by the Government of the Czech Republic on 20 November 2015.

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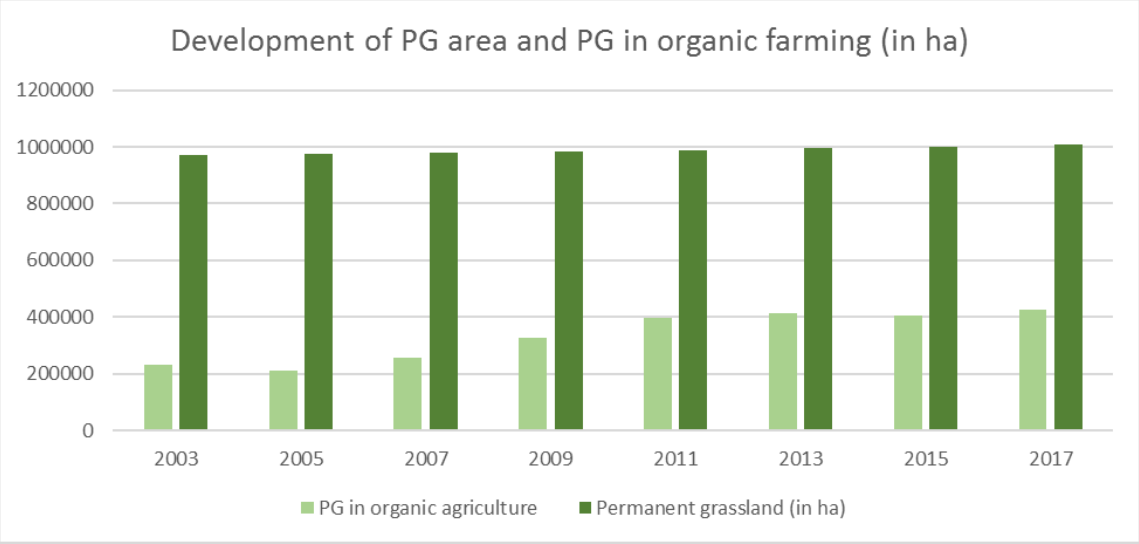
OA total land	254,995	254,982	312,890	398,406	482,928	493,896	494,661	520,032
Total agricultural land	4,269,218	4,259,480	4,249,177	4,238,975	4,229,167	4,219,867	4,211,935	4,205,288
Share of OA/Total AL	**6.0%**	**6.0%**	**7.4%**	**9.4%**	**11.4%**	**11.7%**	**11.7%**	**12.4%**
Share of PG on OA	19,637	20,766	29,505	44,906	59,281	56,286	64,529	71,515
PG (in ha)	231,683	209,956	257,899	329,232	398,061	412,158	407,448	427,717
PG in OA share on total PG	928	820	1,870	4,331	7,429	7,837	6,839	6,205

Source: Ministry of Agriculture: Situation and Outlook: Soil 2018.

Figure 13. Development of PG area and PG area in organic farming (2003 – 2017).



4.2.1.2 Brief description of governance structure and policy context

A. <u>The governance structure of the Czech Republic</u>

The Czech Republic is a parliamentary democracy. Its supreme law is the Constitution of the Czech Republic together with the Charter of Fundamental Rights and Freedoms. In its current form the Constitution has been valid since 1 January 1993, i.e. since the date the independent Czech Republic was established, as a result of the separation of Czechoslovakia. Power is divided into:

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- Legislative (Czech Parliament): the Parliament of the Czech Republic is made up of two chambers – the House of Parliament and the Senate. Every citizen who is at least 18 years old is entitled to vote for candidates to the House of Parliament and the Senate.

- Executive (Czech Government and the President of the Republic): the President of the Republic and the Czech Government are representatives of executive power within the country. The Government is the supreme body of executive power. It answers to the House of Parliament for its actions. As well as the Government, ministries and other administrative bodies are also part of the executive power. These can only be established, and their jurisdiction defined, by the law.

- Judicial: judicial power is executed by independent courts of law. During the execution of their function, the judges should be independent, and no one may threaten their objectivity. The court system is made up of the Supreme Court, Supreme Administrative Court, Supreme, Regional and District Courts.

The Constitution of the Czech Republic anchors the division of the Czech Republic into basic (municipalities) and higher (regions) territorial self-governing units. Municipalities are fundamental self-governing territorial units, while regions are higher self-governing units. In the Czech Republic, a joint model of public administration is applied, meaning that municipalities and regions exercise in addition to their own competencies also the state administration in delegated competence. The state administration in delegated competence is performed for the whole territorial district, which is delimited by law (regions, municipalities with extended powers, municipalities with authorised municipal office and municipalities). Self-government is performed only within the territorial unit, which is delimited by law (region, municipality).

Regional self-government is conducted across 14 regions, including the City of Prague (which is at the same time a municipality and a region). There are big differences between the populations of individual municipalities. The average number is about 1,600 citizens.

Municipalities in the Czech Republic administer their territories within the framework of independent competence. Within their self-competence, all municipalities and towns have equal rights and obligations. Execution of the delegated competences depends on the size of the municipality and the territory it administers. According to the scope of performance of the state administration in delegated competence, municipalities with the scope of delegated

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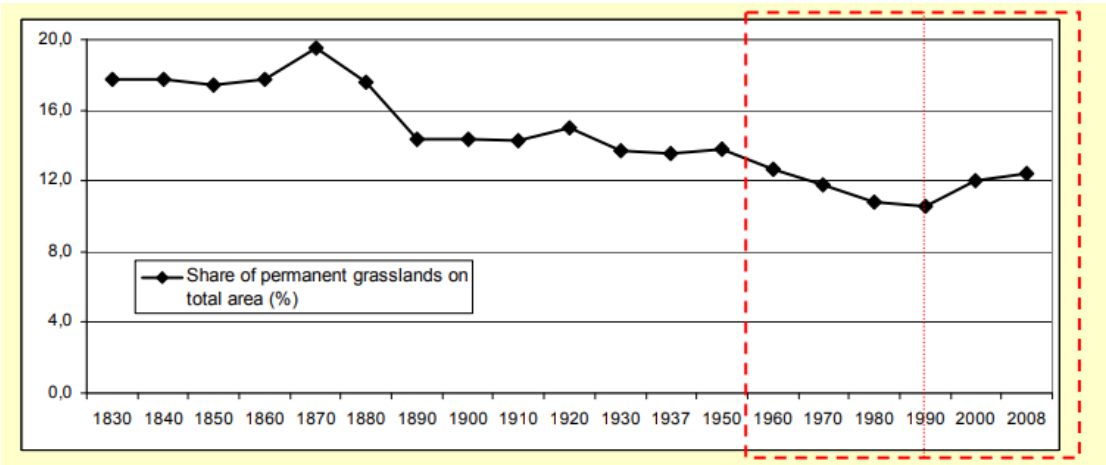
competence (i.e. all the municipalities) and municipalities with extended scope of delegated power can be distinguished. These municipalities perform the state administration in delegated power in the territory of other municipalities. Authorised municipal offices and offices with extended powers are included in this category of municipalities.

B. Historical context and the development of the governance structure

Societal driving forces have been the major influential factors in the past two centuries in respect to land use and land cover changes in the Czech Republic.

Grassland has historically been an important source of forage, but according to Mládek et al. (2006), during the historical development of agriculture, grassland areas used for this purpose have been decreasing in favour of arable land until the end of the 1980s on the territory of the Czech Republic – see Figure 14 and Figure 15. Poor soil in marginal areas shaped agriculture towards pasture farming with cattle and sheep, while only small strips of land were ploughed for cereals and potatoes. Lack of information and education retained low input and low mechanisation farming practices in the marginal areas even in the first half of 20th century. The extensity of land cultivation resulted in a specific symbiosis of agriculture and wildlife.

Figure 14. Decreasing share of PGs on the total area of the Czech Republic (1830 – 2008).



Source: Kabrda (2008).

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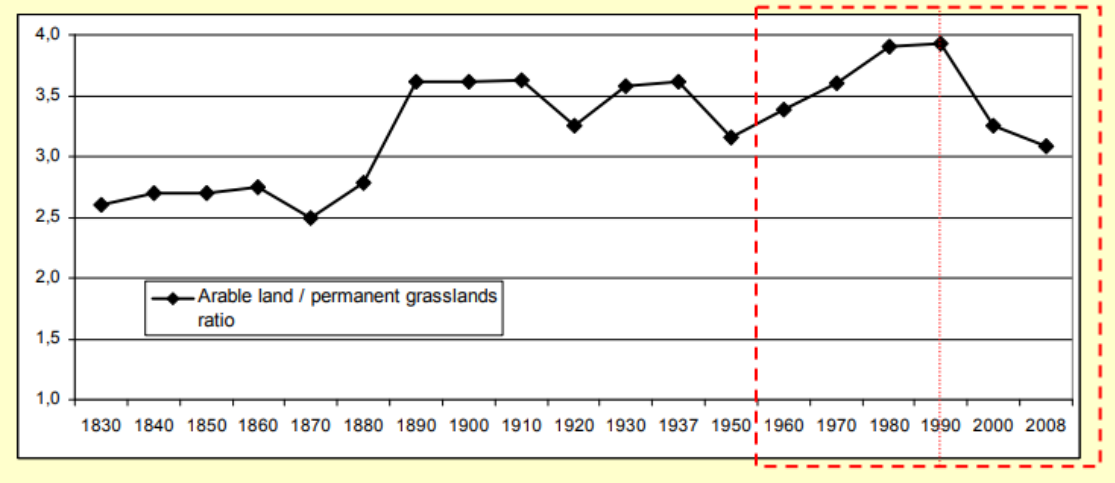
Figure 15. Arable land/PG ratio development in the Czech Republic (1830 – 2008).



Source: Kabrda (2008)

To understand the specific cultural situation regarding the relation between Czech farmers and the landscape, the specific development of Czech agriculture after WWII needs to be considered. First, the property of Germans, "collaborators" and "traitors" was confiscated and distributed to new settlers in the Czech border area in 1945. Second, in 1947, the 1919 Land Reform Review Act was adopted (originally directed against the nobility). It culminated in the expropriation of all land over 50 ha. Collectivization followed in the 1950s. At the end of the period of socialism, nearly 99% of all agricultural land was operated by cooperative or state farms.

This development led to some important changes in the Czech countryside and land use. The middle class disappeared. Many original landowners were expelled or their land expropriated. Although the cooperative farmers remained formally the owners of the land, they could not freely dispose of it. This led to a lack of connectivity between farmers and land. Moreover, in the 1980s, there was a mass merger of cooperatives that broke the relationship between villages and farms, leading to further disconnection, and resulting in Czech land managers perceiving the land to be a tool of production – not the heritage of their fathers.

However, Czech agriculture was modernised. The big agricultural companies were headed by university-educated professionals, who started to create a new middle class. Many people commuted for work from cities from which they brought urban life styles. The original farm buildings (stables, barns, etc.) close to rural houses were demolished or rebuilt and large facilities (livestock buildings, machinery and tractor stations) were built on the outskirts of

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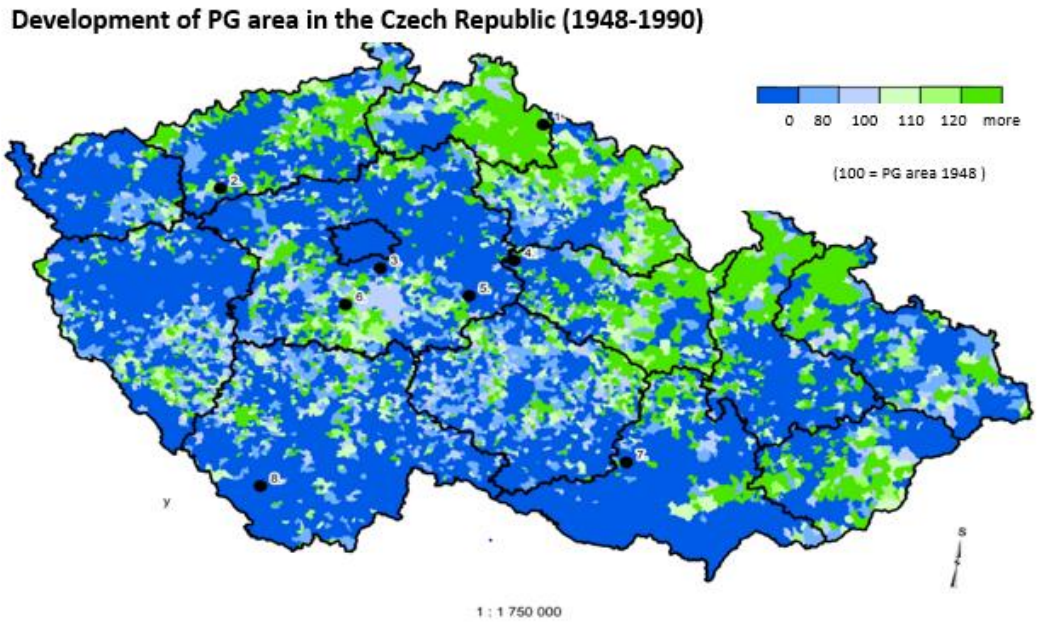
villages. In 1980, the social system in the Czech countryside consisted of 58% workers, 31% employees in service, and 9% cooperative farmers. During collectivisation, which occurred in the 1950s to 1980s, the Czech Republic experienced agricultural intensification, which in the lowlands became an economically more effective way to increase the level of production. In particular, the concentration of milk and beef cattle increased, with animals moved from pastures to indoor housing. Meadows were subjected to inadequate application of fertiliser and use of mechanisation to boost grass production. Therefore, agricultural production in hilly and mountainous regions decreased greatly (Figure 16). The map shows changes in the area of PG from 1948 in comparable territorial units formed by cadastre units or their groups. Values lower than 100% show a decrease in PG area in the units against 1948, whereas values over 100% represent an increase (Kabrda, 2008).

Figure 16. Distribution of changes in PG area in the Czech Republic (1948 – 1990).



Source: Landscape Atlas, Database of long-term changes in the use of land in Bohemia 1845–2000 (http://lucc.ic.cz).

The “Velvet revolution” in 1989 ended the era of the “socialist” economy (Figure 17). The split of Czechoslovakia into two independent states, Czech Republic and Slovakia, followed in 1992. Since the 1990s, there has been substantial economic change, generally characterized as the beginning of “transition”.

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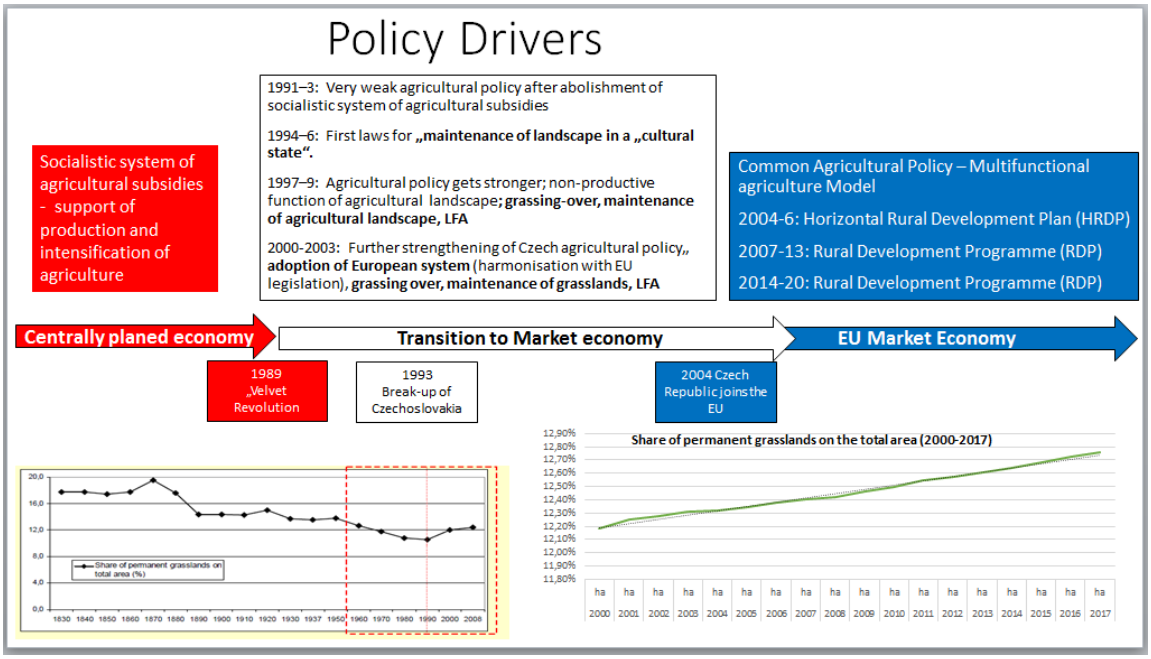
Figure 17. Socio-political driving forces of PG management changes.



Transition in the Czech Republic has been a process of moving society and the economy from a centrally planned economy to a market-oriented one. Property rights over agricultural goods changed substantially during this decade. Following market liberalisation and commercial reforms, farmers (as was the case for all other entrepreneurs) acquired economic property rights over their commodity output. Since then, farmers' incomes have depended on selling their products. Land reforms (Land Law, 229/91) returned titles to land to original (pre 1948) owners and their heirs in 1992-1993. In the case of the Czech Republic, Ratinger and Rabinowicz (1997) listed four outstanding problems with delineation of property rights to land: the lack of identification of plots in terrain; need for consolidation of divided property due to inheritance; permanent access to own land; and iv) unidentified/inactive owners, who were probably the heirs of the original owners. Agricultural policy was, after the abolition of the socialist system of agricultural subsidies, very weak.

Although the cooperative model was forced onto Czech farmers, they adapted to it and tried rather to adapt this model to the new conditions after 1989. All this led to the fact that most landowners showed no interest in doing business in agriculture and rented their land to big companies. The share of farms managed by individual farmers in cultivation of land did not exceed one third. As a result, the Czech Republic is a country with by far the largest average farm size in Europe and potentially with the largest share of farming in leased land. A new conflict

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originated between the needs of the productive oriented agriculture and the post-productive orientation of rural people.

Since the transition, the market adjustment (economic decline) of agriculture has partially relaxed the pressure on PG wildlife. In the first half of 1990s, the recession of milk and beef markets resulted in a rapid decline in cattle numbers. This has allowed intensification of production. The least productive land (meadows with difficult access and with restrictions on fertiliser application) has become due to reduced pressure to provide feed in these marginal areas economically unattractive to farmers (Figure 18). The map shows changes in the area of PG from 1990 in comparable territorial units formed by cadastre units or their groups. Values lower than 100% show a decrease in PG area in the units against 1990, whereas values over 100% represent an increase.

Thus, interest in using valuable meadows in production dropped and they were left fallow. The areas abandoned in the 1990s are now a mosaic of trees, shrubs and grassland. Their appearance and species composition significantly influence the natural conditions of the site, especially climate, soil properties and water availability (Kyselka, 2012). It was estimated that for example in White Carpathian region uncultivated area might reach 5% of agricultural land in the end of the 1990s (Ratinger & Křumalova, 2002). Moreover, they pointed out environmental regulations in protected landscape areas were initially restricting farming activities without compensation. The result of uncompensated regulations was not only the loss of income, but also the incomplete use (idling, abandonment) of land, which reduced the provision of landscape and wildlife in the PLAs the early 1990s.

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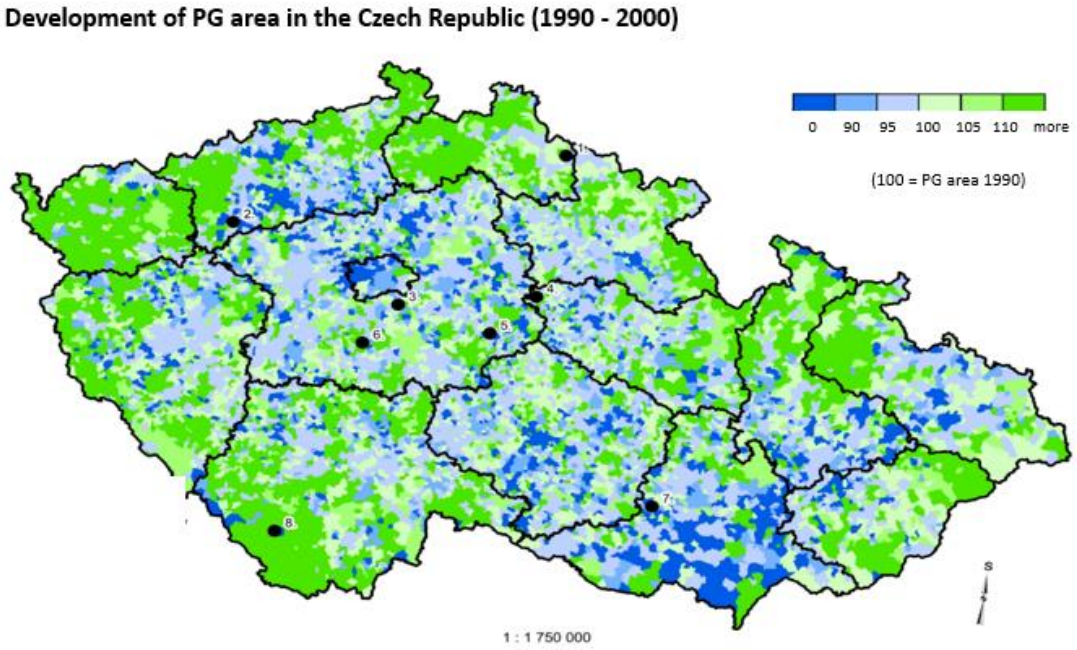
Figure 18. Distribution of changes in PG area in the Czech Republic (1990 – 2000 in %).



Source: Landscape Atlas, Database of long-term changes in the use of land in Bohemia 1845–2000 (http://lucc.ic.cz).

Improving the environment has been one of most urgent priorities of almost all Central and Eastern European Countries since political changes in 1989/1990[6]. The positive role of agriculture in rural environments remained unrecognised, and agricultural policy did not formulate clear agri-environmental objectives and measures during the early stage of transition (Ratinger, 1994).

The first laws for "maintenance of landscape in a "cultural state"were implemented in the mid-1990s. The Czech agricultural policy looked for new objectives and measures after the final act of UR GATT limited its market support objectives. The new agricultural policy, launched in 1997 has gradually introduced incentives for cultivating marginal areas. Agricultural legislation

[6] The framework for agri-environmental policy is given by overall environmental legislation and sector specific legislation. The first one rests on three key laws: the Environmental Act (law No. 17/1992) incorporating fundamental relations and links of environment protection policies; the Law on the State Environmental Fund (law No. 388/1991) completing the above mentioned act with financing and budgeting; Law No. 244/1992 including ecology among the criteria for the selection of all relevant human activities in the landscape. The second one includes the law on Fertilizers and Norms, Legal Restrictions, on Organic Fertilizer Management on Farms and Law 252/1997 with the accompanying Decree 341/1997 which both define programmes for supporting production of high nature value on farms. These legal bases would already permit the creation of a comprehensive agri-environmental policy rich in instruments and measures if objectives were well formulated. The last mentioned law will require prompt revision to make it fully compatible with the EU Act 2078/92.

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(Agricultural Law 252/1997 and following decrees on multi-functionality of agriculture) have increased this activity. The Decree 505/2000 recognises subsidies for partial compensation of economic harm arising from the management of less-favoured areas. Non-productive function of agricultural landscape; grassing-over, maintenance of agricultural landscape, and LFA were supported. The accession to the EU called for rapid harmonisation of policies with European legislation (EU CAP already modified by McSharry reform). Thus, the main driving force for modifying the rural environment stemmed from government (Ministry of Agriculture) implemented incentive systems in which farmers and landowners were the first agents of environmental change. Current policy formally encourages farmers to recognize the need to protect nature and ensure food security. In practice, farmers try to adapt their activities to individual subsidy programmes, which usually make up the majority of their income. In LFA, where ecological agriculture is more common, farmers are currently dependent on subsidies, and this must be accounted for in the development of future policy tools.

At the larger scale, protection of landscape and wildlife has been encouraged by subsidies from the Ministry of Agriculture. Initially (1997-2000) subsidies were focused on the support of landscape management (Governmental Decree 24/1998, 344/1999); in 2001, this was replaced by compensations for environmentally friendly practices in less favoured areas and areas with environmental restrictions (LFA payments, GD 505/2000). The distinction between them rests in the specification of requirements; earlier support programmes defined required or allowed practices on grassland, while later programmes compensate for higher costs resulting from restrictions or duties imposed by the environmental legislation (Ratinger & Křumalova, 2002). The control over agricultural land protection (Law 231/1999) is within the remit of the Ministry of Environment and local authorities (municipality or borough council).

The problem of mixed governance competencies arises from the fact that landscape and ES linked to PG can be viewed as a product (agricultural production – Ministry of Agriculture competence) but also as a resource (resource protection – Ministry of Environment competence). PG management delivers intrinsic value linked to the diversity and existence of species for the global society on one side and aesthetic value of landscape and visible richness of the nature to the local society on the other. Moreover, the Ministry of Regional Development of the Czech Republic governs the sustainable development of rural areas. This distinction seems to be essential because it has implication for the governance structure.

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- **The Ministry of Agriculture (MoA)** is the central body of the state administration for agriculture with the exception of protection of agricultural land resources, water management with the exception of protection of natural accumulation of water, water resources and quality of surface and ground waters, food industry, forests, hunting and fishing.
- **The Ministry of the Environment (MoE)** carries out protection in the area of water, soil, forest and mineral resources. The direct performance of state administration is within the remit of the Ministry of the Environment in the area of air, waste management, geological services and work for environmental impact assessment.
- **The Ministry of Regional Development (MoRD)** represents central government authority in the matters of regional policy, spatial planning, building rules, expropriation, investment policy, tourism, and undertaking.

The competencies in organization of the provision of agricultural and environmental goods (landscape and wildlife) of PG are divided between the Ministry of Agriculture and the Ministry of Environment at the national level continued in the same division at the local implementation level. Hence, there is more than one governance structure and these do not necessarily support each other.

All land as well as all activities related to nature are subject to environmental legislation (Law 114/1992). Requirements to manage grassland is not explicitly mentioned in the legislation. It can be seen as implicitly included in proper farming practices, but such a requirement can hardly be enforced. That is why contracting in PLAs is used for maintaining the highest natural values (a special treatment of the most valuable meadows) or for enhancing improvements with considerable cost. Splitting competencies between the Ministry of Agriculture and the Ministry of Environment at the national level continued in the same division at the local implementation level. Hence, there is more than one governance structure, potentially in conflict. In addition, the local (rural) population claim that most of the attributes of property rights to ecosystem services of PG reside with them and demand involvement in formulation of conservation local development priorities and in the organisation of conservation provision. This was reflected in the development of a participative approach and involvement of Local Action Groups and NGOs into the decision-making processes of the Rural Development Program.

Government policy relating to the management of PG has concentrated mainly on two instruments: restrictions and subsidies. The problem with time inconsistency of support

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programmes of Ministry of Agriculture was that it stimulated strategic and the risk averse behaviour of actors (Slangen, 2001, Ratinger & Křůmalová, 2002). The first years following political changes were characterised by the identification of relevant policies for PG management, and directions changed in a very short period. In the late 1990s, policy directions more or less stabilised protection of PG, its environmental function and its role in rural development. However, policy programmes continued to vary in their sub-objectives, implementation conditions and financial implications.

4.2.1.3 Details about the specific area of study

The Czech Republic is located in the zone of deciduous forest, which covers a large portion of its territory. The anthropogenic origin of grasslands is what makes them different from other natural habitats. Although the origins of grasslands have already been identified in the Neolithic era, many grassland localities have returned to forest, or been converted into arable land and back to PG (Jongepierová, 2008), which has contributed to the further species enrichment of habitats. An important milestone was the beginning of manuring around the middle of the 19th century, which enabled spreading of meadows outside the floodplain of water flows. Intensification of agriculture (drainage of wet meadows, stronger manuring, and sowing strong competitive species) led to a reduction of the original species diversity in the second half of the 20th century. Negative effects on vegetation resulted from the abandonment of difficult to access meadows. The Czech Republic is located in the zone of deciduous forest, which covers a large portion of its territory. The anthropogenic origin of grasslands is what makes them different from other natural habitats. Although the origins of grasslands have already been identified in the Neolithic era, many grassland localities have returned to forest, or been converted into arable land and back to PG (Jongepierová, 2008), which has contributed to the further species enrichment of habitats. An important milestone was the beginning of manuring around the middle of the 19th century, which enabled spreading of meadows outside the floodplain of water flows. Intensification of agriculture (drainage of wet meadows, stronger manuring, and sowing strong competitive species) led to a reduction of the original species diversity in the second half of the 20th century. Negative effects on vegetation resulted from the abandonment of difficult to access meadows, resulting in reversion to scrub and forest. As a result, these remote PG areas lose their characteristic biodiversity. Present species-rich meadows are a relic of extensive or moderately intensive farming of the years around 1850-1950 (Chytrý, 2007). Their importance for biodiversity and conservation of historic cultural

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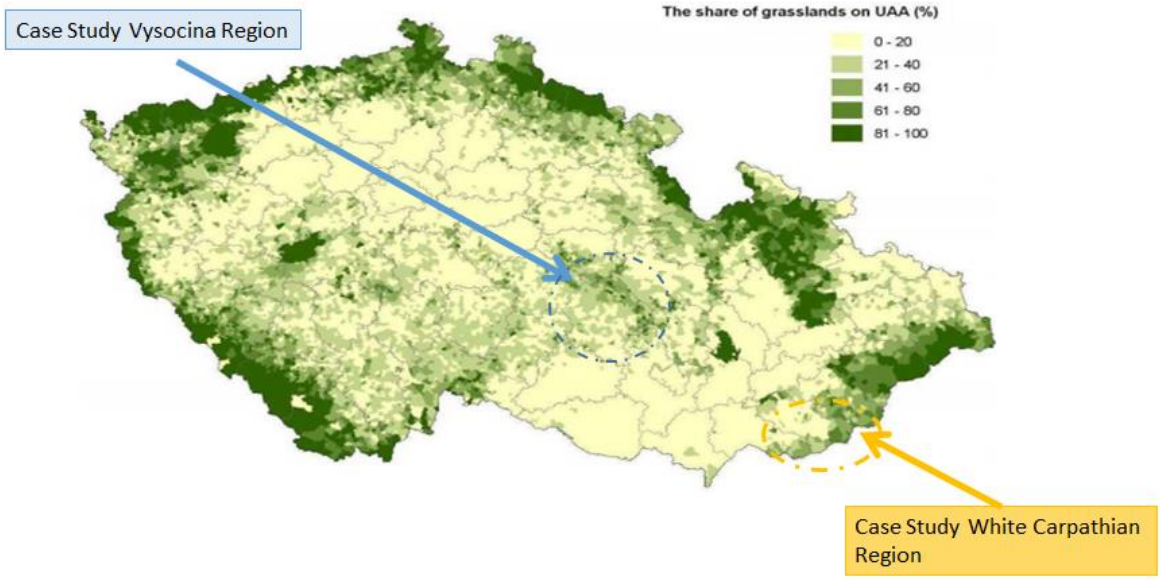
landscape is irreplaceable. Such meadows are now still relatively abundant, but vulnerable, and it is necessary to maintain them. The richest Czech traditionally managed meadows can consist of up to 75 plant species per square meter (Jongepierová, 2008), which is more than any non-grassland habitat. Grassland ecosystems are also species-rich zoologically, because they provide shelter for many animal species, especially insects. High biodiversity of grasslands is maintained by disturbances (mowing, grazing etc.) that can, if they come at the appropriate intensity and frequency, increase both alpha and beta diversity of landscape (Chytrý, 2007). Not all types of grasslands are extremely species-rich, yet all together they compose a diverse vegetation mosaic. However, some parts of the Czech Republic (e.g. White Carpathians) are unique for their high species diversity, despite the fact their abiotic conditions and vegetation are relatively uniform (Jongepierová, 2008).

The specific areas of study in the Czech Republic are located in the Pannonian (White Carpathians) and continental (Vysocina - Highland) biogeographical regions (**Figure 19**).

Figure 19. Location of Pannonian and Continental biogeographical regions cases of studies.



The main ecosystem services of PG in the Czech Republic include grass and livestock provision, biodiversity provision, carbon sequestration, erosion regulation, water flow regulation, nitrogen and invasion regulation and recreation.

Hönigová et al. (2012) in their Report to the EEA – European Topic Centre on Biological Diversity assessed multiple ecosystem services provided by semi-natural as well as managed grasslands

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in the Czech Republic. They summarised following findings of a pilot study on grassland ecosystem services in the Czech Republic:

- water runoff from grasslands with average annual rainfall typical for the Czech Republic (674 mm) based on runoff coefficients and CN curves typical for grasslands can reach 557 million cubic meters. Considerable fraction of water is infiltrated on grasslands and contributes to regulation of floods or droughts. In total, grassland water regulation service amounts to nearly 98 million cubic meters of water absorbed by grasslands.
- grasslands can reduce soil erosion rates by 2.2–2.5 Mg ha/yr in comparison with arable land. In total, grasslands save 2.1 million Mg of soil if compared with cropland erosion rates.
- grasslands regulate water quality due to dense root systems and nutrient filtration. Alluvial, wet and mesic grasslands can remove 61.7 Mg N annually.
- grasslands in the Czech Republic can sequester 550 Mg C annually, with pastures and managed meadows contributing 64 % to this total amount. Intensities of carbon sequestration differ among habitat types, with maximum values reached in alluvial and wet meadows.
- semi-natural grasslands can support 1.3–1.6 livestock units per hectare of grassland habitat, while pastures and meadows support on average 0.75 livestock units per hectare of land. Pastures and managed grasslands can hypothetically support 526 thousand milk cows. Semi-natural grasslands have a capacity to support 416 thousands of milk-cows.
- semi-natural grasslands with conserved numbers of original species can serve as a barrier to invasion. The invasion regulation function is a combination of a low proportion of invasive species in a habitat and the low invasibility of a habitat. Semi-natural grasslands (dry, wet and saline) or forest fringes have low levels of invasion despite relatively high invasion pressure.
- highest value of ecosystem services is reached in seasonally wet and wet grasslands, followed by alluvial meadows. The dominant component of ecosystem services is water flow regulation, followed by livestock provision and erosion regulation.

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A. The Pannonian Biogeographical Region

The Pannonian Region is dominated by a large flat alluvial basin, divided from north to south by two major rivers – the Danube and Tisza – and almost completely enclosed by the Carpathians, the Alps and the Dinarics. This sheltered position has a significant impact on the climate. Wet weather from the west is tempered by drier warmer winds rising up from the Mediterranean and cooler temperatures coming from the Carpathians and Alps nearby. The Pannonian Region includes all of Hungary, parts of Slovakia, the Czech Republic (the White Carpathians area) and Romania, stretching out of the EU into Serbia, Croatia and the Ukraine (see Figure 20).

With its many diverse and contrasting habitats (such as inland sand dunes, sand steppes, loess grasslands and maple-oak loess forests), this region has a particularly rich biodiversity, with many endemic species. Despite covering just 3 % of the EU territory, it harbours 118 species of animals and 46 species of plants listed in the Habitats Directive, as well as around 70 birds strictly protected in the Birds Directive. For thousands of years, the Pannonian Region has been heavily influenced by human activity. Today over 60 % of the land has been converted to arable lands. At first, grazing and farming was conducted in a relatively sustainable manner. However, large-scale drainage and land reclamation schemes launched in the late 19th century have resulted in the destruction of many semi-natural and natural habitats. Substantial areas have been fragmented and drained to make way for arable crops and fast growing non-native trees. The hills that encircle the flat plains exert a major influence on species dispersal and migration. Species are more vulnerable due to their restricted distribution. Many have evolved into species unique to the region. Above all, the region is of major importance for birds (EC, 2009a).

A.1. White Carpathian region

The White Carpathians Area (Bílé Karpaty) is located on the border of the Czech and Slovak Republics and lies in the regions of Zlin and South Moravia. Thanks to their exceptionally rich nature and culture, the region was declared a PLA, and the PLA territory was included on the list of UNESCO Biosphere Reserves. The PLA covers a territory of 715 km². The White Carpathians region is especially valuable because of the unusually wide variety of biotopes and species found on its territory. Vegetation communities are found here such as thermophilous oak forests, Carpathian and Pannonian oak–hornbeam forests, primeval mountain beech forests and most of the types of meadow and forest wetlands and meadow biotopes in Europe. The area is a study ground of worldwide importance. The herb-rich meadows of White Carpathians are among the

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most valuable territories, with the highest species diversity and the most orchids in central Europe. This natural value was partly a consequence of human activity, as a result of specific farming methods. The White Carpathians is a territory that serves as a model for the co-existence of nature protection interests and economic land use, which respect the natural conditions and ecological sustainability (www. bilekarpaty.ochranaprirody.cz).

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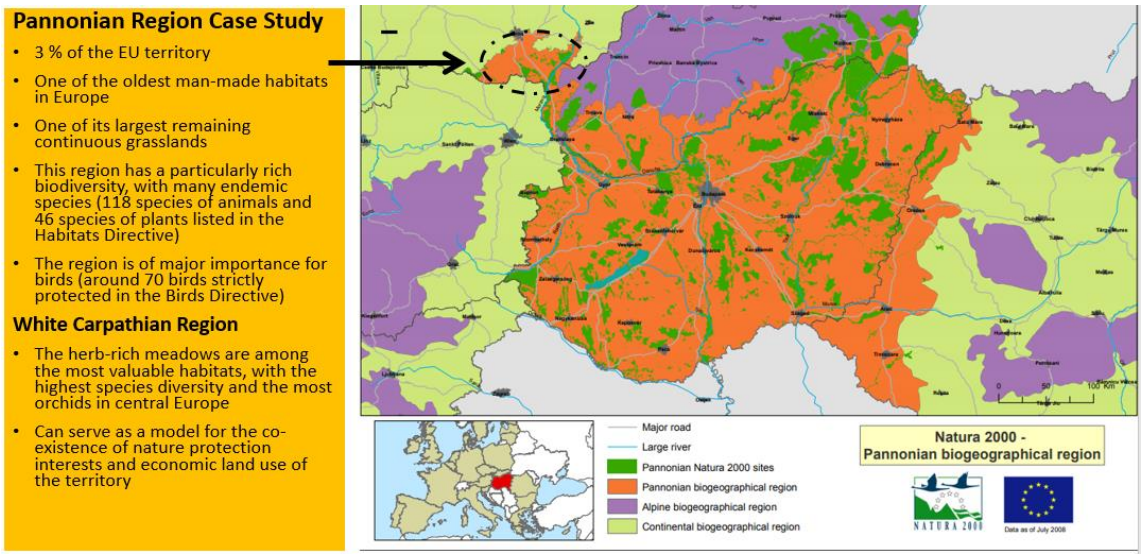
Figure 20. Description of Pannonian biogeographical regions case of study.



Source: EC (2009), modified

B. The Continental Biogeographical Region

The Continental Region covers over a quarter of the European Union, stretching from central France to the eastern edge of Poland (**Figure 21**). It includes all or part of the territory of 11 EU countries. It has specific regional features such as a relatively flat landscape and a climate of pronounced contrasts. The landscape is generally flat in the north and hillier in the south, except for the extensive floodplains in the Poland Danube basins. The Continental region is rich in biodiversity. At the crossroads of so many different biogeographical zones, it shares many species with them. It harbours 149 animal species and 83 rare plant species listed in the Habitats Directive, as well as over a third of the birds listed in Annex I of the Birds Directive. The characteristic beech, oak and hornbeam forests are home to many typical bird species. The semi-natural grasslands and meadows attract species like the corncrake or white stork, which depend on extensive farming systems for their survival. The grasslands and wet meadows are also particularly rich in plant species and include such rare plants as the Bohemian bellflower (*Campanula bohemica*), or the gentian (*Gentianella germanica*) (EC, 2009b).

The Continental region was once covered in lowland deciduous beech forests, extensive floodplains, marshland and bogs. However, much of the forest has been cleared for fuel and timber and replaced by large-scale agricultural production. The transformation is so great that this area is now often referred to as the 'bread basket' of Europe. The rivers have also played a major economic role over the years connecting the north and the south through internal

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waterways. Most have been canalised and regulated, leading to a dramatic loss of floodplain habitats and species. Population levels are mostly high, especially in the northern urban areas of Germany, Denmark and Poland. Central Europe was for many years the industrial heartland of Europe and whole areas are dominated by large industrial zones. Similar areas exist further east, in eastern Germany, Poland and the Czech Republic. Open cast mining, copper extraction, burning of brown coal (lignite) etc… all produce large quantities of noxious by-products. Known as the black triangle, this area suffers from massive industrial pollution and remains to this day the most polluted area of Europe (EC, 2009b)

B.1. Bohemian-Moravian Highlands (Vysocina region)

The region is situated in the very heart of the Czech Republic. The name of the Vysocina Region derives from the name of the Ceskomoravska vrchovina (Bohemian-Moravian Highlands), a hilly, undulating countryside situated between the two historical lands of the Czech Republic. Bohemian-Moravian Highlands reaches over 800 metres in altitude, in the two distinct mountain ranges of Zdarske vrchy in the north of the region and Jihlavske vrchy in the south-west. The main European water divide, echoing the former frontier between Bohemia and Moravia, divides the region into two parts almost equal in area. With mean annual temperatures of 5-7 degrees centigrade, Bohemian-Moravian Highlands is one of the colder regions of the Czech Republic. The original virgin forest was transformed by human activity into an undulating cultivated steppe, with low hills and valleys and a wealth of woods and groves. The many streams form a number of ponds, which fulfil functions from economic to recreational to landscaping. The history of the region has, to a great extent, been influenced by natural conditions. Botanically rich and diverse Bohemian-Moravian Highlands region is the home of many precious plants, such as drosea and plants from the orchid family. The Mohelno Serpentine Steppe lies near Třebíč – our largest prairie with typical flora and fauna. Its natural uniqueness is at least of Central-European importance. Permanent grasslands make up less than one fifth of the area of agricultural land in the region. Especially in the highest areas of the Bohemian-Moravian Highlands, pastoral cattle breeding has spread more recently (www.kr-vysocina.cz).

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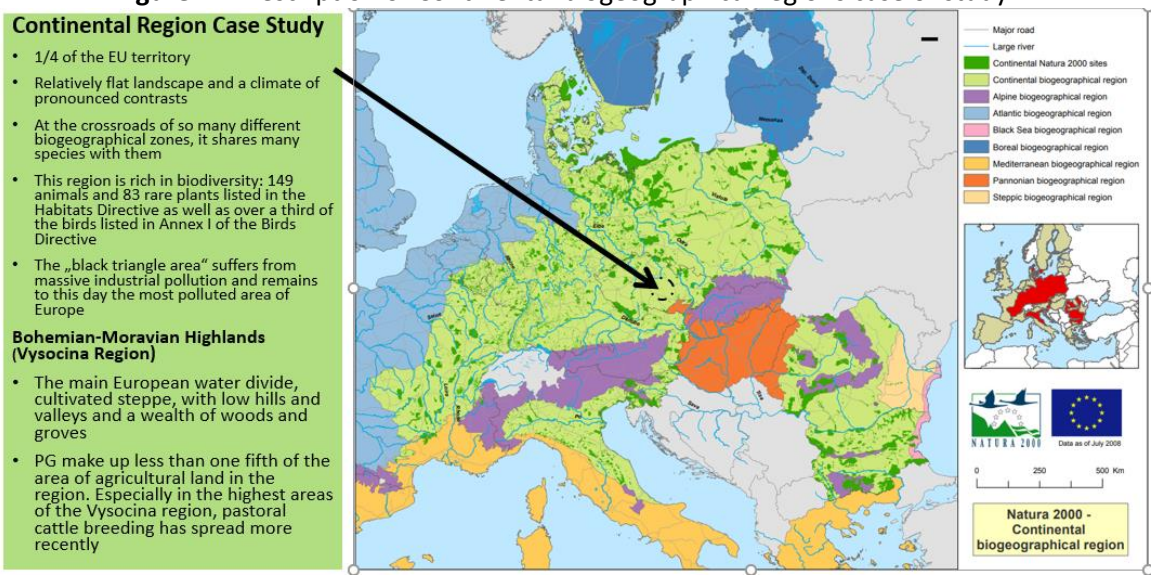
Figure 21. Description of Continental biogeographical regions case of study.



4.2.1.4 Key challenges and threats for the PG management

Societal driving forces have been the major influential factors in the past two centuries in respect to land use and land cover change in the Czech Republic. The social and political changes since 1989 quite quickly allowed reestablishment of functioning market mechanisms and represented a milestone in the development of (not only) the agricultural landscape. The main threat for Czech agriculture is the loss of agricultural land (mainly arable – see Figure 22). Kabrda (2008) summarises the causes:

- Suburbanisation – growth of built-up areas by 7 thousand ha (Czech Statistical Office, 2018).
- Reforestation – increase in the forested areas by 33 thousand ha (Czech Statistical Office, 2018).
- Land abandonment – abandoned agricultural land about 300 thousand ha was estimated in 2000 (Kabrda, 2008), now most of agricultural land is cultivated due to subsidy payments.

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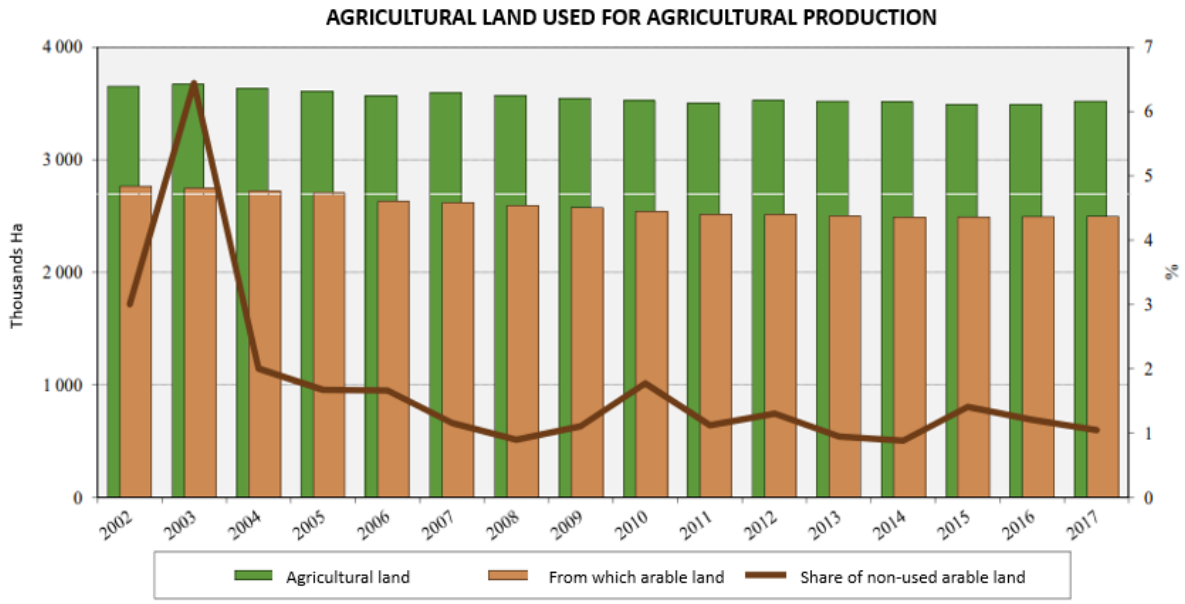
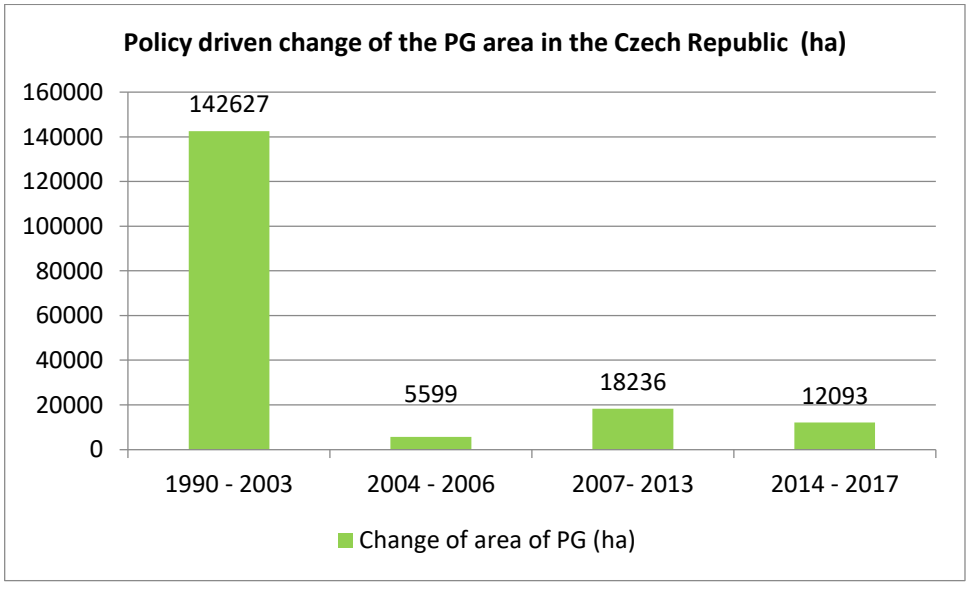
Figure 22. Development of agricultural land area used for agricultural production.



Source: Czech Statistical Office (2018)

Figure 23 illustrates the decline of the area of PG in the period 1990 – 2017 as a consequence of socio-political changes described in section 4.4.1.2 B.

Figure 23. Policy driven changes of PG area in the period 1990 - 2017.



Source: Czech Statistical Office (2018) data, calculated

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A. Decreasing production (provision function)

In the last decade of the 20th century, there was a great reduction in livestock numbers and consequently a significant reduction in the intensity of grassland management in the Czech Republic. There are two other factors affecting yields, particularly water availability (rainfall) and fertiliser application. In western Bohemia, yields were high even in high altitudes, due to a wetter climate with sufficient rains. By contrast, in other areas such as South Moravia the climate is dry, and yields are rather poor. In 2011, Institute of Agricultural Economics and Information (IAEI) carried out an extensive survey of grassland management practices with a focus on fertiliser applications (Pražan et al., 2011). Five hundred and eighty eight grassland farmers were interviewed. The research found that the intensity of input use had been declining significantly since the beginning of the 1990s. The application of nitrogen (N) did not exceed 30 kg N per hectare on average in 2008-2011; corresponding yields were substantially below (by 20% or more) their potential. The survey also disclosed relatively little difference in application of fertilisers between farms within and outside agri-environment schemes. Yields also declined with altitude (Figure 24). In western Bohemia, yields were high even in high altitudes, due to the wetter climate. In contrast, the climate is dry and yields were rather poor in the east Moravian mountains. In recent years, the reverse situation has often been the case due to drought in the lowlands.

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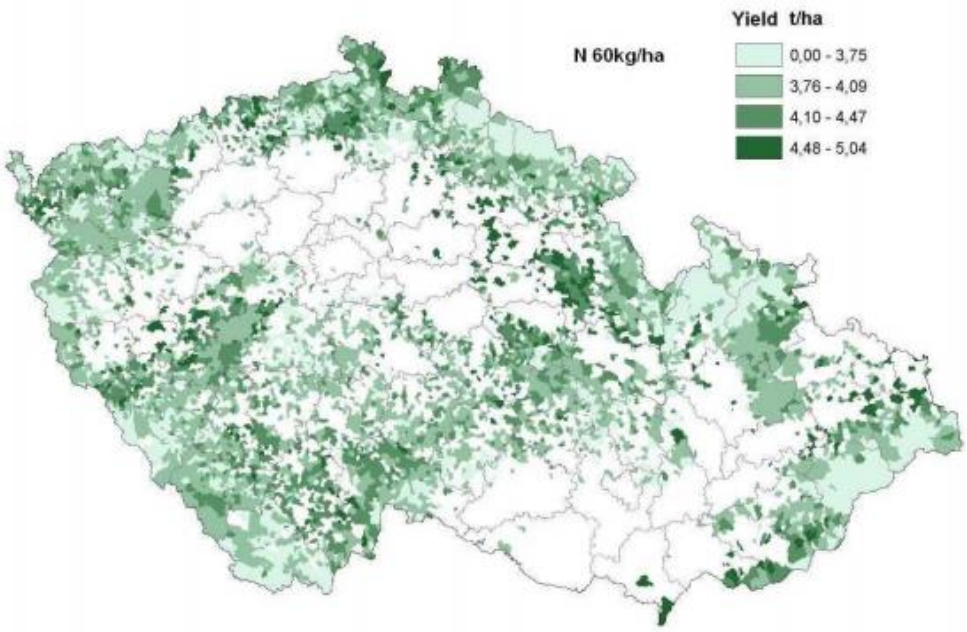
Figure 24. Distribution of grass yields (in ha equivalent).



Notes: yields are displayed only for cadastres with more than 20% of grasslands.

Source: Voltr (2011), Ratinger et al. (2011)

One of the main threats to grassland productivity is that grasslands have been managed mainly using agri-environmental measures. Without subsidies, a large part of the acreage of grassland could be abandoned used extensively (mainly on the border in mountain and foothill areas). In the absence of farming, invasion of undesirable plant species can represent a threat to PG ecosystem services (Hönigová et al., 2012)

B. Environmental and climate needs and problems identified (decreasing regulation and supporting functions)

Based on recent trends in environmental indicators in the Czech Republic, the following challenges for PG management have been identified in Evaluation study of the payment for agricultural practices beneficial for climate and the environment (EC, 2017) were identified by the Czech experts.

B.1. Protection and enhancement of biodiversity

- Reverse the decline in abundance and distribution of common farmland birds.
- Reverse declines in farmland biodiversity.

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- Address the unfavourable Conservation Status of grasslands.
- Address the Condition of protected areas (flexible PG management conditions reflecting environmental and climate needs and changes).

B.2. Protect and improve soils (restricted/rejected renovation and bad management)

- Soil erosion by water
- Soil organic matter

B.3. Protect and improve water quality

- Nitrate pollution of surface water (areas favourable for agricultural production).
- Phosphate pollution of surface water.
- Pesticide pollution of water.

B.4. Climate change mitigation: Encourage carbon sequestration by plants and soil

B.5. Climate change adaptation

- Natural flood management.
- Conservation of water resources.

4.2.1.5 Identifying policies relevant to permanent grassland

4.2.1.5.1 Data collection

The survey was carried out by interviewing the target group of Czech stakeholders identified during the Delphi method. Identified stakeholders in Delphi survey represents groups who are directly or indirectly affected by the EU PG Policies, as well as those who may have interests in a PG management and/or the ability to influence its outcome, either positively or negatively. The data collection was organised in following steps:

- **Initial desk research**: identification of national policies relevant to PG at national level based internet research by recommended snowballing technique (Data sources: relevant official policy documents and web pages, position papers, stakeholders' statements).
- **Delphi consultations:** confirmation of relevance and importance identified national PG policies:
  - Discussion with PG farmers during the seminar organized by MENDELU (10 farmers).
  - Consultation with SUPER-*G* partners (four partners).

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- **Blue Ribbon Panel of experts' assessment:** selection of the most important PG related policies – expert group stakeholder's representation (n = 9):
  - Academic and researchers (n = 4).
  - National Government (n = 2: Nature and Landscape Protection Agency, Ministry of agriculture).
  - Regional government (n = 1).
  - Farmers interest groups (n = 2).

4.2.1.5.2 Policy mapping

As a result of the policy document analysis and independent consultations with the permanent stakeholder group and Delphi survey, European and national policies intended to enhance PG management and to protect and to support provision of ES by PGs have been identified. The content of these policies has been analysed with secondary information sources using the "policy analysis table" (PAT). National PAT Results summary in Table 9 describes the main national-level, formal policies and policy instruments intended to protect or benefit Czech PGs.

For policy mapping, the SUPER-*G* Codebook classification of policy instruments was used. Sticks represents regulations (normative instrument of command and control), carrots represent economic incentives (subsidies) and sermons are based on provision of information (mainly strategic frameworks). The Czech PAT was structured into three policy areas that correspond to the mixed governance structure and competencies:

- Agricultural policy (The Ministry of Agriculture).
- Environmental policy (The Ministry of the Environment).
- Regional development policy (The Ministry of Regional Development).

Based on the analysis of Czech national policies affecting TTP management, the following results can be summarized as follows:

- Six main policies and 12 most important instruments affecting PG management have been identified. Of these, agricultural policies are more relevant to PG. The expert group evaluated the CAP as the policy with the most significant influence on PG management and ES in the Czech Republic.

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- CAP policy measures supporting the basic management of meadows/pastures are offered as a mixed instrument – “carrot with sticks” (payment per ha of eligible agricultural land incentive with regulation implemented via cross compliance, limits imposed on fertiliser and herbicide application, grazing and grassland restoration and mulching, as well as restrictions on dates for mowing or minimum livestock units.

  - All 12 analysed instruments apply at a national scale, of which nine instruments included in the analysis were voluntary (economic incentive), one was mandatory and the last two were informative (strategic).

  - Direct payments and other subsidies listed in the PAT are "conditional" fulfilment of the conditions keeping the land in good agricultural and environmental condition (GAEC), compliance with the statutory management requirements in the area of environment, climate change, public health, animal and plant health and animal welfare.

  - Agri-environmental programmes are designed to support PG management with respect to the Nitrates, Natura 2000 (Birds, Habitats), Water and Biodiversity Directives. Measures are targeted at specific habitats, protected areas and ANC/LFA areas.

    - A higher premium is paid for mesophilic/hygrophilic and mountainous/xerophilous meadows, with strict limits on fertiliser use.

    - Another measure is explicitly directed at the maintenance of species-rich pastures (without additional fertiliser).

    - Additional measures provide support specifically for bird habitats on grassland.

  - Secondary information on the policy impact evaluation was scarce.

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Table 9. National PAT results summary (Czech Republic).

Policy	Policy instrument	Objective	Type of instrument	Ecosystem services provision
CAP Pillar I **(regulation via cross compliance - Agricultural act -Nitrate directive, Environmental protection - Climate strategy)**	Basic payment	To guarantee a minimum income to farmers	Carrot with stick (Payment per ha of eligible agricultural land incentive combined with regulatory instrument (cross compliance) The Act on Agriculture	Provision ES: grass, animal production Regulating ES protection via cross-compliance Cultural - agricultural landscape heritage
	Greening	To compensate the cost of environmental services of agro-ecosystems – biodiversity and climate	Carrot with stick (Subsidy Incentive combined with compliance regulatory instrument - additional conditions) the Act on Agriculture Environmental legislation (Cross Compliance)	Regulating: climate regulation, water purification and regulation Supporting: diversity protection, habitats Cultural: aesthetic, recreation
	Additional national payment (Top-Up - BTPM Cow Payment, Sheep and Goat support)	To support sectors and regions which are facing difficulties and are very important from an economic, social or environmental point of view	Carrot with stick (Subsidy Incentive combined with regulatory instrument) The Act on Agriculture	Provision ES (livestock production) Supporting ES: diversity protection, habitats Cultural ES: aesthetic, recreation

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Policy	Policy instrument	Objective	Type of instrument	Ecosystem services provision
CAP Pillar II (regulation - cross compliance - Natura 2000, Habitat and Bird directives, Environmental protection)	M10. Agro-environmental and climate measures (Grassland management, Measures targeted at specific habitats or protected areas, Grassing over arable land)	To promote land use patterns that are consistent with the protection and improvement of the environment, the landscape and their characteristics. The measure supports the conservation of high-nature-value, natural resources, biodiversity and landscape maintenance: Grassland care sub-measures are focused on the maintenance of valuable habitats on PG, with a sub-measure related to grassing of arable land, with the aim of preventing soil erosion, sub-measure bio-tapes serving to promoting the biodiversity of birds, small vertebrates and pollinators in the agricultural landscape, and the sub-measure protection of the lapwing in order to protect the breeding grounds of this species and other bird species nesting in the agricultural landscape.	Carrot (voluntary subsidies) with sticks (five-year commitments compliance with the cross compliance and other conditions of measure) The Act on Environmental Protection	Provision ES: genetic resources; biomass production Regulating services: preventing soil erosions biodiversity conservation Supporting services: reduced risk of erosion, water retention; soil fertility, biodiversity maintenance, valuable habitats Cultural: landscape maintenance - aesthetic, recreation, heritage
	M11. Organic Agriculture	To promote environmentally friendly farming systems - to enhance soil degradation prevention, to conserve and restore valuable habitats on agricultural land in terms of species diversity and to enhance the ecological stability and aesthetic value of the landscape.	Carrot (voluntary subsidies) with sticks (cross compliance) The Act on Agriculture The Act on organic farming, cross compliance requirements.	Provision ES: organic grass and livestock production Regulating ES: preventing soil degradation, biodiversity conservation, pollination Supporting services: reduced risk of soil degradation, enhanced ecological stability, water retention; soil fertility, biodiversity maintenance, valuable habitats Cultural ES: landscape maintenance – aesthetic value, recreation, heritage
	M12. Natura 2000 (Natura 2000 and Water Framework	To support the sustainable use of agricultural land, contribute to the maintenance of the rural landscape and	Carrot (voluntary subsidies) with sticks (cross compliance)	Provisioning ES: sustainable agricultural production

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Policy	Policy instrument	Objective	Type of instrument	Ecosystem services provision
	Directive payments)	the maintenance and promotion of sustainable farming systems	The Act on environment, Birds and Habitats directives	Regulating ES: preventing soil degradation, biodiversity conservation Supporting ES: biodiversity maintenance, valuable habitats enhanced ecological stability, water retention; soil fertility Cultural ES: landscape maintenance – aesthetic value, recreation, heritage
	M13. ANC/LFA (Payments to facing natural or other specific constraints (ANCs))	To encourage the sustainable use of agricultural land, contribute to the maintenance of the rural landscape and the maintenance and promotion of sustainable farming systems by compensation for additional costs and income foregone in connection with the reduction of agricultural production	Carrot (voluntary subsidies) with sticks (cross compliance) The Act on Agriculture European Commission-defined restrictions (so-called biophysical criteria) min. LUs	Provisioning ES: maintenance of grass and livestock production Regulating ES: preventing soil degradation, transformation function Supporting ES: biodiversity maintenance, valuable habitats enhanced ecological stability, water retention; soil fertility Cultural ES: landscape maintenance – aesthetic value, recreation, heritage
Environmental policy	Landscape protection and restoration programme	To support non-investment activities in the field of landscape protection against erosion, maintaining the cultural condition of the landscape and supporting species diversity	Carrot (voluntary subsidies) combined with requirements of Act no. 114/1992 Coll. on Nature and Landscape Protection - management of protected areas must be carried out according to the zones of graded protection	Provisioning ES: environmentally sensitive production Regulating ES: preventing soil erosion/degradation Supporting ES: species diversity - biodiversity maintenance, valuable habitats enhanced ecological stability, water retention; Cultural ES: landscape maintenance – aesthetic value, heritage, recreation

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Policy	Policy instrument	Objective	Type of instrument	Ecosystem services provision
	Strategy for Adaptation to Climate Change in the Czech Republic 2015	To promote the establishment of grassland and afforestation in areas vulnerable to soil erosion and degradation, in the case of grassing also in nitrate sensitive areas and along water bodies or in buffer zones of water resources	Sermon (information) In addition to the existing instruments, **payments for ES** are proposed as a potential economic instrument, but the possible future introduction of these is conditional on the existence of a functioning national ES evaluation system carried out in accordance with a single approach at least at European level	Complex landscape ES: Preserve and improve the natural resistance and resilience of natural and man-made parts of the landscape, thereby preserving their ability to provide the essential ecological functions necessary for the provision of ES. Regulating ES: Increase the carbon-binding capacity of ecosystems both by reducing inappropriate conversion of habitats and ecosystems and by preserving and restoring natural habitats with a high carbon content, biodiversity
	National Action Plan for Renewable Energy	To meet the set targets in the area of the use of energy from renewable sources o	Sermon (information) Measures for the Promotion of the Use of Energy from Biomass	Provisioning ES: biomass Regulating ES: preventing soil degradation, transformation function Supporting ES: carbon cycle, sustainable energy flows
Regional development policy	OP Environment	To protect and ensure quality living environment for the population of the Czech Republic, to support resource efficiency, eliminate negative impacts of human activities on the environment and to mitigate climate change impacts. Priority 4: Preservation and care of nature and landscape	Carrot (Incentive)	Provisioning ES: environmentally sensitive production Regulating ES: natural functions of landscape Supporting ES: species diversity - biodiversity maintenance, valuable

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Policy	Policy instrument	Objective	Type of instrument	Ecosystem services provision
		4.1 - Ensure the favourable status of the subject of protection of nationally protected areas 4.2 - Strengthen biodiversity 4.3 - Strengthen the natural functions of the landscape		habitats enhanced ecological stability, water retention; Cultural ES: nature and landscape maintenance
	Land consolidation is governed by Act No. 139/2002 Coll. of 21 March 2002	When processing land consolidations, it determines land use. Land modifications are changes in the legal status of lands in which land is "spatially and functionally" arranged in the public interest, merged or divided, ensuring accessibility and use of land and the alignment of its borders, to create conditions for the rational management of landowners.	Stick (regulation)	Complex landscape ES: conditions for improving environment, protection and land resources reclamation, water management and improving the ecological stability of the landscape. Regulating ES: water-management, anti-erosion, ecological and landscaping measures

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4.2.1.5.3 Policy logic

To illustrate the policy logic, the Cascade Framework was applied. As illustrated in Figure 25 and Figure 26, the majority of policy instruments of the Czech policy mix aims to influence PGs positively by the support of maintaining grasslands themselves within farmlands, or as part of the mosaic of land uses in the area (delivery channel 1 in the Cascade Framework).

Delphi consultations with representatives of PG farmers and with expert group of SUPER-*G* partners revealed that agricultural policy instruments have the greatest influence on the way PG is managed and the level of cultural service delivery within Czech Republic PG landscapes. In particular, policy instruments from Pillar II of the CAP could be viewed as a quasi-market for ecosystem services, referring to a centralised demand for public goods represented by the government, in which they pay for public goods. Decentralised social demand from the Czech population is represented by government requirements and definition of Agri-environmental programmes (delivery channel 2 in the Cascade Framework). Policy document analysis revealed that some market-led solutions (delivery channel 3 in the Cascade Framework) have emerged in informative instruments (strategies), but it will take a few years to fill the gap between intentions and practical realization.

All policy instruments analysed have been addressed to farmers or other land managers (e.g. PG in state or communal property). More detailed characteristics of the instruments with the highest impact on PG management and ES, and political logic, are given below.

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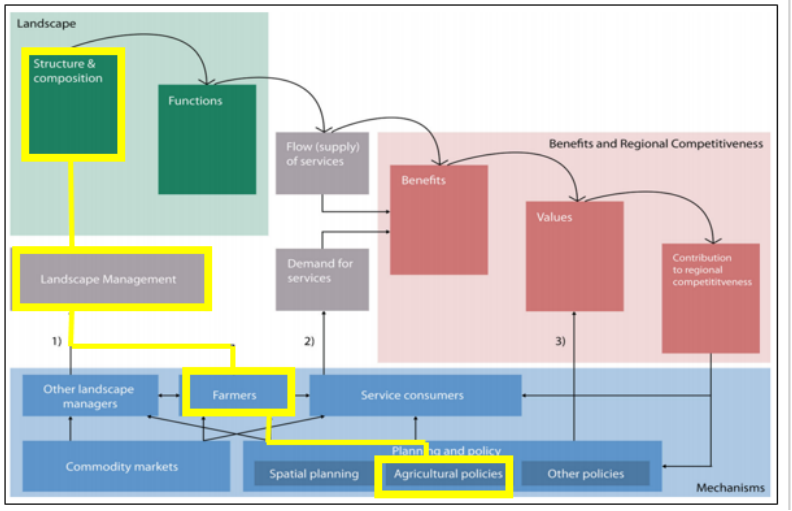
A. Common agricultural policy - Pillar I SAPS (Single Area Payment Scheme) - single direct area payment and additional national payments.

Figure 25. Diagram of policy logic for CAP Pillar I in Czech Republic.

Policy	Policy instrument
CAP Pillar I (regulation via cross compliance - Agricultural act - Nitrate directive, Environmental protection - Climate strategy)	**Basic payment**
	Greening
	Additional national payment (Top-Up - BTPM Cow Payment, Sheep and Goat support)
the Act on Agriculture, Nitrate directive, EU Climate strategy	



Direct payments have been granted to farmers since the Czech Republic joined the EU in 2004.Several fundamental changes have been made to the CAP, with the latest reform of 2013 significantly changing the structure of direct payments for the 2015-2020 period. The objectives of the reformed CAP under direct payments include a greater emphasis on environmentally friendly access through support for greening or generational change in rural areas supported by the granting of a contribution to young farmers. Direct payments account for the largest share of subsidies paid for agricultural subsidies. The current CAP contains a number of new elements. In 2017, these included the active farmer criterion.

Since 2015, direct payments have been composed of several parts. The largest component is the so-called basic payment and in the Czech Republic it will continue to be the single area payment for agricultural land (SAPS) until 2020. The other components are the greening payment - climate friendly and environmentally friendly agricultural practices (greening), voluntary support coupled to sensitive sectors and payment to young farmers. Until 2020, the Czech Republic may also pay **national support (PVP) from the national budget,** which is linked to the previously provided top-up payments. Payment for agricultural land - the applicant may obtain this subsidy title only on condition that it manages agricultural land with an area of at least 1 ha, which is maintained as eligible agricultural land in the LPIS (Land Use Record):

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- Payment for ruminants - payment may be requested by a person who, as of 31 March, kept ruminants on a holding registered in the central register in quantities of at least 2 livestock units (LU). Rams and goats are not included in LU numbers. Ruminants do not include horses, donkeys or their hybrids.

- Payment for sheep breeding or goat breeding - the payment can be used by a person keeping sheep or goats in a holding registered in LPIS. Payment is granted for such animals kept for at least 1 to 31 December in quantities of at least 2 LU, with rams and goats not included in LU numbers.

- Dairy Cow Payment can be claimed by a person keeping cows with the exception of breeds listed in the guide to additional payment applications. The subsidy shall be granted for cows kept for at least from December 2 to 31, for at least 2 LU.

- Beef cattle Payment can be claimed by a person keeping cattle with the exception of breeds listed in the guide to additional payment applications. The subsidy shall be granted for calves born during the period from 1 April of the year preceding the application until 31 March of the calendar year concerned from December 2 to 31, with payment on at least 1 calf (0.4 LU).

A major innovation in Pillar 1 of the CAP was the introduction of payments to farmers for carrying out a compulsory set of 'greening measures'. Member States are required to allocate 30% of the direct payments budget to grant an annual payment for compulsory 'agricultural practices beneficial for the climate and the environment', otherwise known as 'green direct payments' or 'greening measures'.

The green payment is granted as a flat-rate payment per eligible hectare declared under the Single Area Payment Scheme (SAPS) in the Czech Republic. There are three practices identified that can be used to fulfil this requirement:

- **Crop diversification** – the cultivation of a minimum of two or three crops on arable land above a certain size limit (to improve soil quality primarily);

- **Maintenance of permanent grassland** – comprising two elements: i) to maintain the level of permanent grassland at 95% of its area as a proportion of total agricultural area; and ii) to protect the most environmentally sensitive permanent grasslands from ploughing (to preserve soil carbon, support species and habitats of biodiversity value, protect against soil erosion and protect soil quality); and

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Ecological Focus Area (EFA) – to manage at least 5% of the arable land of farms with more than 15 hectares of arable land as an EFA, comprising a combination of management practices or landscape features as set out in the regulation and applied by Member States (to safeguard and improve biodiversity on farms primarily).

Specific conditions for the provision of direct payments are regulated by Government Regulation No. 50/2015 Coll. A No. 112/2008 Coll. To enter the subsidy title, it is necessary to manage at least 1 ha of agricultural land and according to the principles of good agricultural practice.

Calculation of the rate of payment per 1 ha of agricultural land - The Fund shall publish the rate no later than 30 November on its website www.szif.cz and in one national daily newspaper.

Amount of aid = rate per 1 ha of agricultural land (in CZK) x eligible area of agricultural land (in ha) (SAIF, 2013).

The condition includes maintaining the ratio of permanent grassland to agricultural area and a total ban on changing the permanent grassland in Environmentally Sensitive Areas (ESAs). The ratio must not decrease by more than 5% in the whole Czech Republic compared to the reference ratio. Not only ploughing (i.e. change from T culture to R culture) is considered to be a change of PG, but any change of PG from one culture to another. The only permitted exception here is the change of PG to Forest (it does not include Short Rotation Coppice planting in young plantations for energy production or the planting of Christmas trees).

Greening measures are intended to work in conjunction with cross compliance and key rural development measures. In the 2014-2020 financial period, changes to the conditions were introduced, with some of the previous requirements moving to different parts of the CAP, particularly the greening provisions (for example the rules on the maintenance of PG and certain aspects of the soil requirements within the EFA measure).

B. Common agricultural policy - Pillar II – Rural Development Program (RDP)

In addition to direct payments, under the RDP, farmers have the possibility to count LFA payments in less-favoured areas, which should, by encouraging the sustainable use of agricultural land, contribute to the preservation of the rural landscape and to the maintenance and promotion of sustainable farming systems.

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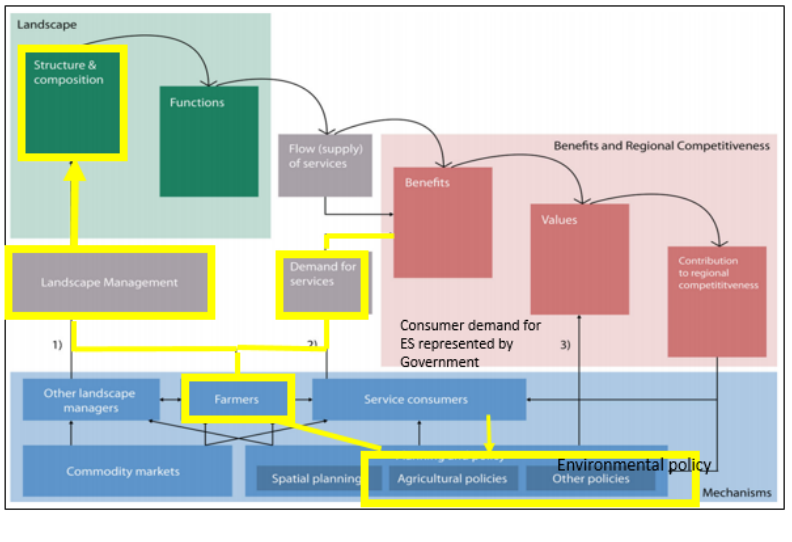
Figure 26. Diagram of policy logic for CAP Pillar II in Czech Republic.

Policy	Policy instrument
CAP Pillar II (regulation - cross compliance - Natura 2000, Habitat and Bird directives, Environmental protection)	**M10 Agro-environmental and climate measures (Grassland management, Measures targeted at specific habitats or protected areas, Grassing over arable land)**
	M11 Organic Agriculture
	M12 Natura 2000 (Natura 2000 and Water Framework Directive payments)
	M13 ANC/LFA (Payments to facing natural or other specific constraints (ANCs))
the Act on Agriculture, the Act on organic farming, Natura 2000, Habitat and Bird directives, Environmental protection	



- **Agri-environment-climate measure (AECM): It is** compulsory for all Member States to implement this, but it is voluntary for farmers. This measure provides *payments to farmers and other land managers to encourage the uptake or continuation of environmentally and climate beneficial practices* on their farms. Agri-environmental schemes aim to address, in particular, natural landscape management based on livestock farming, water retention in the landscape and reduction of soil erosion, promotion of ecological stability of the landscape, and preservation and enhancement of biodiversity on agricultural land. The minimum areas for enrolment are the same as for the LFA.

  The measure in the new programming period (2014 – 2020) supports 'environmentally friendly' nutrient management and plant protection products, regulates soil agro-technical operations and crop structure for the benefit of the environment. Grassland management is targeted both in the open countryside and in the area of specially protected areas, national park protection zones, Natura 2000, and on defined areas with valuable habitats outside the above-mentioned areas. Arable reversion to grassland such as areas at risk of erosion, water protection zones, nitrate vulnerable zones or specially protected areas is included as well.

- **Sub-measure: Grassland treatment** aims at the sustainable management of valuable habitats on grasslands. This sub-measure is divided into a basic subsidy title, targeted at grassland maintenance in the open countryside, and so-called 'superstructure titles', aimed at maintaining valuable habitats on grasslands in specially protected areas and Natura 2000 areas with a PG culture, and is subject to compliance with the minimum and maximum levels of livestock rearing on a daily basis

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from 1 June to 30 September each year of the commitment. The applicant is obliged to adhere to the stipulated method of grassland management. In specially protected areas and areas of the Natura 2000 network, the appropriate management method is specified by nature conservation authorities through the definition of a specific title on a given part of the land block.

The amount of the subsidy for **organic farming is** determined by the Government Decree No. 76/2015 Coll., as amended, divided into the rate for the transitional period and the rate within the own organic production and its amount is determined according to the cultivated crop and culture:

- EUR 83 / ha for grassland management (EUR 84 / ha under the transitional period), Deduction - 32 €/ha in I. zone of NP or ESA (to avoid double payment).
- EUR 69 / ha for arable grassland management (EUR 79 / ha under the transitional regime) period)

From 2015 to 2020, a new support system for organic farming is valid, as defined by Regulation (EC) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repeal of Council Regulation (EC) No 1698/2005.

- **LFA (Less Favoured Areas) and Natura 2000** - Given that most grasslands lie in areas less suitable for agricultural production (compared to fertile lowlands) or in areas of various constraints, these subsidies aim to balance economic conditions across all areas. If this were not the case, farming in many areas and the depopulation of the rural sector and land abandonment would most likely occur (Mládek et al., 2006). To be eligible for this subsidy, the farmer undertakes to farm the land for at least 5 years. The applicant must manage farmland with grassland culture in LFA or Natura 2000 areas on a minimum area of 1 ha (SZIF, 2013).

  Support for areas with natural and other specific handicaps was established based on Articles 31 and 32 of Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005.

  The LFA payment was granted only for grasslands managed in the following areas:

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- Mountain areas (type HA and HB),
- Other less-favoured areas (OA and OB areas),
- Areas with specific restrictions (type S area).

In 2015-2017, the definition criteria remained the same as those defined in the RDP 2007-2013. However, several changes have occurred since 2015 in relation to the new RDP 2014-2020. The size of the demarcated areas has not changed. New rates have been set for each area. At the same time, there was a change in the differentiation of payments in mountain areas. Since 2015, there are five sub-regions in mountain areas compared to the original two.

In 2015–2017, LFAs were designated pursuant to Government Regulation No. 72/2015 Coll., on the conditions for providing payments for areas with natural or other special restrictions (ANC).

The ANC measure compensates farmers for all or part of the additional costs and income foregone related to the constraints for agricultural production in the area concerned. Criteria for the identification of areas with natural and other specific handicaps.

- **Mountain ANC -** municipalities or cadastres with an average altitude of over 600 m a.s.l. or 500 to 600 m above sea level and at the same time with a slope of more than 15% in an area of more than 50% of the total land area in the municipality or cadastral area.

  Mountain ANCs are further differentiated into five subcategories (**H1 to H5)** according to production limitations related to altitude and slope.

- **Other ANC** - the definition of ANC-O proceeds in two steps. In step 1, it is assessed whether at least 60% of the agricultural land of the municipality is disadvantaged by any of the following criteria: low temperature, dryness, limited soil drainage, unfavourable structure and skeletonity, shallow soils, poor soil chemical properties and steep slope (slope above 7 ° (slope 12.3%) in the area of more than 50% of the agricultural land area of municipalities and cadastral territory.

- In step 2, municipalities that overcome their disadvantage in the form of investment measures (drainage systems) or favourable value of normative soil productivity (more than 80% of the Czech Republic average without mountain areas) are excluded. Municipalities with an average soil yield lower than

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The other ANCs are further subdivided into three sub-categories (**O1 to O3**), taking into account the natural handicap defined by the criteria used in step 1 in a particular cadastral territory. The differentiation has taken into account that the possible occurrence of two or more disadvantageous criteria on a single plot may lead to increased land management costs.

- **Specific Areas with Natural Constraints ANC** - municipalities and cadastral areas that are not included in the ANC or other ANC areas and which have a yield of agricultural land less than 80% of the CR average of mountain areas or - with an average soil yield of less than 90% of the Czech Republic's average without mountain areas and slope above 7 ° (slope 12.3%) in the area of more than 50% of the agricultural land area of municipalities and cadastral territory.

  Specific areas are not further distinguished.

Since 2018, the level of payments has been newly established in all areas of ANC. Farms are now differentiated according to livestock intensity (cattle, sheep, goats and horses) into two types of farms. The ANC payments are digressive, which means that the payment is gradually reduced depending on the area of eligible agricultural land in the ANC declared by the undertaking.

The following thresholds and percentages of reduction are set:

- Area of agricultural land up to 300 ha - full payment.
- Area of agricultural land over 300 ha and up to 500 ha - payment reduced by 10%.
- Area of agricultural land over 500 ha and up to 900 ha - payment reduced by 18%.
- Area of agricultural land over 900 ha and up to 1,800 ha - payment reduced by 22%.
- Area of agricultural land over 1,800 ha and up to 2,500 ha - payment reduced by 27%.
- Area of agricultural land over 2,500 ha - payment reduced by 30%.

When counting hectares and determining the rate of reduction of payments, the individual types of ANC are ranked from highest rate to lowest.

- **Natura 2000 payments**, which are in line with the Water Framework Directive (WFD), aims to help farmers address the various disadvantages resulting from the implementation of the European Natura 2000 Directives, thus maintaining sustainable management in Natura 2000 areas or in stepping-up areas (areas related to Natura 2000 areas). These are very often valuable areas in terms of the conservation of species diversity, on which the use of intensive technologies, especially fertilization, is limited. At the same time, there are in some cases

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areas whose management is made difficult by natural conditions, usually resulting from the relief of the terrain, etc. In these areas, there is an increased risk of abandonment and subsequent degradation of the site.

The Natura 2000 payment shall be granted only for grassland located in:

- Bird areas (pursuant to Section 45e (2) of Act No. 114/1992 Coll., On Nature Protection, as amended) and at the same time in the 1st zone of national parks or the 1st zone of protected landscape areas, or

- Sites of Community importance included in the national list (pursuant to Section 45a (2) of Act No. 114/1992 Coll., as amended) and at the same time in the first zone of national parks or the first zone of protected landscape areas.

- **Organic farming measure**: which supports the conversion to or the maintenance of organic farming to encourage farmers to adopt or maintain environmentally friendly farm practices and high standards for animal welfare.

  The amount of the subsidy for **organic farming is** determined by the Government Decree No. 76/2015 Coll., as amended, divided into the rate for the transitional period and the rate within the own organic production and its amount is determined according to the cultivated crop and culture:

  - EUR 83 / ha for grassland management (EUR 84 / ha under the transitional period), deduction - 32 €/ha in I. zone of NP or ESA.

  - EUR 69 / ha for arable grassland management (EUR 79 / ha under the transitional regime) period).

  From 2015 to 2020, a new support system for organic farming is valid, as defined by Regulation (EC) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repeal of Council Regulation (EC) No 1698/2005.

C. Environmental policy

Anyone who does not qualify for subsidies for grassland management provided by the Ministry of Agriculture of the Czech Republic may apply for support from the Ministry of the Environment.

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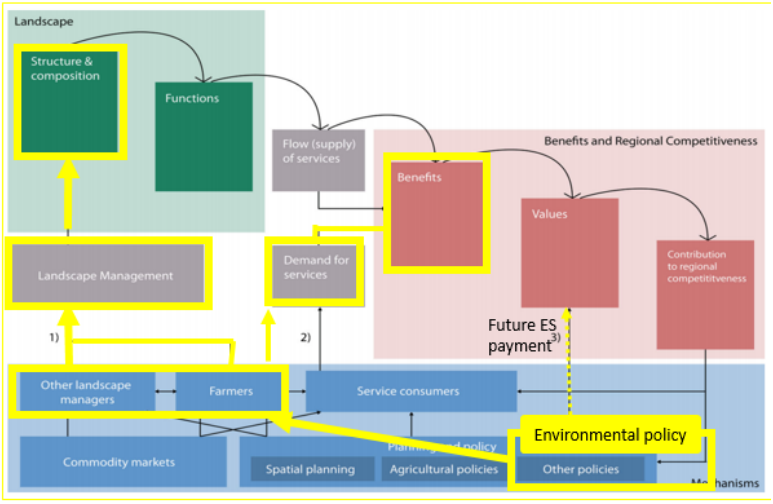
Figure 27. Diagram of regional development policy logic in Czech Republic.

Policy	Policy instrument
Environmental policy	Landscape protection and restoration programme
	Strategy for Adaptation to Climate Change in the Czech Republic 2015
	National Action Plan for Renewable Energy



- **Landscape Management Program.** This subsidy is intended to support non-investment activities in the field of landscape protection against erosion, maintaining the cultural condition of the landscape and supporting species diversity. For example, the restoration of margins, drawers, wetlands, the construction of small polders, the planting of line stands and solitary trees, the restoration of near-natural forests, protection of memorable and important trees, mowing grass and reeds in places of endangered species also provided for the care of specially protected areas and bird areas (national parks, protected landscape areas, nature reserves, NATURA 2000 areas, etc.) are all funded, together with protected species of plants and animals (AOPK CR, 2019).

- **Strategy for Adaptation to Climate Change in the Czech Republic 2015.** The aim of adaptation to climate change is a timely reduction of the vulnerability of systems (natural and socio-economic) and their higher resilience to its impacts without compromising the quality of the environment and the economic and social development potential of the society. Adaptation is a set of measures implemented continuously, gradually and in the long term, as well as the actual process of their implementation over time. Adapting to climate change will require a proactive approach at local, national and international levels. Through the Adaptation Strategy of the Czech Republic, the government will cooperate with strategic partners to reduce the vulnerability of the Czech Republic to the effects of climate change. This process must involve state administration bodies, local governments and organizations providing public services. The aim is to ensure that, with effective and coordinated planning, the Czech Republic will be significantly more resilient to future climate change impacts and at the same time will grow economically.

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The main goal regarding PG management is to promote the establishment of grassland and afforestation in areas vulnerable to soil erosion and degradation, in the case of grassing also in nitrate sensitive areas and along water bodies or in buffer zones of water resources

In addition to the existing instruments, payments for ecosystem services are proposed as a potential economic instrument, but the possible future introduction of these is conditional on the existence of a functioning national ecosystem services evaluation system carried out in accordance with a single approach at least at European level.

- **The National Renewable Energy Action Plan for the Czech Republic** has proposed a target of a 13.5% share of energy from renewable sources in gross final energy consumption and the fulfilment of a target of a 10.8% share of energy from renewable sources in transport in gross final energy consumption. The National Action Plan aims to meet renewable energy targets on the grounds of current and planned realistic projects and the expected realistic prediction of future development based on the statistical monitoring of trends and taking into account the subsidy policy where relevant.

D. Regional development policy

The regional development policy can influence PG management and ES directly and indirectly in cooperation with the MoE and MoA. Among the two most important instruments the subsidies from Operational program – Environment and the Land Consolidation Acts have been identified.

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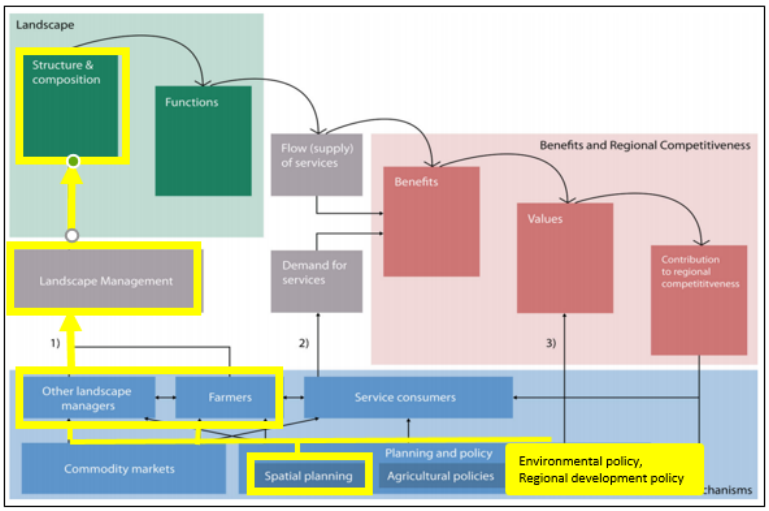
Figure 28. Diagram of regional development policy logic in Czech Republic.

Policy	Policy instrument
Regional development policy	OP Environment (OP Environment)
	Land consolidation is governed by Act No. 139/2002 Coll. of 21 March 2002



4.2.1.6 Stakeholders understanding of policy effectiveness

4.2.1.6.1 Data collection

To validate the results of the policy mapping, policy experts from different stakeholder groups were interviewed. Following the guidance provided by Task 4.1c coordinators:

- The most relevant stakeholder groups were identified using a snowballing technique (resulting in 33 candidates):
  - farmer's interests (n=9);
  - environmental interests (n=4);
  - national government (n=4);
  - regional government and public (n=8);
  - academia and consulting (n=8);

  from which 10 representatives were selected according to their availability and recommendations from the Czech expert group. Finally, the following stakeholder group structure was obtained:

  - Farmers interests (n=3)
  - Environmental interests (n=2)
  - National government (n=2)
  - Regional government (n=2)
  - Academia and consulting (n=1)

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- Cover email, Information Sheet explaining the identified most relevant policies and standard interview questions (mandatory) were developed and tested.

The 10 interviews were conducted between 22 May and 30 July 2019. Three interviewees consented to the use of audio recordings; four rejected audio recording and so a written record was used; three interviewees preferred to send in written answers to the questions and official position documents.

4.2.1.6.2 Main results of stakeholder's perception

Stakeholders' objectives, concerns and perceptions of the relevance, legitimacy, democracy, efficiency and effectiveness of the Czech PG policy-mix often change with spatial scale from local to global. At the scale of an individual farmer's interest, stakeholders are primarily focused on maximizing yields and incomes and minimizing negative environmental impact of their activities that can reduce future achievements. Individual private farmers encompass a broader array of outcomes than simply profit maximization – health outcomes, cultural preferences, and agro-ecological conditions, landscape creation and sustainability. Moving to the regional scale, the optimal spatial arrangement of land use (to increase ecological stability, regional economic viability), subsidy distribution and cooperation of land managers and other stakeholders were most relevant to the interviewed stakeholders. At the national/global scale the national food security, water scarcity, climate change, biodiversity and problems of market and policy forces were mentioned.

The main policy mapping aspects that can be derived from answers and positions of representatives interviewed can be summarized as follows:

Relevance: most respondents considered the identified policy-mix as relevant for PGs, but the significance of individual tools for PG management is very different. Agricultural support policy (subsidy payments and management restrictions) was indicated as the most significant. There are several other policies mentioned (for example wolf protection) that go in the opposite direction by creating negative impacts and competing pressures on PGs.

Legitimacy: most stakeholders recognized that sustainable PG management requires policy to balance production and environmental objectives. The ES associated with PG are generally well recognised by the Czech population.

Democracy: Some of the policies or subsidy distributions are not satisfactory for all stakeholders (conflicts between "small and big" farmers, agricultural and general public interests). A lower rating

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of democracy resulted from the perception of a weaker negotiating position at EU level, a better position and lobbying in the interests of large enterprises. On the other hand, most of the stakeholder group representatives stated that they had some involvement in the policy design process.

Efficiency: the majority of respondents perceived low levels of efficiency in the policy mix. Stakeholders indicated that the current policy is costly and that instead of ES maximisation, PG management is driven by subsidy maximisation. To a large extent, farmers respond to the incentive scheme offered by the government, but there is also need for getting stimuli from local communities to better facilitate the activities of farmers and to develop local products and markets. Interviewed farmers reported that they wished to build up their conservationist reputation amongst the local population.

Effectiveness: The majority of respondents assessed effectiveness as very low. It is good in terms of PG quantity (maintenance of the share of PG) in the Czech Republic but very low in terms of PG quality and productivity. Participants mentioned the problem of unmeasurable or unmeasured public benefit. Incentives provided by the Ministry of Agriculture and their conditions largely determine farmer's activities. Minimum livestock units induce more or less commercial farming with relatively sophisticated marketing (beef market). This kind of prescribed farming seems not to be economically viable, or difficult to implement in terms of conversion of farming practices at the present time. Therefore, farmers have to look for supplementary assistance. At the moment they are attracted by the suckler cow premium, by the premium for cattle or sheep on pasture and by payments for ecological production. In the case of the latter, farmers are driven into more sophisticated marketing efforts. In effect, the transaction costs associated with producing and delivering the public good of landscape and wildlife is becoming complex with quite a high degree of uncertainty given by the underdeveloped or unknown local market for ecological products. Ecological farming also requires considerable human capital. Generally, commercial farmers have exhibited their willingness to protect landscape and wildlife, although their commitment has been limited to the minimum income they need to survive. From this perspective, the above mentioned mounting subsidies (additional payments for additional commitments), could still be provided through incentives as suggested by the Ministry of Agriculture and Agricultural Agencies (Regional offices of MoA) but farmer's participation might rather reflect their tendency to reduce the risk from programme changes, hence, rather to stabilise their income than maximise it. This might be particularly the case of ecological farming to which most of farmers switched without knowing anything or very little about the potential market for their products.

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A. Indicated problems and unexpected consequences of the current policy mix

The use of PG biomass for energy, which can favour invasive plant species, is supported by policy.

Low and decreasing level of self-sufficiency: competitors from a number of Western European countries are strengthening their production thanks to direct and indirect subsidies, and they carry their market surpluses to the Czech Republic at low cost.

Failure to comply with procedures and crops - ploughing part of declared PG and cultivating another culture than PG (arable crop).

The provision of financial support for the maintenance of PG is conditional on the implementation of agricultural management by 31 July annually, and a month longer in the case of mountain less-favoured areas. In the current situation of extreme drought, where the rapid improvement of conditions and productivity is not expected, this condition is too strict, and results in severe disturbance or destruction of grasslands and the inability to provide a sufficient feed base for farm animals.

Low soil fertility and mountain farming results in very limited ability to manoeuvre and cope with market fluctuations. For example, it is difficult to switch to other commodities. In particular, farms with a large proportion of grassland have no choice but to breed herbivores grazing grass and then sell their produce. This may be both the sale of cattle and the finishing and sale of meat. Younger cattle for fattening, which is now the most common form of sales, must also be considered a market-oriented product.

There are also threats to grazing livestock at pasture due to increasing wolf abundance in the Czech Republic. Problems with decreasing PG productivity will be coupled with the higher costs to fulfil the condition of a minimum number of livestock units.

Local authorities (mayors) stated clearly that they found the nature component and landscape character belonged mainly to the local community. Therefore, they had reservations about the current way of organising landscape and wildlife provision. In the MoA current policy, local municipalities have not identified the importance of small local land users and owners who might substantially contribute to the character of the area. They appreciated that MoA compensations saved jobs for local people, while they were extremely critical of the fact that programme designs allowed large commercial farms to exercise power over small landowners.

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Due to long term drought in the Czech Republic, payments which should compensate for lower forage production are not sufficient as the price of hay has increased significantly in recent times. Support for bioenergy production also caused problems at many farms as it forces farmers to manage activities intensively.

The farmers' association formulated following position of farmers to the European Union's Common Agricultural Policy after 2020 (CAP):

…" We are afraid of the transition from greening to the new „eco-scheme „of direct payments, as it will bring settings disunity to this tool between the Cz and re-raise the already unbearable complexity of the system and administration. At the same time, especially in the environmental challenges field, we are worried about the implementation of so-called „result-oriented" measures in both pillars of the CAP, as the monitoring and evaluation of these targets are not only burdened by great uncertainty (especially the weighting of external factors affecting these indicators) but the actual outcomes of the intervention may take decades to show up, which is longer than the CAP programming period. "

…"We call for a fundamental change in the CAP and its instruments. We believe that this policy must move from an outdated system of unaddressed payments to modern incentives that will benefit society. In this way, support would be directed to farmers producing public utility as activities aimed at protecting the climate or protecting wild plants and animals on the land they manage."

B. Desired changes in policy mix and logic

To focus on "sustainable management of natural resources", to reduce the administrative burden of adapting area-based programs to the ecosystem protection requirements of a specific area (Environmental Protection Agency permission).

Higher investment to processing and value added, education of consumers to be more environmentally and socially responsible, support of small and medium enterprises, new repayable forms of financing.

Better scheduling of compliance controls.

The Association of Farmers asks the Ministry to allow, in justified cases, the postponement of the necessary mowing of meadows and pastures. This is not about introducing a blanket exemption, but about the possibility of a flexible solution in locations where it is needed. As a specific starting point, it is possible for the farmer to apply for this option to the State Agricultural Intervention Fund (SZIF),

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which would decide, either directly or after consulting the local nature protection authority, based on the current situation. However, this process is too long and the result is uncertain

The sector must be seen as a wide-ranging complex system involving both the agricultural and food industries, with the involvement of all overlapping and related fields, including forestry and fisheries. This needs to be underpinned by agricultural education and training to address generational change. *"I also see the interconnection of the outputs of science and research into practice itself."*

To provide a functional partnership for rural areas, to create or to confirm, in collaboration with partners, the foundations of value principles and rural philosophy motto "*We give the countryside a sense*".

"*To link the rural philosophy with practical rural development activities in a functional system*"

The government has concentrated only on two instruments: restrictions and subsidies. There is a need to improve in the dissemination of information, and the building up of extension services.

Regarding the threats for wild animals and biodiversity, the participants reached agreement on extending the Land Parcel Identification System with new functionality. In the future, it should be possible for the farmer to enter information on the mowing date in the LPIS, which will notify the tenant of the hunting ground by e-mail. It will then be up to hunters to ensure that the wild animals are expelled from the mowed grassland in good time.

C. Identified conflicts of interest groups – Czech Republic

C.1. Environmental x Farming interests (PG managers)

- **Extensive PG management areas**

Significance of the conflict – area affected (requirement of minimum livestock density)

Protected areas: The total area of protected areas pursuant to Act No. 114/1992 Coll. is estimated at 1,722,400 ha (21.8% of the CR area). The total area of agricultural land in protected areas is about 392,000 ha of which 65% is PG area (254,000 ha)

Potentially also:

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Less favoured areas: According to LPIS evidence, the share of all land in LFA in the total agricultural land area is 50%, which represent a total eligible area of 1,073,000 hectares; grassland accounts for 80% of the total eligible land.

Organic agriculture areas: the total area of agricultural land for organic farming was approx. 12% of the agricultural land; PG represents 82.3% of the total land for organic farming

Driving force – climate change **– decreasing provision function of PG** (dry springs and summers)

Pressure - PG management in protected areas with environmental restrictions. Due to decreasing productivity of PG, the amount of homegrown forage for livestock production is insufficient:

- **Production of hay (dry matter) is not sufficient** for the required minimal stocking rate under PG management in protected areas (min 0.3 LU/ha in organic agriculture)
    - organic agriculture – 0.3 LU/ha is required to obtain compensation;
- **Farmers must buy feed,** with **hay prices rising sharply** in recent periods as a result of lower production (supply) and high demand (according to farmer the price of hay raised from the 400 - 500 CZK/bale of hay at reference period, when subsidy payment of compensation for costs and profit loss for desirable PG management systems in Protected Landscape Areas (PLAs) were calculated, at 2000 -2500 CZK/bale of hay last year and about 800 - 1000 CZK/bale of hay at present);
- **Subsidy payment is too low -** compensation for the required PG management system in PLAs no longer covers the increased costs of livestock production;
- Agricultural management of PG with requirement of 'environmentally friendly' management and minimum stocking density is **not profitable even after subsidy compensation;**
- Some PLA officers (representatives of environmental interests) have little understanding that local/rural development requires a compromise between economic and conservation interests.

Possible impact (provision function, biodiversity and landscape, recreation function):

- Threats to biodiversity supported by grazing extensive livestock farming;
- Threats to extensive/organic livestock production and ES supported by extensive livestock grazing - farmers can respond to reduced profitability:

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  - by reducing livestock (they have to sell calves, in organic farming it is difficult then to provide an organic way of fattening and the products are often sold as conventional, moreover due low willingness to pay of domestic consumers approx. 80 % of supported production is exported)
  - by intensification of production in order to compensate for the loss of subsidies by higher market returns (in LFA).
- Threats of land abandonment in PLA and marginal areas (or land concentration).

Suggested solution (policy adjustment):

- to increase the flexibility of PG management conditions and ensure the PG supply function will not be reduced (terms of mowing grass, possibility of restoration, liming, ...);
- to increase compensation (calculate the compensation for increased cost and profit loss for the new conditions);
- support of further diversification and finalization of PG based production;
- marketing support to increase consumer demand and willingness to pay for PG based commodities and services (fair prices).

Intensive PG management areas

Driving force: climate change has resulted in reducing the provision function of PG (dry springs and summers).

Pressure: Farmers want to increase their income by ploughing the PGs and converting it into arable land.

Strictly limited by law and conditions of greening (in the Czech Republic, however, the maximum 5% change in the proportion of PG in agricultural land is estimated at national level).

Suggested solutions:

- Higher grassland functionality by optimisation of plant composition.
- Grassland production and quality that matches livestock needs, taking into account wider problems of low profitability of livestock production (also due to open market forces).

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C.2. Interests of landowners' x farmers (PG managers)

Pressure: Landowners consider subsidies paid per hectare of agricultural land to be a rent yield and require higher land rent.

Impact: Higher cost of production – potential land abandonment in marginal areas, land concentration in big farms, intensification of production in order to compensate higher cost.

C.3 Interests of local communities' x farmers

Commercial farmers often do not have a good reputation for their activities with the local community.

Commercial farmers have exhibited their willingness to protect landscape and wildlife, although their commitment has been limited to the minimum income that they need to survive.

Largely, farmers respond to the incentive scheme offered by the government, but there is also a need for stimuli from local communities.

Local authorities are critical to the fact that policy designs allowed large commercial farms to exercise power over small landowners.

Suggested solutions:

- Education and involvement.
- Publicity and marketing of grass-based products and ES provided by PG.

C.4. Interests of Government x farmers x population

According to the position of the Ministry of Agriculture of the Czech Republic, the PG policy (CAP) is too administratively demanding, complex, and inflexible and does not contribute to the need to increase the competitiveness of European agriculture.

The CAP has also repeatedly failed in relation to the average farmer. The largest share of the budget (80%) goes to the largest farms (20%), so most farmers lose, and often they are those who manage areas with the highest biodiversity.

Many aspects of the current CAP are administratively demanding for both farmers and individual governments.

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There are two main areas in the first pillar of the CAP where farmers and NGOs agree that they are too complicated:

- Paying for greening: the flexibility guaranteed to Member States has made this "simple" policy actually quite complex. These payments are complicated to operationalise for farmers and for paying agencies. At the same time, research has shown that they have minimal impacts on the environment.

    - Eligibility of pasture for direct payments: livestock farmers who manage forested pastures and complexes consisting of different landscapes, encountering a high degree of bureaucracy and confusion when applying for direct payments. This is due to the increased control and limitations that result from overly simplified land use assessments.

  Suggested solutions: "*Direct support is only justified if it is linked to strict social and environmental criteria that contribute to the achievement of environmental objectives. Direct aid may also be used to support farmers in less-favoured areas, but must be based on defined farming conditions. In any case, money should not be paid solely because someone is farming in a particular area. It is clear that if direct support continues, it is necessary to introduce ceilings so that large sums of money do not end up in a few pockets. Conversely, the introduction of ceilings would not be necessary if payments were linked to the achievement of well-defined environmental and social objectives*".

C.5. Key challenges for PG management

- Higher grassland functionality by optimisation of plant composition.
- Grassland production and quality that matches livestock needs.
- Development of adequate and environmentally sensitive methods to renovate PG.
- Higher flexibility of PG management policy support conditions.
- Publicity and marketing of grass-based products and ES provided by PG.

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4.2.2 Spain – Mediterranean BGR

4.2.2.1 Characteristics and distribution of permanent grassland in the Iberian Peninsula

According to the "*Nomenclátor Básico de Pastos en España*" (Basic Nomenclature of Pastures in Spain), any vegetable resource that serves as food for livestock (and, by extension, wild fauna) is considered grassland, either in grazing or as fodder. Grazing makes it possible to take advantage of grazing resources (herbaceous and woody, shrub or arboreal), but, above all, it constitutes its main guarantee of persistence. In this sense, it can be said that there is no pasture without livestock (San Miguel et al., 2016).

Spain is a country with a long history of pastoralism and a great livestock tradition, so a high percentage of its territory is covered by pastures. According to agricultural statistics, meadows and pastures occupy around 7 million ha, a figure to which must be added that of the wastelands to pastures (4 million ha), esparto grasses (0.4 million ha) and, above all, that occupied by pastures with a sparse tree-cover, which are also very abundant (4.2 million ha). Thus, natural and semi-natural herbaceous plant communities cover more than 15 million ha or one third of the national territory.

The characteristics of the permanent grasslands (and by extension of the vegetation) of the Iberian Peninsula differ greatly in each of the biogeographical regions present in its territory. According to the European Environment Agency, there are three biogeographical regions in the Iberian Peninsula: i) the Alpine region, present only in the Pyrenees; ii) the Atlantic region, which comprises the north and northwest of the Peninsula; and iii) the Mediterranean region, which dominates the rest of the Peninsula and the Balearic Islands (see Figure 29).

The specific characteristics of each biogeographical region (climate, soil fertility, topography) determine its potential for the development of agro-livestock activities and with it, the diverse uses of the soil, adding greater variability to the natural and semi-natural pastures through the action of grazing. Due to the diversity and specificity on a local scale, the cartographic representation of permanent pastures on a large scale is very complicated. However, in Spain two main types of PG can be found according to the biogeographic region in which they are found (San Miguel et al., 2016):

- Atlantic and Alpine bioclimatic regions. Characterized by a cold climate in the high mountains and temperate in the medium mountains and lowlands, with practically no dry season. In the high mountain areas are the permanent natural grasslands of port formed by communities of

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species of small size and / or creeping habit. These pastures have a low-medium production only in summer; therefore, they can only be used by livestock in this season. In medium mountainous areas, natural forests (generally deciduous) and scrub prevail, while croplands (usually fodder crops), mesophytic permanent pastures and forest plantations dominate low and flat territories. Mesophytic pastures are semi-natural pastures created and maintained by grazing (cattle and wildlife) and dominated by perennial herbaceous plants. The most important livestock in this area is cattle and, to a lesser extent, sheep and horses.

- Mediterranean biogeographical region. It is characterized by a marked seasonality in the distribution of temperature and rainfall, and by high intra- and interannual unpredictability. In general, summers are hot and dry, which generates a notable hydric and thermal stress in the species that compose these ecosystems. Sclerophyllous forests and scrublands that usually follow a "mosaic" distribution cover the areas with the steepest slopes. Semi-natural pastures dominate the plains and gently sloping slopes with a dispersed arboreal (and sometimes bushy) stratum. Mediterranean perennial grasses predominate and dry out in summer. Its vegetative period is more or less prolonged depending on the cold and rainfall, and its productive potential is low, reaching maximums that coincide with the seasons of maximum rainfall and mild temperatures (spring and autumn). Herbaceous communities are very diverse depending on the type of soil and can be differentiated between acidophilous and basophilic grasses. The main use of PG is as forage for grazing small livestock, mainly sheep, or larger ruminants. Iberian pig farming is particularly important in areas of western and southwestern Spain, where the yields of acorns are higher. The most representative agro-ecosystem of pastures in this region is the dehesa[7].

4.2.2.2 Brief description of governance structure and policy context

The Spanish Constitution assumes the unity of Spain and recognizes the right to autonomy of the nationalities and regions that form it, establishing a system of recognition of territorial autonomy that legally and administratively materializes in a profound decentralization. Territorially the decentralization system is organized with 17 Autonomous Communities and 2 cities with statute of autonomy, Ceuta and Melilla.

[7] Dehesa is "an agrosilvopastoral system formed from the clearing of evergreen woodlands where trees, native grasses, crops, and livestock interact positively under management" (AGFORWARD, 2015).

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The Autonomous Communities have their own Statute of Autonomy, which gives them political and financial autonomy and includes their powers and the organisation of their institutions. They have their own Administrations, organised into regional Councils or Departments. Depending on the subject matter, they have transferred legislative and executive powers. They have four types of attributed competences that enable them to carry out the following actions:

- Exclusive legislative and executive powers. This is the case, among others, for agriculture and livestock, inland fishing, industry, commerce or tourism.
- Jurisdiction for the development of the basic legislation of the State, as well as for the implementation of this legislation. This is the case of the environment, economic policy, consumer protection, education, health care or public health.
- Powers to implement legislation approved exclusively by the State. It is above all the case of employment and professional training.
- Joint legislative and executive powers, although different from those that the State has in the same matter, so that at both administrative levels they can carry out actions and initiatives. This is the special case of culture.

The Autonomous Communities have financial autonomy. Their income depends partly directly on the State and partly on own resources obtained through their own taxes or part of those obtained through State taxes in the Autonomous Community.

An example of this decentralisation is the management of rural development policy. Competence in agricultural matters is transferred to the EU, and in accordance with its rural development policy 2014-2020, and in line with the national competence framework, 18 Rural Development Programmes (RDP) coexist in Spain:

- One National Rural Development Programme.
- Seventeen autonomous Rural Development Programs.

Each Autonomous Community has drawn up a RDP that, in addition to the horizontal measures and common elements set out in the National Rural Development Framework, includes specific measures to respond to different regional situations. Based on the RDPs, the Autonomous Communities and the Ministry of Agriculture, Fisheries and Food publish calls for aid so that potential beneficiaries (persons or entities linked to the rural milieu) can apply for them, obtain them and apply them in order to comply with the measures established in the plan.

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4.2.2.3 Details about the specific area of study (e.g. dehesa)

The *dehesa* is a characteristic and practically endemic agroecosystem of the Iberian Peninsula, which occupies approximately 1.3 million hectares in Portugal, where it is called *montado*, and some 2.4 million hectares in Spain. It is located in the Mediterranean bioclimatic region and mainly occupies the southwestern part of the Iberian Peninsula, principally the regions of Andalucía and Extremadura, coinciding with mainly acid soils with little productive potential. Figure 29 shows the location and extent of the dehesa and montado in the Iberian Peninsula.

The extension of the pasture in Andalucía is around 1.2 million hectares (10-15% of the area of the community), located mainly along the Sierra Morena, where they have a high level of spatial continuity, which facilitates the connectivity of habitats, and to a lesser extent in the mountains of Cádiz and Málaga. Figure 30 shows the location of the pasture in the region of Andalucía.

Figure 29. Distribution of dehesas in the Iberian Peninsula.

Source: FEDEHESA (http://fedehesa.org/distribucion-Geografica-de-las-dehesas/).

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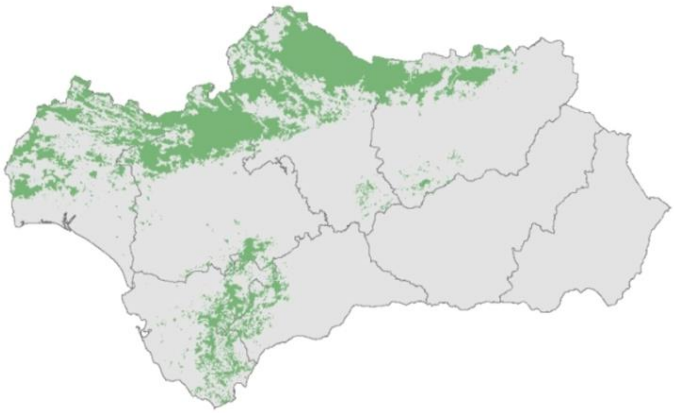
Figure 30. Distribution of dehesas in Andalucía.



Source: Junta de Andalucía, 2016.

The dehesa is considered a forest transformed into a system of land use and management based on the exploitation of livestock and forestry, hunting and agriculture, an area of grassland and Mediterranean forest with a dispersed presence of arboreal vegetation (Marañón et al., 2012). It is an agroecosystem in which the combination of agroforestry and pastoral management promotes important environmental values, such as a sustainable use of the territory, a balanced landscape and high diversity at different levels of integration, and stands out for its great potential to provide multiple ES (Gaspar et al., 2016; Garrido et al., 2017; Surová et al., 2017).

Given its great ecological, economic and social value, its great extension and the threats that threaten it, a large part of this area also has some degree of protection, being included as a habitat of Community interest in the Habitats Directive (92/43/EEC) and forming part of the Natura 2000 Network. International designations include the "Dehesas de Sierra Morena Biosphere Reserve", the largest in Spain, and the "Mediterranean Intercontinental", between Andalucía and Morocco.

Some of the main characteristics of the dehesas that help determine their high capacity to provide ES are detailed below:

A. Floristic diversity

In the dehesa, the local diversity of plants, especially annual herbaceous plants, reaches values comparable with the most diverse habitats in the world thanks to the mixture of different environments such as forests, pastures, scrublands and even crops.

The woodland is considered to represent the essential element of the dehesas due to the multiple functions it performs. The production of acorns, ramon, firewood and cork are its main functions. On

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the other hand, it stands out for its important ecological function, as trees play a fundamental role in stabilising the ecosystem and contribute significantly to the creation of different environments that favour biodiversity. The trees are mostly composed of species of the genus *Quercus*, mainly holm oak (*Quercus ilex* subsp. *ballota*) and cork oak (*Quercus suber*), and occasionally other Mediterranean species.

The presence of scrub in the dehesa is usually scarce, since its control, for the benefit of the pastures, is usually implemented through the management of livestock, rotating agricultural crops and clearing. However, shrubs play an important role in the pasture, contributing to soil stability, facilitating tree regeneration, diversifying the landscape and creating habitat for many species of wildlife, as well as constituting a valuable fodder reserve for livestock in less favourable years.

The herbaceous stratum constitutes the main productive resource of the dehesa. Herbaceous grasses have a high variability both in specific composition and in covering and phenology, depending on the type of soil, its humidity, the intensity of livestock use and the type of management. In the pastures of the dehesas there is a wide mosaic of plant communities with a great specific richness, superior in many cases to other systems with less human intervened. The most abundant pastures in the dehesa are made up of therophyte communities with a large presence of leguminous plants of pastoral interest. In those areas subject to intense grazing, there are "*majadales*", made up of annual and perennial species that constitute the type of pasture of the best quality that can be found in the dehesa. In the valleys and depressions with accumulation of runoff water there are pasture communities made up of perennial high grasses and a scarcity of legumes.

In the flatter and intervened spaces, forage crops appear in more or less spaced rotations, depending on the suitability of the soil. Crops in the pasture are used to provide food for livestock at times of reduced food availability and to control the degree of occupation of the scrub. The most common are cereals (oats, wheat, triticale, barley, rye) and some legumes (vetch, lupin) either alone or in mixtures.

B. Livestock and wildlife

Livestock in the dehesa include sheep, cattle, goats, pigs and horses, with several of them commonly present on the same farm. Sheep are the best adapted to the dehesa, with the Merina breed being the most representative. The Iberian pig is the most emblematic species; the commercial crossing with the Duroc Jersey breed being the most common. The beef herds are made up of rustic animals, mainly

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native breeds. The goat is relatively scarce and is associated with areas with greater presence of scrub. Sporadically we can find the Spanish horse and the Andalusian donkey grazing in the dehesa.

The wild fauna of the dehesa includes around 60 species of nesting birds, more than 20 mammals and as many reptiles and amphibians. This biodiversity is mainly due to the vertical heterogeneity of the vegetation (arboreal, shrubby and herbaceous strata), but also to the variation in very small areas of parameters such as the density of the trees, the thickness of the scrub, the presence of watercourses and tillage land, ponds, etc.

C. Main uses

The importance of dehesas lies mainly in the multiple and sustainable use of resources as a means of achieving the economic viability of farms. The use of dehesa must generate income and employment for rural areas. Otherwise, the dehesa is destined to the transformation of its uses and structure towards other forms of exploitation that are economically of greater interest for their owners.

The main use is the livestock farming. The dehesas were created mainly for pastoral purposes, so livestock is of vital importance not only from an economic point of view, but also from an ecological point of view, as it contributes to creating and maintaining the structure and composition of vegetation. Livestock farming is practised under extensive or semi-extensive formulas and is made up of a set of very rustic native breeds adapted to the environment in which they were selected, and by other foreign breeds introduced in relatively recent times that are crossed and acclimatised. In addition, mixed grazing is a common feature of dehesa farms, specifically the bovine-porcine, sheep-pig and bovine-ovine-porcine associations, with the presence of a single species on farms being less frequent.

Hunting, especially big game (mainly deer and wild boar), is an important source of income for rural areas with dehesa. Its compatibility with livestock is possible through the adaptation of management infrastructures and the maintenance of adequate livestock and hunting loads, thus avoiding damage to scrub and regenerated and minimizing health risks. The presence of small game species in the pasture is closely linked to the presence of herbaceous stratum and rotating cereal crops. The most common species are the rabbit, the red partridge, the wood pigeon and the quail. All of them are at the base of the trophic chain of other species of wild fauna, such as the Iberian lynx.

As far as the forest exploitation is concerned, where cork oak predominates, cork is an essential product, and in some dehesa it is the main economic resource. At present, due to the widespread use

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of fossil fuels, the use of firewood and charcoal from the pasture has decreased significantly. However, biomass (biocarbons, pellets, briquettes) can be an alternative to valorise the waste produced from silvicultural management. The abundance of the melliferous flora in the meadows makes beekeeping (honey, pollen and wax) a complementary activity that also contributes to improving the state of the vegetation. The harvesting of mushrooms and truffles has experiencing a very significant boom in recent years, making an important contribution to socio-economic development in many rural areas.

The poor and acidic soils of the dehesa have traditionally limited their agricultural use to cereals such as rye, barley or oats and to legumes such as vetch or lupins. Production is usually destined for the consumption of livestock (tooth, grain, straw or hay), while planting the crop favours the control of scrub.

Rural tourism in the area around the dehesa emerges as a novel activity favoured by the growing social esteem acquired by its environmental and cultural values, improved access to rural areas, facilities for welcoming visitors and new trends in holiday patterns. The richness of the cultural heritage is combined with unique natural and landscape resources, thus forming a joint offer of nature tourism or ecotourism, with possibilities such as hiking, cycle tourism, wildlife observation, game tourism, ornithological tourism, gastronomy, participation in agricultural or livestock activities, production of typical products, etc.

D. The dehesa and its capacity to provide ES

In the field of agro-ecosystems, the term ES refers to the goods and services from which the population benefits through the functions of agriculture, including not only those related to the production of raw materials and food derived from its nature as a productive sector, but also other social, territorial and environmental functions, linked to its relationship with the social environment, occupation of the territory, and its interaction with the environment (Fernández-Habas et al., 2018).

In Spain, the Millennium Ecosystem Assessment (MA) reports carried out at both national and regional levels in Andalucía have pointed to the close links between the conservation of ecosystems and the quality of life of the population (EME, 2011; Montes & García, 2012). The reports specify that not only are natural ecosystems capable of providing ES, but agroecosystems also have that capacity. This is due to the fact that, on the one hand, they are modified systems to provide food or materials, and on the other hand, thanks to the maintenance of a certain ecological integrity and the close relationship of dependence that they maintain with the human being, they have a high capacity to also provide

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regulation services (water regulation, CO2 fixation) and cultural services (landscape, local knowledge) (MA, 2005; Swinton et al., 2007; EME, 2011).

In fact, as previously stated when the characteristics of the dehesas were presented, they offer a series of environmental and socio-cultural services that are difficult to assess economically, but which nevertheless satisfy important collective needs. Thus, they play an important role in the conservation and maintenance of biodiversity, housing a profuse variety of species of wild fauna, flora and autochthonous livestock breeds, some of which are threatened. In addition, it contributes to soil conservation and regulation of the water cycle, thanks to the fact that the existing herbaceous vegetation cover improves water filtration and slows down erosive processes, increasing the useful life of the reservoirs, the recharge of the aquifers and the capacity of the soil to store it.

On the other hand, the woodland of the dehesa, with slow-growing species, contributes significantly to the fixation of CO_2, mitigating the greenhouse effect and global warming. Likewise, the discontinuity in the vegetation of the dehesa ecosystems, the dispersed trees and the scarcity of scrub due to the control exerted by the livestock, help significantly to prevent fires.

The dehesa plays a fundamental role in the maintenance of the rural landscape and possesses a great abundance of singular architectural elements (“cortijos”, “zahúrdas”, etc.). The latter, together with the enormous wealth of ethnography (traditions, customs, knowledge), folklore, craftsmanship and even linguistics (due to the abundant specific vocabulary), favours the preservation of cultural heritage, both tangible and intangible. Gastronomy deserves a separate mention, as the meadow stands out for its capacity to produce high quality food (hams, sausages, honeys, cheeses, etc.), generated with a high degree of animal welfare compared to intensive production models and in a way that respects the environment.

The fixation of the rural population with signs of identity, and a way of life directly linked to the territory, is ultimately the consequence of all the goods and services provided by the dehesa for the benefit of society as a whole.

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4.2.2.4. Some key challenges and threats to dehesas and their impact on ES provision

The integration of the dehesas and their links with other adjacent systems, such as scrublands, mountain olive groves and Mediterranean forests, have shaped a territory characterised by its ecological stability, diversity, landscape, history and culture. However, despite the identification of multiple services, values and functions linked to these two systems, the reality is that their future is currently uncertain. Marginal and less productive areas are experiencing extensification in land use (Tárrega et al., 2009). The more central and productive areas have been shifting towards more intensive agricultural production and intensification of pastoralism, mainly in response to world food trends (Nonhebel & Kastner, 2011). These changes are reflected in their spatial fragmentation, homogenization, lack of tree regeneration, vulnerability to ecological disturbances, and increased risk of soil degradation (Surová et al., 2017). These trends are jeopardizing the multifunctionality and sustainability of Iberian silvopastoral landscapes and compromising their ability to sustain the well-being of society in the long term.

In addition to the changes produced in these traditional agroecosystems, the integral and dynamic study of ES provision necessarily involves analyzing the forces that provoke and force them. In this sense, in recent decades, as a consequence of the prevailing economic model and human activity itself, a series of rapid and intense changes have taken place in those factors, of natural and anthropic origin, which act unequivocally on the functioning of ecosystems, and which have become the main direct drivers of change in the natural capital of Andalucía. These include: i) changes in land use; ii) climate change; iii) pollution; iv) invasive species; iv) alterations in biogeochemical cycles; and v) overexploitation of eco-services and biotic resources (Montes & García, 2012).

In the specific case of traditional agroecosystems such as pastureland, on many occasions the main pressures exerted on them, and their corresponding repercussions on the state of the ES, have been determined by exogenous factors on which the impact capacity of farmers and territorial actors is very limited (climate change and pollution; food, economic, financial, political or social crises; natural, industrial or epidemiological disasters; technological changes, etc.). However, on other occasions these changes in the state of the ES are the result of the decisions made by the farmers themselves and the agricultural management practices they carry out (Fernández-Habas et al., 2018). The practical and daily management of agroforestry operations, although shaped by their own structure, economic framework, social norms and local context, is *mainly influenced by the perceptions, preferences and risk aversion of the farmers themselves* (Darnhofer et al., 2010).

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Indeed, the persistence of natural and semi-natural herbaceous formations in Spain is closely linked to that of traditional land management models, and their conservation cannot therefore be limited to the absence of intervention. Extreme protection and the absence of management are true sentences of disappearance or degradation for pastures and all the natural and cultural heritage linked to them (San Miguel, 2009).

The correct management of pastures and their capacity for the provision of ES necessarily involves knowing their ecology, composition, structure and functioning, as well as mastering agricultural techniques. Empirical studies on the trade-offs between agricultural production functions and ES production show "winning" relationships in both senses. Relatively small changes in agricultural management practices can achieve equilibrium by ensuring both food production and the production functions of agricultural ES (Garbach et al., 2016). Such results can help to consider, in decision-making, how best to implement multifunctional agriculture so that crop yields and ES provision can be maintained or increased.

4.2.2.4 Public intervention in the dehesa

The challenges faced by the dehesa, the consequences for the provision of ES and the negative repercussions that this entails for the well-being of society, justify the need for public intervention. Andalucía is the Autonomous Community that has developed the most normative instruments and protection figures for the conservation of the dehesa in Spain.

On 6 November 2002, UNESCO declared the “Dehesas de Sierra Morena Biosphere Reserve”, and Council Directive 1992/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna includes as a habitat of Community interest sclerophyllous forests for grazing, of which the dehesa is the most representative element.

The Governing Council of the Regional Government of Andalucía, through the Agreement of 18 October 2005, promoted the Andalusian Pact for the Dehesa, with the support of public administrations, universities, trade unions and business organisations, professional agricultural organisations, federations of municipalities and provinces, environmental organisations and other representative public and private entities, with the aim of creating a stable framework of cooperation for the defence of the dehesa. The Pact established the need to adopt urgent measures, supported by society as a whole, to guarantee the conservation of the dehesas.

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Under this framework, work began on the drafting of a specific law recognizing the dehesa as an integral and multifunctional space, and that this recognition should have administrative expression. As a result of this agreement, Law 7/2010 was enacted for the Dehesa de Andalucía, the only example of a specific law for the regulation of this agroforestry ecosystem in Spain. The development of Law 7/2010 received a notable boost with the approval in 2012 of the project "LIFE11 BIO/ES/000726 Dehesa Ecosystems: development of policies and tools for the management and conservation of biodiversity (LIFE+ bioDEHESA)" whose objective has been to promote the sustainable and integral management of the dehesas and to promote the main management instruments provided for therein.

In addition, on 24 October 2017, the Master Plan for the Andalusian Dehesas was approved by Decree 172/2017. This Plan in accordance with Article 5 of Law 7/2010 is the general planning instrument for the dehesas located in the Autonomous Community of Andalucía. It is valid for twenty years and will be subject to at least five-yearly revisions. Its main source of funding is the Rural Development Programme (RDP) for Andalucía. In the Spanish context, Andalucía is the Autonomous Community that has allocated more budget and measures for the dehesa has included in its RDP for the framework 2014-2020 (Szedlak & Gento, 2018).

In addition to these specific policies, there are others of a more general nature that also have an impact on permanent pasture and meadows. The following sections delve into the identification and analysis of these policies based on their effectiveness and capacity to contribute to the provision of ES.

4.2.2.5 Identifying policies relevant to permanent grassland

4.2.2.5.1 Data collection

The identification of policies that have an impact on the provision of ES by PGs (both national and European) has been carried out using the Delphi method. The application of this method has entailed the prior identification of qualified informants with expert knowledge in the field to be analysed. In the case of Spain, a group of permanent experts external to the SUPER-*G* project has been formed to be able to consult on the issues that emerge in the wp4 and in the rest of the other work packages. This group of experts provides a complementary vision to that of the researchers involved in the project.

The permanent group of experts was formed based on the following criteria:

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i. Incorporation of the different visions of the actors involved in the management of PG. In many cases the actors have conflicting interests depending on their relationship with the use of resources, so that for the formation of the group have been selected representatives of the different types of stakeholders who are involved in the development and promotion of dehesas;

ii. Selection of the person who represents the interests of each type of stakeholder taking into account both their expert knowledge and previous experience in projects related to PG, dehesas and the provision of ES.

Based on these criteria, Table 10 lists the main stakeholders that were selected as permanent collaborators:

Table 10. Permanent stakeholders' groups in Spain.

Stakeholder types	Organization
Landowners/Farmers	Dehesa owner and farmer
Cooperatives	South West Ovine (OVISO)
Public Administration	Department of Agriculture, Fisheries and Rural Development of the Regional Government of Andalucía
Conservation Organization	WWF - Spain
Researchers	Animal Production Department of University of Cordoba

4.2.2.5.2 Policy mapping

As a result of the Delphi analysis and independent consultations with the permanent stakeholder group, European and national/regional/local policies that influence the provision of ES by PGs have been identified. The content of these policies has been analysed with secondary information sources using the "policy analysis table" (PAT). The most relevant information from the PAT is shown in Table 11.

Some interesting elements of analysis on policy design and content can be drawn from the PAT analysis:

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- Six main policies affecting PG and dehesas have been identified. Of these, 2 acquire more relevance (CAP Pillar I, and CAP Pillar II - Rural Development Programme for Andalucía 2014-2020), not only because of their coverage and level of budget, but also because the instruments and measures that make up the other 4 policies are largely derived from those contemplated in those two.

- Ten main policy instruments have been identified. Among them, the 3 included in CAP Pillar I and the 4 included in CAP Pillar II - RDP for Andalucía stand out, mainly because they are contemplated within the two main policies with an incidence on permanent pastures, but also because they are the instruments with the highest level of concreteness in their design.

- Among the main policy instruments, it is worth highlighting those that are directly related to PG and dehesas because they have been designed exclusively to respond to the specific problems of these agroecosystems. These are the "Greening - maintenance of PG" of CAP Pillar I and "M10.1.3", "M8.2.1", and "M4.4" of CAP Pillar II - RDP for Andalucía.

- In addition to the policy instruments listed in Table 11, it has been possible to identify other instruments that may have an impact on dehesas (mainly other measures of RDP for Andalucía), but which have not been included in the analysis due to their general nature within the agricultural sphere.

- Of the 10 instruments included in the analysis, eight were voluntary instruments (economic incentive) and two were mandatory instruments (regulation). Among the eight instruments, there were two that by their nature were considered incentives, but that have an important obligatory component, since they are mandatory under the CAP. None of the instruments envisaged was of an informative or persuasive nature.

- Most of the policies and instruments covered in the analysis contain information on the main problems to be addressed, the assumptions on which the policies and instruments are based, and the objectives pursued by each of them. This information is needed to analyse at the design stage the relevance of the policy and its instruments. In a first analysis, it seems that most of the policies are generally relevant (except for the Nitrates Directive, which according to secondary information is rather a regulation imposed by northern European countries to solve a problem that is not evident in the case of Spain), but this is an issue that will be analysed later in point 3, based on interviews with stakeholders.

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- In the secondary information consulted, it is stated that different economic and social actors involved in the development and promotion of the agricultural sector have participated in the design of policies (mainly with regard to CAP Pillar II - RDP for Andalucía), all with the aim of collecting the different interests, sensitivities and demands towards this sector. These questions of democracy and legitimacy will also be contrasted later in point 3 from interviews with stakeholders.

- It has not been easy to find secondary information on the results achieved after policy implementation. Since the policies are currently in force, in some cases the instruments have either just been implemented or have not yet been implemented. In other cases, the evaluations carried out are generic and do not allow reporting on the effectiveness and impact of the policies and instruments. These issues will also be analysed in point 3 of the document through the opinions stated by the stakeholders interviewed.

- The complications noted above, as well as the lack of information on the breakdown of the budget at the level of some measures and instruments, have also hampered the analysis of efficiency.

- Finally, it is important to point out that the description of most of the measures/instruments specifies (explicitly or implicitly) which ES are intended to provide or improve with the actions contemplated in them.

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Table 11. PAT summary for Spain.

Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument	ES provision
CAP Pillar I **(Regulated at European level and implemented at national level)**	(i) Viable food production; (ii) Sustainable management of natural resources and climate measures; (iii) Balanced territorial development	Basic Payments	Guarantee a minimum income to farmers	Incentive instrument (voluntary) but with an important regulatory component (mandatory)	Provisioning services: products obtained from ecosystems such as food; Cultural services: cultural heritage
		Greening - Maintenance of PG	Compensate the costs associated with the supply of environmental public goods not remunerated by the Market	Incentive instrument (voluntary) but with an important regulatory component (mandatory)	Supporting services: habitat, lifecycle maintenance, gene pool protection Regulating Services: climate regulation, water regulation, water purification Cultural services: aesthetic values, recreation, ecotourism, education and spiritual values
		Additional Payments	Support specific sectors or types of agriculture that are particularly important for economic, social or environmental reasons, and that are going through difficult situations with the risk of abandonment of the activity	Incentive instrument (voluntary)	Provisioning services: products obtained from ecosystems such as food; Cultural services: cultural heritage
CAP Pillar II - Rural Development Programme for Andalucía	The achievement of the objectives of rural development shall be pursued through the following six Union priorities for rural development: priority 1) foresting Knowledge transfer and innovation in agriculture,	M10.1.3. Conservation and improvement of pastures in dehesa systems	i) increase the biodiversity of pratense species as a stabilizing factor against edaphoclimatic variations; ii) improving pasture areas in the dehesa in order to optimise biomass production capacity which increases carbon sequestration capacity and contributes to reducing soil	Incentive instrument (voluntary economic subside)	Provisioning services: genetic resources; biomass production Regulating services: carbon sequestration; biodiversity conservation Supporting services: soil

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(Regulated at European level and implemented at regional level, NUTS 2)	forestry, and rural areas; priority 2) enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and sustainable management of forests; priority 3) promoting food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture; priority 4) restoring, preserving and enhancing ecosystems related to agriculture and forestry; priority 5) promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sector; priority 6) promoting social inclusion, poverty reduction and economic development in rural areas		erosion; and iii) the maintenance of a stocking density in pasture between a minimum and maximum threshold depending on the carrying capacity of each territory		organic matter; water retention; reduced risk of erosion; soil fertility
		M8.2.1. Aid for the establishment and maintenance of agroforestry systems	to carry out the following actions in the dehesas: i) implementation of a new agroforestry system; ii) renewal or regeneration of an agroforestry system; iii) establishment of a new agroforestry system when a change of main species is necessary or a disaster has occurred that has affected the woodland	Incentive instrument (voluntary economic subside)	Regulating services: carbon sequestration; biodiversity conservation; forest fire prevention Cultural services: involving rural population in proper management of pastoral resources; landscape
		M4.4.4. Support for non-productive investments for the regeneration of woodland from dehesa formations	i) improvement of the state of the woodland in the dehesas, paying special attention to the incidence of radical rot and other factors causing decay; ii) installation, repair and conservation of infrastructures to ensure the viability of the agroforestry system. This measure is complementary to measure 8.2 "Aid for the establishment and maintenance of agroforestry systems".	Incentive instrument (voluntary economic subside)	Regulating services (carbon sequestration; biodiversity conservation; forest fire prevention) Cultural services (involving rural population in proper management of pastoral resources; landscape
		M4.1.1. Improving the overall performance and sustainability of	support will be given to initiatives involving investments in physical assets (tangible or intangible), which must be carried out in order to improve the overall performance and sustainability of agricultural farms by modernising and/or improving their economic performance	Incentive instrument (voluntary economic subside)	Provisioning services: improvement of farm performance; Regulating services: improvement of farm sustainability;

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		agricultural farms"	and optimising their energy efficiency. Improving the overall performance and sustainability of Dehesa farms		Cultural services: maintaining the population in rural areas
Nitrate Directive **(Regulated at European level and implemented at national/regional level)**	The Nitrates Directive aims to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution.	Nitrates Action Programmes in each Autonomous Community	with the aim of eliminating or minimising the effects of nitrates on water	Regulatory instrument	Provisioning services: water quality
		Cross- compliance as an instrument to protect waters against nitrate pollution	Under the CAP, cross-compliance, which refers to mandatory EU standards for the environment, food safety and animal health and welfare and makes the payment of certain aids to farmers subject to compliance with a number of conditions, including those under the Nitrates Directive	Regulatory instrument	Provisioning services: water quality
Habitats Directive **(Regulated at European level and implemented at national/regional level)**	The purpose of this Directive is to contribute to ensuring biodiversity through the conservation of the natural habitats and the habitats of wild fauna and flora in the European territory of the Member States (Article 2 of the Habitat Directive)	RDP: Priority Action Framework for the Natura 2000 Network in Spain 2014-2020 (PG and dehesa RDP measures: M29; M31; M35; M41; M46; M52; M62 y M79)	It is hoped that these frameworks can serve, among other objectives, to guide the operational programmes of European funds in this funding period	Incentive instrument (voluntary economic subside)	Provisioning services: genetic resources, biomass production. Regulating services: carbon sequestration, biodiversity conservation. Supporting services: soil organic matter, water retention, reduced risk of erosion, soil fertility. Cultural services: involving rural population in proper management of pastoral resources, landscape

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EU Climate Change Adaption Strategy **(Regulated at European level and implemented at national/regional level)**	The strategy is composed of the following three objectives, divided into 8 actions: 1) Promotion of actions of adaptation in the Member States: Promotion of national adaptation strategies in the Member States, Application of the LIFE financing instrument for adaptation and Promote adaptation initiatives at the local level; 2) Expansion and dissemination of knowledge about adaptation for decision making: Collaboration and support for research and transfer of knowledge about adaptation and Development of the platform Climate-Adapt; 3) Promotion of adaptation of vulnerable sectors: Facilitate adaptation actions in the CAP, Cohesion Policies and Common Fisheries Policy, Ensure the establishment of infrastructure adapted to the climate change, and Promote financial products and insurance for investment in adaptation	The policy instruments for combating climate change in the dehesas are those covered by CAP pillar I and CAP pillar II (previously analysed)	The policy instruments for combating climate change in the dehesas are those covered by CAP pillar I and CAP pillar II (previously analysed)	Incentive instrument (voluntary economic subside)	The same as the instruments previously analysed in CAP I and RDP

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Master Plan for the Andalusian Dehesas **(Regulated and implemented at regional level)**	i) Improvement of the economic viability of farms and of the productive sectors and activities associated with Andalusian dehesas; ii) Promoting territorial cohesion, improving the quality of life in the territories, supporting the diversification of the rural economy, and promoting the cultural and ethnographic attributes of the Andalusian dehesas; iii) Ecosystem conservation in the territories in which dehesas are located	The same instruments for the dehesa included in the Rural Development Programme for Andalucía 2014-2020	The same instruments for the dehesa included in the Rural Development Programme for Andalucía 2014-2020	Incentive instrument (voluntary economic subside)	The same as the instruments analysed in RDP for Andalucía

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4.2.2.5.3 Policy logic

In the context of the cascade framework, policy instruments can be differentiated into three types: (i) those aimed at changing the structure and composition of farms and thereby influencing the flow of ES; (ii) those aimed at fostering the demand for ES which in turn contribute to improving the provision of ES; and (iii) those aimed directly at increasing the benefit and value of services.

In this context, all policy instruments analysed have been classified within the group of instruments addressed to farmers, group of farmers or other owners (e.g. dehesas in communal property) that have a direct influence on the structure and functioning of farms and, consequently, on the greater or lesser provision of ES. In some cases, these are agricultural policy instruments and in others they are territorial policies (agricultural and rural). Figure 31, Figure 32 and **Figure 33** show the policy logic diagrams for each instrument or group of instruments of this type.

On the other hand, although there are policy instruments aimed at promoting the demand for services and products that contribute to increasing the provision of ES (e.g. measures aimed at promoting products of differentiated quality, PDOs, etc.), these are not specific to dehesas and PG, for which reason it has been preferred not to include them in the analysis.

Finally, no instruments were found that are directly aimed at increasing the benefit and value of ES.

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Figure 31. Diagram of policy logic for agricultural policies in Spain.

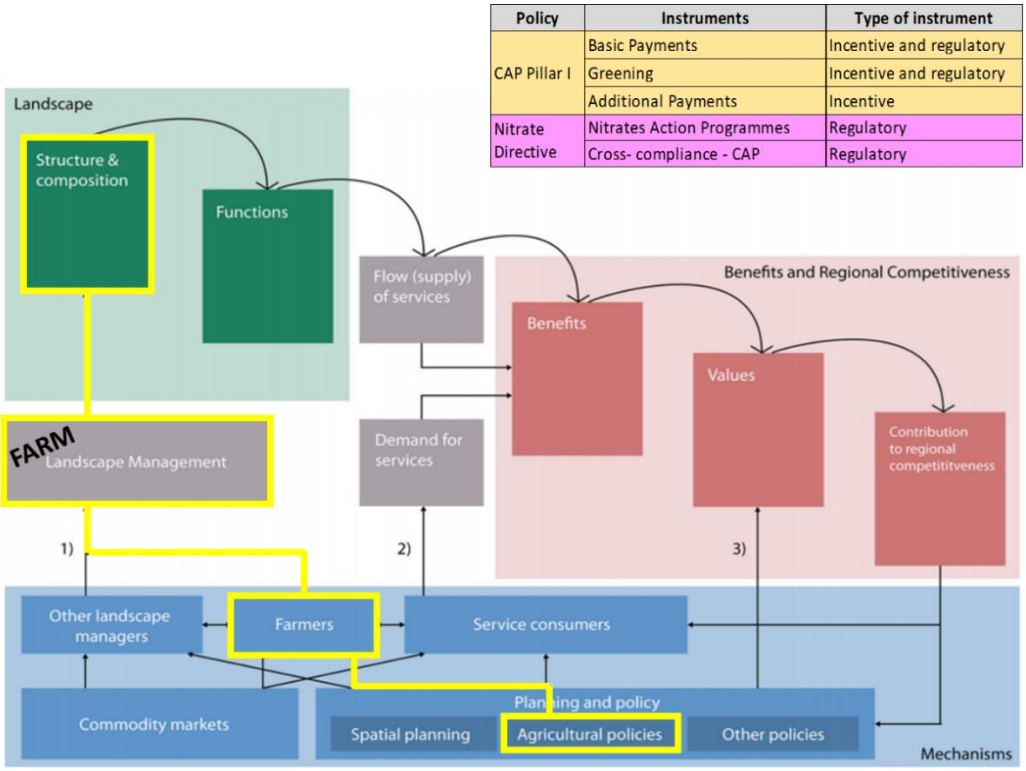

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Figure 32. Diagram of policy logic for territorial policies in Spain.

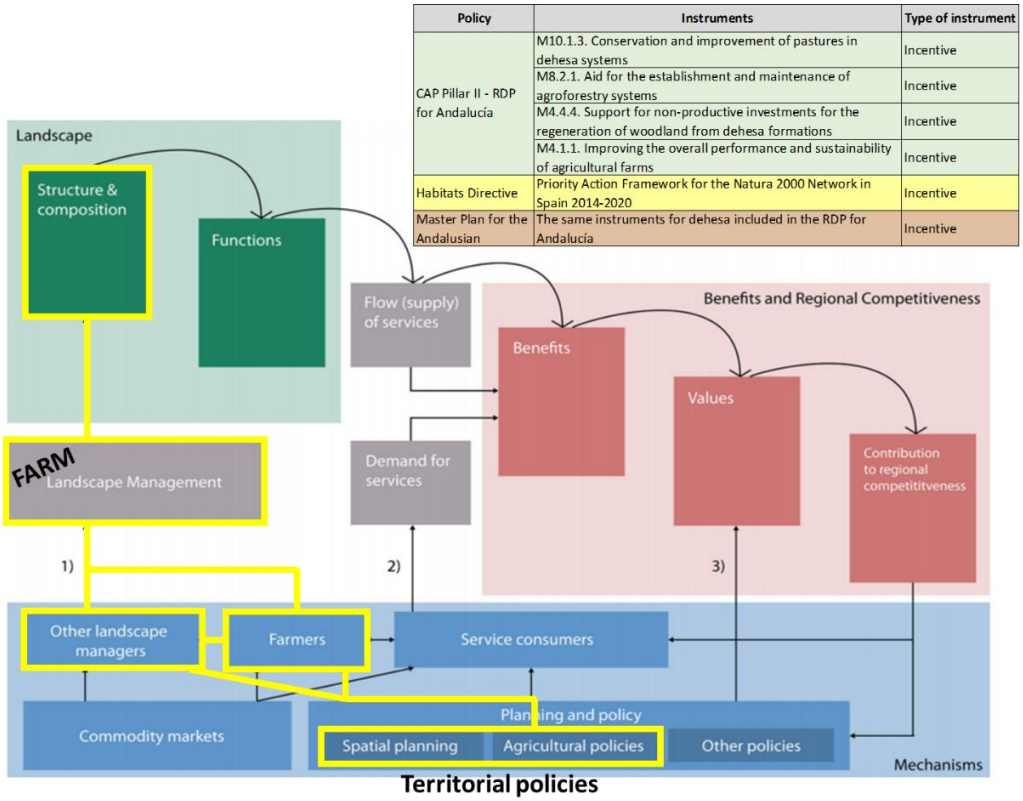
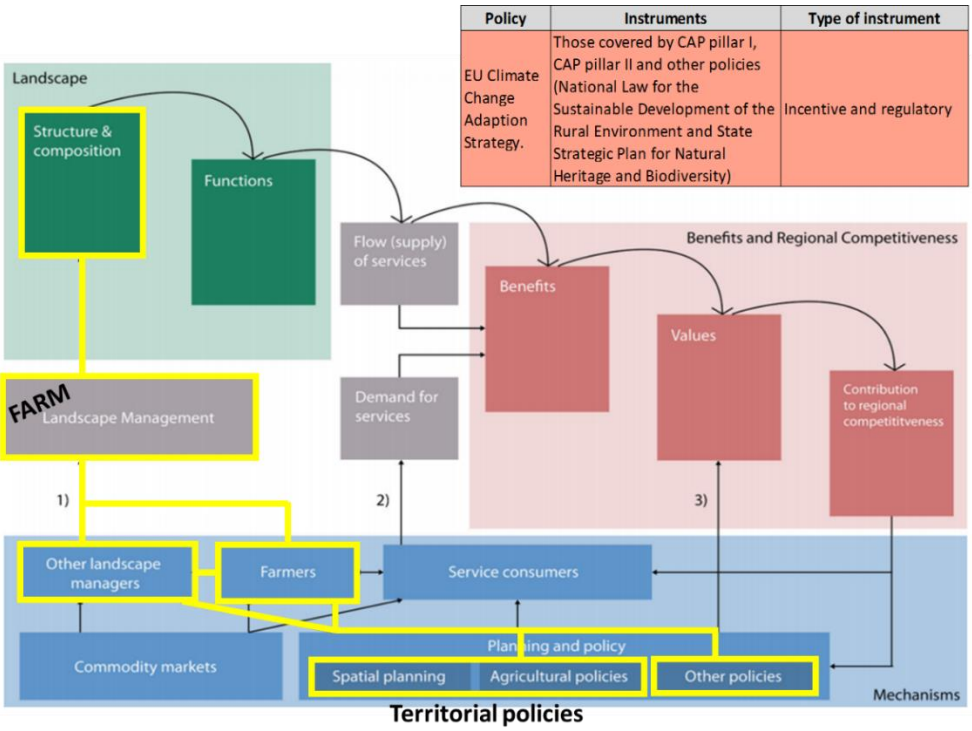


Figure 33. Diagram of policy logic for territorial and other policies in Spain.



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4.2.2.6 Stakeholders understanding of policy effectiveness

4.2.2.6.1 Data collection

The next phase consisted of carrying out an assessment of the effectiveness of the policies and instruments previously identified. This phase was conducted using data from primary information sources through interviews with ten stakeholders. The type of stakeholder/interest group, the number of experts and the entities to which they belong are shown in Table 12.

Table 12. Entities and number of experts selected by interest group

Stakeholder/Collective	Entities and number of experts
Institutional/Administration Scope	2 technicians from the Department of Agriculture, Food, Fisheries and Rural Development of Andalucía
Environmental organizations	1 WWF technician 1 representative of ECOVALIA/FEDEHESA
Agricultural organizations	1 ASAJA technician 1 COAG technician
Teaching and research areas	1 researcher from IFAPA 1 professor from UCO
Specific interests (producers of Iberian pork, sheep and/or cows)	1 farmer (owner of dehesa and producer of Iberian pork) 1 technician from a Rural Development Group belonging to a territory whose surface is mainly occupied by dehesa.

The interviews were carried out in person, arranging an appointment with each of the interviewees at their usual place of work. Table 13 shows the details regarding the conduct of the interviews.

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Table 13. Details of the interviews conducted: group, place, date and duration.

Nº	Group	Place	Date	Duration
1	Research area	Pozoblanco (Córdoba)	03-06-2019	56 min
2	Specific interests	Córdoba	05-06-2019	1 h 9 min
3	Administration	Sevilla	06-06-2019	1 h 10 min
4	Specific interests	Dos Torres (Córdoba)	10-06-2019	1 h 49 min
5	Environmental organization	Córdoba	12-06-2019	1 h 21 min
6	Agricultural organization	Sevilla	13-06-2019	1 h 12 min
7	Administration	Sevilla	13-06-2019	2 h
8	Environmental organization	Córdoba	18-06-2019	1 h 43 min
9	Agricultural organization	Sevilla	01-07-2019	1 h 20 min
10	Teaching area	Córdoba	25-07-2019	2 h 30 min
			Total	15 h 10 min

In order for the participants to have a formed opinion of the objective of the interviews, the following documentation was sent to them beforehand: i) information letter about the SUPER-*G* project in general and wp4 in particular; ii) semi-structured interview protocol; iii) specific questionnaire; iv) summary of the policies and instruments to be analysed (Table 11).

At the time of the interview, the participants signed the consent form developed in the context of the SUPER-*G* Project. All but one of the interviewees gave their consent to record the interview.

4.2.2.6.2 Key messages

A. Assessment of the provision of ES provided by the permanent grasslands of the dehesa

In the Project report, the section "1.3 Concept and methodology of SUPER-*G*" identifies the following main ES provided by PGs: (i) biodiversity; (ii) pollination; (iii) carbon sequestration and reduction of greenhouse gas emissions; (iv) flood control and soil erosion; (v) water quality; (vi) tourism and recreation; (vii) livestock feed; and (viii) biomass production.

In the interviews carried out, the participants were asked to assess the capacity of the PGs to supply each of these ES. From the responses of the interviewees it can be deduced that the ES with the highest level of provision are "cattle feed" and "biodiversity", followed by "pollination", "carbon sequestration and reduction of greenhouse gas emissions" and "control of floods and soil erosion".

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Finally, with a lower level of provision are "improvement of water quality", "tourism and recreation" and "fodder for biomass and other products".

In addition to these generic ES, interviewees have valued others more specific to the dehesa, such as "fixation of the rural population", "fire prevention", "provision of quality food" and "landscape".

B. Main problems and barriers for the provision of ES supplied by the PGs of the dehesa

Through the interviews, it was also possible to identify the main problems that currently put at risk or impede the continuity of supply of each ES. Based on the answers provided, the ten most frequently mentioned environmental, institutional, socioeconomic and research barriers were:

- Simplification and degradation of ecosystems resulting from inadequate management: elimination of shrub stratum and riverside vegetation; lack of shelter and water points for wildlife; depletion of pasture and decline in quality; disappearance of trees; changes in use resulting from the disappearance of trees towards other intensive agricultural uses.

- The CAP does not provide payment for ES supply by production systems, so extensive systems receive less aid than intensive systems.

- Consumers do not value products from extensive farming enough, which means that they do not achieve higher prices on the market.

- Lack of adaptation of policies to extensive livestock farming and the particularities of the different PGs. Policies such as the CAP are too generalist and are often designed with intensive livestock farming in mind, so they are not adapted to the reality of extensive livestock farming and the conservation of PGs. Each type of PG is different, and the same measures are not adequate to respond to their different problems.

- Imbalances in the ecosystem due, among other things, to the increased incidence of forest pests and diseases or the proliferation of invasive species.

- Interference between livestock and wildlife, disease transmission, competition for available resources, etc.

- Loss of soil fertility, erosion, compaction, reduced capacity to retain water, etc.

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- Climate change and dependence on climate, increased temperatures, frequency of droughts, etc.
- Excessive administrative bureaucracy, application for permits, carrying out controls, complexity of applying for aid, etc.
- Lack of applied research and technology transfer to the sector on the management of PGs in the Andalusian dehesa.

According to the interviewees, the main consequences of all these problems include the low profitability of farms and the intensification or abandonment of livestock farming. These problems and consequences are in line with the challenges previously identified in section 1.5 of the document.

The analysis carried out independently in each group shows the main problems that each interest group highlights as the most important. In such a way that:

- In the area of administration, the main points are “simplification and degradation of ecosystems as a result of inadequate management” and “lack of adaptation of policies to extensive livestock farming and the particularities of the different PGs”.
- Environmental organisations point to "poor profitability" and "intensification of production".
- Agricultural organisations mainly point to “imbalances in the ecosystem resulting from the incidence of pests, diseases, proliferation of invasive species”, etc. as well as 'poor profitability of farms”, “lack of adaptation of public policies' and 'poor consumer appreciation of products from extensive livestock farming”.
- In the teaching and research area, the "simplification and degradation of ecosystems as a result of inadequate management" and "climate change" were highlighted.
- In the area of specific interests, "simplification and degradation of ecosystems as a result of inadequate management" was again pointed out, as well as "loss of soil fertility, erosion, etc.".

Finally, in a comparative analysis of the vision of the different collectives on which are the main problems for the provision of ES, the results show a high level of consensus between the environmental organizations and the agrarian organizations, and between the latter and the administration.

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C. Relevance analysis

In order to analyse the relevance of the different policies that affect PGs and the provision of ES, interviewees were asked to assess the extent to which the objectives of these policies were designed to solve previously identified problems.

Regarding the **first pillar of the CAP**, most interviewees (approximately 60% of them) consider that the objectives of this policy do not respond to the problems of PGs. The most critical groups in this respect are environmental organizations and agrarian organizations. The main reasons given are the following:

- The policy has been designed in a very generic way, without taking into account the specificities of different agroecosystems such as that of the dehesa.
- Payments for ES have not been included. Other productive systems provide less ES and receive more subsidies.
- Management requirements have been established that do not adjust to the reality of the agroecosystem, such as, for example, the application of the reference ratio of permanent pasture or the requirement for very short rotation periods in the case of pastures with arable land (every 5 years).
- The policy has not been designed following a logical framework, carrying out coherent planning on the basis of a prior diagnosis, formulation of objectives and establishment of indicators.
- Historical rights make it difficult for new farmers to join agri-environment schemes, favour the most intensive farms and do not provide sufficient support for those located in areas of high natural value.
- It is under continuous review, but it is hoped that solutions to these problems will be included in the next planning framework.

Interviewees who do consider that the policy objectives respond in a general way to the main problems that have been previously identified, acknowledge some of these shortcomings in the design, but point out that, although aid is insufficient, it contributes to maintaining the profitability of

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farms. They also point out that the problem that has been most taken into account in the design of the policy has been the prevention of abandonment of agricultural activity.

In relation to the **second pillar of the CAP (RDP for Andalucía)**, the interviewees consider that the objectives of this policy do respond to the main problems affecting the pastureland (approximately 62% of them). The groups that most support this opinion are the Administration, the Rural Development Group and the teaching and research sector. The most critical groups in this respect are agricultural organisations and especially environmental organisations.

The main reason that the groups use to argue that the problems have been taken into account in the design of the objectives is that the second pillar is more flexible than the first, it allows for the elaboration of specific instruments for the dehesa and, therefore, it can be better adapted to the specific problems that this agroecosystem presents. However, despite this flexibility, they also point out that the EAFRD regulation itself has prevented the development of measures that would be even better suited to the resolution of specific problems, such as the maintenance of agroforestry systems.

The main reason cited by the environmental group to argue that the problems had not been taken into account in the design of the objectives was that the second pillar had not been designed following a real logical framework. The measures to be financed, however, were defined beforehand, especially those that favoured the agro-industry, and the need for the measures was then justified. They also state that the measures included in the second pillar suffer from a lack of coherence between themselves and with what other policies and directives indicate.

Finally, **other policies** such as the Dehesa Master Plan, the Habitat Directive, the Nitrates Directive and the Climate Change Adaptation Strategy were also analysed by the interviewees. According to the criteria of the participants, the objectives of these policies have been designed in a general way taking into account the problems that affect the provision of ES by PGs. However, they point out that their main limitation is that they do not have their own financing instruments, but that the actions contemplated in them are carried out directly or indirectly with CAP resources (generally from the second pillar), as is the case of the Dehesa Master Plan.

D. Analysis of democracy

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In order to analyse the democracy of the different policies that have an impact on PGs and the provision of ES, interviewees were asked to assess the extent to which the different collectives have participated in their design and implementation.

In relation to the **first pillar of the CAP**, the interviewees consider that they have generally not participated in the design of this policy, and that they do not know whether other entities belonging to their groups have done so. All agree that this was a rigid policy that does not allow for major changes. Among the groups that have participated in one way or another, those of the Administration, environmental organisations and one of the agricultural organisations stand out. Their participation has been mainly through the regulated processes of reviewing documents and sending allegations. The experts who have participated in the design of this policy have evaluated their level of participation as medium-high.

In relation to the **second pillar of the CAP RDP for Andalucía)**, the interviewees consider that in general all the entities have participated in the design of this policy or are aware that other entities of their collective have done so. The most common form of participation has been through the establishment of ad-hoc partnerships, the review of documents and the preparation of proposals, suggestions, allegations, etc. Sometimes technical consultations are made directly to a specific group (usually in the field of research) for the design of a specific measure. In general, the interviewees have evaluated the degree of participation as medium-high.

In this sense, it is important to point out that the administration argued that all interested groups have been able to participate in the design of this policy through the Participation Commissions and that its convocation, by the EAFRD management authority, is obligatory and its procedure is officially established following EU guidelines.

The WWF organisation wanted to state that the environmental administration should have more participation in the design of the measures, as well as the environmental organisations themselves, as they were only able to review and give their opinion on the measures that were of an environmental nature, but not on the rest. In general, they think that the processes of participation in the design of RDPs in Spain have not been carried out correctly, which is why at the time they submitted a letter signed by more than 50 organisations to the European Commission.

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In addition to participating in the policy design phase, some of the entities interviewed have participated as beneficiaries in the implementation phase of some of the RDP instruments. This is the case of the owner of the dehesa/producer of Iberian pigs, who receives aid from the CAP. There are also experts from the teaching and research sectors, who participate through operational groups in measure 16 "Cooperation". Likewise, the Rural Development Group participates in several operational groups and finances rural development actions through the LEADER measure. The agricultural organisations, through their partners, know the degree of implementation of the measures, and make suggestions on the development of the same to the administration.

Finally, in the field of **other policies** such as the Dehesa Master Plan, the Habitat Directive, the Nitrates Directive and the Climate Change Adaptation Strategy, most of those interviewed stated that they had participated in their design, especially in the Dehesa Master Plan. Participation in the design of these policies is usually carried out through meetings and working groups created specifically for this purpose and through the review of draft documents. Both the agrarian and environmental administrations usually make technical queries to a specific group, usually related to research, for the design or transposition into Spanish and Andalusian legislation these policies.

E. Legitimacy analysis

In order to analyse the legitimacy of the different policies that have incidence on PGs and the provision of ES, the interviewees were asked to comment on the main needs or demands of their collective regarding the management of this agroecosystem, and to assess the extent to which the policy objectives have been designed taking them into account.

In relation to the **first pillar of the CAP**, five of the interviewees consider that the demands and needs of their group have not been included in the design of the policy; one of the interviewees believes that they have, and the other four have not made any pronouncements in this regard. Among those who replied negatively were the environmental organisations, one of the agricultural organisations and both entities included in the group of specific interests. In general, they argue that, although the Administration collects their demands through the processes of participation, these are not reflected in the design of the policy. In the opinion of these groups, the policy focuses on and benefits intensive rather than extensive production systems.

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The interviewee who thinks that in general their demands have been taken into account is one of the agricultural organizations, while those who did not answer this question were the participants of the Administration and the researchers/teachers. They preferred not to answer because they did not participate in the design of this particular policy.

In relation to the **second pillar of the CAP (RDP for Andalucía)**, eight of the ten interviewees considered that their needs and interests had been included, to a greater or lesser degree, in the design of this policy. In this sense, the agricultural organisations and the teaching and research sector believe that some of their contributions and needs were taken into account, although not all of them. The Iberian dehesa/pork farm owner considered that his specific interests (mainly the economic and environmental maintenance of the dehesa farms) were included in the design of the second pillar, albeit to a very low degree.

The two interviewees who replied negatively were the representatives of the environmental organisations. They consider that their needs and interests related to the preservation of PGs and extensive livestock have not been included in the design of the policy. They believe that traditional agrarian organizations have more influence than NGOs.

Finally, the Agricultural Administration argued that it is a public service institution, which works for the benefit of the sector. The policies have been designed with the maximum interest of all groups, but it is not possible to meet all the needs of a specific group since doing so may harm another group. On the other hand, sometimes it is not possible for them to put into practice the best solution to design instruments or measures better adapted to a specific reality because, in many cases, the solutions do not conform to European regulations.

In relation to **other policies**, most of the interviewees consider that their interests and needs have been included in the design of these policies, above all in that of the Master Plan for the Andalusian Dehesas. Specifically, the research sector points out that in this policy the objectives related to research applied to the management and conservation of PGs and the transfer of knowledge have been taken into account.

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F. Effectiveness analysis

In order to analyse effectiveness, interviewees were asked to assess whether the objectives of the policy instruments are being achieved, and whether they are contributing to maintaining or increasing the flow of ES provided by the PGs of the dehesa.

In relation to the **first pillar of the CAP**, the interviewees assessed the effectiveness of the basic payment, greening and additional payment as follows:

- The objective of the "basic payment" is to guarantee a minimum income to farmers, and based on this, five of the interviewees considered that this instrument is being moderately effective; two considered that it is not being effective; and three did not respond to this question. This was because they do not have enough information to be able to make an assessment. Those who consider that the instrument is being effective argue that, despite its deficiencies (generality and lack of specificity, support for more intensive production systems, etc.), the reality is that it is a regular, predictable and constant aid that contributes to the maintenance of agricultural activity, since without it, it would be difficult for the pastures to survive. The representatives of environmental organisations considered that the objectives were not achieved, mainly because the payments were clearly in favour of intensive systems as opposed to extensive livestock farms whose territorial base is PGs.

- Based on the specific objective of “greening”, five interviewees felt that this instrument is being effective; one interviewee felt that it is not being effective; and four interviewees have not made any pronouncements in this regard. Those who consider that the instrument is being effective argue that the incorporation of the criterion of maintenance of PGs on the farm among the three that are mandatory in order to receive this aid compensates in some way the lack of market remuneration for the provision made of public goods and ES. The interviewee who believes that this instrument is not being effective gives the same reasons as indicated previously in the explanation of basic payment.

- Based on the specific objective of "additional payment", six interviewees felt that this instrument was effective; one interviewee felt that it is not being effective; and three interviewees did not pronounce on this issue. Those who thought that the instrument was effective argued that coupled support for cattle, sheep and goats was helping to retain a vulnerable sector. The interviewee who

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believed that this instrument was not effective gave the same reasons as indicated previously in the explanation of basic payment.

On the other hand, the experts assessed the contribution of each of the three instruments to the maintenance of the ES supplied by the PGs as follows:

- The basic payment mainly contributes to the provision of the following ES: "animal welfare", "quality food", "fire prevention", and "long-term permanence of the system".

- Greening mainly contributes to the provision of the following ES: "animal welfare", "quality food", "fire prevention", "long-term permanence of the system", "improvement of soil quality" and "contribution to the equilibrium of the ecosystem".

- The additional payment contributes mainly to the provision of the following ES: "animal welfare", "quality food", "fire prevention", "contribution to the equilibrium of the ecosystem", "long-term permanence of the system", and "improvement of soil quality".

In relation to the **second pillar of the CAP (RDP for Andalucía)**, the interviewees assessed the effectiveness of the main measures affecting the dehesa as follows:

- *M10.1.3 "Conservation and improvement of pastures in dehesa systems"*. Six of the interviewees considered that this instrument was effective; two of the interviewees consider that it was not; and two made no pronouncements in this respect. The main positive and negative reasons offered by the interviewees for this assessment were the following: i) it is a well-designed measure, although with some weaknesses, especially in relation to the lack of information for its effective implementation, which has created some misinterpretations; ii) there is a delay in the calls for aid, its resolution and the collection of amounts; iii) the measure is of recent application, so there is a lack of sufficient information to make a full assessment of its effectiveness; iv) it has not had the expected acceptance, possibly because it has been designed in an experimental way (only applicable to a part of the surface of the farm) and has been able to discourage some owners of pastures; v) the implementation of this measure is an achievement in itself since there are no precedents in the design and implementation of measures such as this in previous programming periods.

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- *M8.2.1 "Aid for the establishment and maintenance of agroforestry systems" and M.4.4.4 "Support for non-productive investments for the regeneration of woodland from dehesa formations".* These measures have been dealt with jointly because they are two complementary measures designed to promote the regeneration of woodland in the dehesa. However, the interviewees were unable to assess the effectiveness of these measures because they have not yet been convened. For this reason, all the interviewees have serious doubts that the objectives, initially planned when they were designed, can be achieved.

- *M4.1.1 "Improving the overall performance and sustainability of agricultural farms".* Four of the interviewees considered that this instrument was effective to a medium-high degree; three believed that it was not effective; and three others have not made any pronouncements in this regard. The interviewees who foresee that this instrument will achieve its objectives based this on the fact that the calls for aid have already been successful and are only pending payment. Those who take the opposite view base themselves on this to predict the lack of effectiveness of this instrument, the delay in the payment of aid, and the scarcity of funds with which it has been endowed.

The experts assessed the contribution of one of the instruments to the maintenance of the ES provided by the PGs as follows:

- M10.1.3 contributes mainly to the provision of the following ES: "Landscape conservation", "population fixation", "production of pasture for livestock feed".

In addition to these instruments that have been specifically designed for the dehesa in the context of the RDP for Andalucía, some of the interviewees have provided information on the effectiveness of other measures that are widely applied, both in dehesa farms and in other types of farms. This is the case of instruments M10.1.1 "Beekeeping for the conservation of biodiversity", M10.1.2 "Maintenance of autochthonous breeds", M11 "Ecological agriculture", M13 "Payments to areas with natural or other specific limitations" and M.16 "Cooperation". In general, the assessment of the effectiveness of these measures is positive, although some of the interviewees highlight the budget under-allocation associated with some of them.

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G. Efficiency analysis

In order to analyse efficiency, interviewees were asked to assess the adequacy of the budget allocated to each instrument to achieve its objectives. The interviewees focused mainly on the budget of the second pillar of the CAP (RDP for Andalucía).

In this sense, five of the interviewees considered that the budget of the policy is not adequate; four of them considered that it was; and one did not pronounce on this matter. Those who consider that the budget is adequate argue that this is a fully justified expenditure as each instrument is designed to meet at least one of the needs identified in the ex-ante evaluation of the RDP. It is also an expenditure that is approved by the European Commission, which has verification systems to ensure that the budget is spent according to guidelines laid down in each of the measures. Therefore, in the opinion of several of the interviewees, the expenditure can be qualified as appropriate as it complies with the rules of the EAFRD regulation currently in force.

Despite this, this group of interviewees also acknowledge some budget deficiencies. These are mainly deficiencies in the distribution and access of funds between large and small farms (where the first benefit as opposed to the second) and in the lack of implementation of some measures that have been previously endowed with a budget that is not finally executed.

In addition to these deficiencies, the group of interviewees who consider that the policy budget is not adequate adds others such as the following: i) the budget of the first pillar of the CAP is too high compared to that allocated to the second pillar; ii) the budget allocated to the second pillar is insufficient to address the objectives of this and other policies that do not have financial instruments and depend directly on EAFRD funds (policies such as the Master Plan for the Andalusian Dehesas, the Habitat Directive, etc.).); (iii) measures specifically aimed at the dehesa (M10.1.3, M8.2.1, M.4, M8.2.3, M8.2.3, M8.2.4)..1.1, M 4.4.4), and others which have an impact on PGs, are economically underfunded compared to other measures under the second pillar of the CAP.

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H. Impact

To analyse the impact of policies, interviewees were asked to assess two questions, first, whether they consider the effects of the policy are being measured and, second, whether the overall policy objectives are being achieved through the implementation of each of the policy instruments.

In relation to the first question, government interviewees argue that all policy measures have a battery of official indicators to measure the effects of their implementation and the degree of execution of the proposed objective. However, the rest of the interviewees consider that most of these official indicators focus on issues within the scope of implementation (e.g. number of applications made, area covered by aid, number of indigenous livestock, etc.) but are not sufficient to measure other much more important effects such as biodiversity or an increase in the provision of ES. In this sense, some of the interviewees point out that there are bodies, including the administration itself (such as the environmental administration), that monitor ecosystems through indicators, and that they could use these data to carry out a comprehensive evaluation of the effects of policies.

Concerning the second issue, in the analysis of the **first pillar instruments of the CAP**, six of the interviewees considered that the three instruments covered by the analysis are contributing to the achievement of the general policy objectives; one of them considered that they are not achieving them, and three others did not express an opinion on the issue. Of the three instruments, the interviewees considered that the one that is contributing most to the achievement of the objectives of the first pillar of the CAP is the additional payment, followed by greening and finally the basic payment.

In the analysis of the instruments of the second pillar of the CAP (RDP for Andalucía), instruments M8.2.1 and M4.4.4 could not be evaluated by the interviewees because they have not yet been implemented. In the case of instrument M10.1.3, seven of the interviewees consider that it is contributing to achieving the objectives of rural development policy, although it does so to a medium-low degree, one of the interviewees considers that it is not contributing, and two have not made any pronouncements in this regard. As for instrument M4.1.1, three of the interviewees consider that it is contributing to the achievement of the general objectives of the policy, and does so to a medium-high degree, two consider that it is not contributing, and five have preferred not to answer this question.

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I. Unexpected consequences

The experts were asked to assess the unexpected effects on PGs as a result of policy implementation. In this regard, the interviewees highlighted the following two negative consequences:

- Cessation of the regeneration of the trees and shrubs of the dehesa as a consequence of the requirements established for the calculation of the reference ratio of permanent pasture. Wooded areas have not been considered eligible for aid, so the pastures have suffered a reduction in income. Thus, the dehesa farms which have received the highest amounts of aid are those without trees and bushes and which carry out tillage, i.e. the simplest ecosystem with the least provision of ES.
- Generation of expectations that have not been fulfilled in the end. The design of specific measures for the dehesas and their incorporation for the first time in the RDP for Andalucía generated important expectations in the sector, but the delay in the call for aid under measure M10.1.3, and the absence of calls for aid under measures M8.2.1 and M.4.4.4, have generated rejection and disillusionment among the actors involved in the management of the dehesas.

Other negative effects pointed out by some of the interviewees are the following:

- Reduction of farmers' incomes due to the time elapsing between the application for aid and the resolution of their dossier. Farmers apply for them; start implementing the measures; wait for payment; and then their application is declined.

- Disappearance of farms and cessation of activity, especially of sheep farming. The policy has encouraged beef production over goats or sheep, resulting in Appearance of cattle farms on land traditionally used for sheep.

- Intensification of livestock production.

- Despite policy support for the promotion of generational change, the sector remains unattractive to young people.

Finally, a positive unexpected consequence that was highlighted by one of the interviewees was the emergence of an operational research group aimed at improving pastures in the dehesa through

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native pratense species. This group arose as a consequence of the shortcomings detected in this area during the design of pasture measures in the RDP.

J. Proposed *changes*

Interviewees highlighted a series of proposals for changes in dehesas, which can be summarised in the following points:

On policy design

- To elaborate a common methodological guide at state level and approved or supervised by the European Commission to identify and characterize High Natural Value Systems (HNVS) such as the pasture.
- Elaborate specific regulations for extensive livestock farming and for PGs.
- Improve the coherence between the aids that converge in the dehesa.
- Enable a payment that compensates for the ES generated by the dehesa ecosystem.
- Move towards a direct payments model that supports the production of public goods and is not based on historical rights, which leaves HNVS out of the picture.
- Redefinition of scoring scales for access to second pillar aid to give priority to the groups that need it most, such as young people, women, etc.
- The characteristic complexity of these systems makes it difficult to design specific agri-environmental support, and requires a broader approach to respond to their challenges and needs. For this reason, territorial contracts may be an ideal figure to work on their conservation. These contracts are signed between the Administration and each farmer/livestock producer individually establishing the environmental and socioeconomic objectives to be achieved on each farm and the necessary actions to achieve them.

On the participation of interested groups in the design of policies.

- Fulfilment of the Decalogue of the "Golden Rules of Participation" of the Rural Action Forum and creation of a "State Table of the Rural Environment". This Table should provide information on

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crucial issues for the territory and the rural population, allowing for debate on legislative proposals and consultation and exchange of views on the impact of the application of policies in the rural environment (including the existing links between both pillars of the CAP, environmental legislation, territorial planning, etc.). It would be constituted by the representative entities of the civil society, the competent public administrations in the state, with autonomic and local scope, and experts in the matter.

On the budget of the policy:

- Design of a balanced budget between the two pillars of the CAP, eliminating the possibility of transferring funds from the second to the first pillar, and ensuring that at least 50% of the budget is directed towards environmental objectives, explicitly and measurably supporting the HNVS.

On the follow-up, monitoring and evaluation of the policy

- Improve the follow-up and evaluation of CAP performance through the establishment of common frameworks around monitoring. It is therefore necessary to have indicators that are capable of measuring (through big data, artificial intelligence, digitisation, etc.) aspects related to biodiversity and the provision of ES.

- It would be desirable to have more information on the positive and negative effects of the implementation of CAP measures on PGs and their level of acceptance among farmers in order to improve advice and training in the sector.

On research and knowledge transfer:

- Improve the farmer's training in pasture management.

- Promote more applied research and knowledge transfer to the sector, especially in the field of new technologies of transformation and digitisation.

Other comments that the interviewees wished to add:

- Although the CAP is often heavily criticised, we would have to assess what the sector would be like if it did not exist.

- In general, policies and instruments are well designed, but implementation fails.

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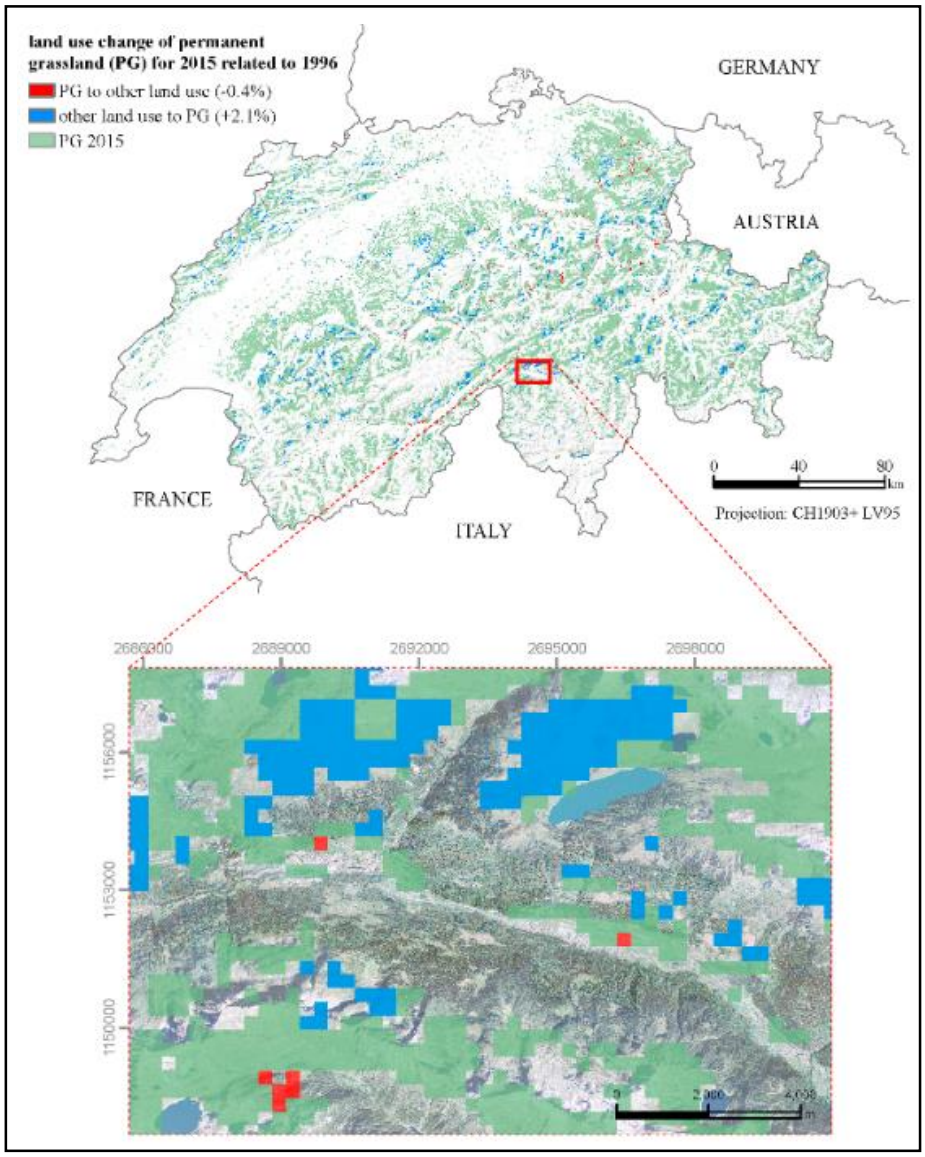
4.2.3 Switzerland – Alpine BGR

4.2.3.1 Characteristics and distribution of permanent grassland in Switzerland

The total area of Switzerland is 41.290 km2. Of this, 11.600 km^2 (i.e. approx. 28%) are PGs. In total, all grasslands cover 60-70% of the country's land. In a study that used a similar definition of PGs to the one adopted in the SUPER-*G* project, Schmidt et al. (2018) show that PG areas have increased by 1.7% in Switzerland between 1996 and 2015. This was the net result of a combination of conversions of PGs into other land uses (–0.4%) and an increase because of conversion from other land uses to PG (+2.1%) over the two decades. The resulting map is presented in Figure 34:

Figure 34. Map of PGs in Switzerland.



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A large proportion of PGs are used for grazing livestock. The majority of farms (60% in 2013) specialise in **grazing livestock** (FSO). In 2018, most of the farmland was made up of **natural meadows and pastures** (607.500 ha, or **58%** of the utilised agricultural area - UAA). There has been a 10% decline in 10 years in the number of dairy cows (564.000 units in 2018). On the other hand, the production of beef, particularly of suckler cows, has registered a steady increase (125.454 cows in 2018). This trend is attributable to the leap forward in organic farming in Switzerland: in 2018, biological standards were applied by 7.032 producers, i.e. 4.9% compared to the previous year, for a total growing area of 161.000 hectares, that is approx. 15% of total UAA. The proportion of organically managed UAA ranged between 4% in Cantons Geneva and Schaffhausen, and 57% in Canton Graubünden (Grisons). Farms that comply with these standards hold over a quarter of the cattle for breeding.

In general, the number of farms is decreasing, while the average size is increasing in the country. According to the latest farm structure census 2018 (FSO, 2019), **50.852 farms** were surveyed, which is 768 fewer than in 2017 (–1.5%). This decline continued at a similar rate to the previous year (–1.2%). Swiss farmers utilised approx. 25% of the country's territory, i.e. an **UAA of 1.04 million hectares** and employed 152.400 people. However, the agriculture sector accounts for less than 1% of the country's Gross Domestic Product (GDP) (EAER, 2019). In 2018, the average area of farms in Switzerland was 20.5 hectares, which is twice the average observed in 1980 (10.3 ha). The number of farms with more than 30 hectares has increased (+1.6%). Compared to 1980, when farms with over 30 hectares represented 14% of the total UAA, in 2018 this figure stood at 47% (496.100 ha).

In Switzerland, according to Giuliani (2002), private sector non-farmers (i.e. individual landowners and collective bodies, such as corporations) and public authorities (i.e. communes, cantons, federal government) own around 44% of the utilised agricultural surface. On average, farmers have taken over 55% of their actual operating area from their parents and are leasing 40% of their land from third parties, whereas they have purchased only 5% on the free land market.

4.2.3.2 Key challenges or threats

- **Livestock density**: In 2016, average livestock density in the EU reached 0.8 livestock units (LSU) per hectare of agricultural area, ranging from 0.2 in Bulgaria to 3.8 in the Netherlands. Despite the fact that industrial animal production is not possible in Switzerland for different reasons (e.g. animal and water protection laws, maximum limits for animal stock, permit required for construction of livestock buildings) average livestock density approached or surpassed 2 LSU/ha in 2018 in Cantons

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Lucerne (2.13 LSU/ha), Obwalden and Appenzell Innerrhoden (AGRISTAT). More than two-thirds of the turnover in Swiss agriculture is based on the production of milk, meat, eggs and other animal products, which leads to a relatively high livestock density in a small country with an even smaller percentage of non-mountainous land (ca. 30%) where farming is economically feasible.

- **N surplus**: Excessive nitrogen (N) levels are of particular concern in Switzerland. Natural atmospheric levels range from 0.5 to 2.0 kg per hectare per year (FOEN, 2016). In Switzerland actual levels range from 3.0 to 54.0. Pollution from nitrogen oxides (NOx) and ammonia (NH3) are particularly high. Both internationally and in Effect-thresholds in the form of Critical Loads and Critical Levels for nitrogen deposition and ammonia concentrations are defined in the framework of the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP). Both thresholds are exceeded in large parts of Switzerland. In 2010, the nitrogen deposition exceeded the critical loads on more than 90% of all forest sites and on approximately 70% of the (semi-)natural ecosystems (FOEN, 2016)[8]. Elevated nitrogen inputs and altered grazing and/or mowing regimes have a negative effect on nitrogen-sensitive ecosystems due to over-fertilization. Ammonia emissions from agriculture account for about two-thirds, nitrogen oxide emissions from combustion processes to about one-third of the total nitrogen inputs. Air-borne nitrogen pollutants can travel long distances to end up in sensitive aquatic and terrestrial ecosystems – such as forests, species-rich natural pastures and dry grassland, alpine heathland, raised bogs and fens – due to dry and wet deposition. Consequences of the nitrogen overload are nitrogen leaching into the groundwater and changes in biodiversity. According to the 2017 report on the status and trend of Swiss biodiversity by the Federal Office for the Environment (FOEN, 2017), livestock, the spreading of their manure, and use of fertiliser are the biggest contributors. As a consequence of heavy use of soil and increased nitrogen, certain plants – such as dandelion (*Taraxacum officinale*) drive other species away and lead to an overall reduced biodiversity (see below).

- **Overgrazing**: In the alpine summer-*G*razing area, grazing intensity is one of the most important management variables controlling vegetation and ES. In spite of this, grazing intensity is difficult to quantify on large, heterogeneous alpine pastures. Local grazing intensity is strongly determined by natural conditions such as slope of the terrain, forage quality, and distance to sheds and water sources. On farms where strict rotational grazing is practised, Schneider et al. (2013) found a

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negative correlation between grazing intensity and plant species richness. In contrast, ES on summer grazing farms with large pasture plots and free-range grazing were largely dependent on environmental conditions and pasture management[9].

- **Farmland abandonment in mountain areas:** Between 1985 and 2009, the agricultural and alpine agricultural areas shrank by 5.4% (850 km2). While in the lowlands, 80% of the former agricultural area changed to permanent settlement and urban areas, in mountain areas, the overgrowing of alpine agricultural areas by shrubs and forests dominated. According to the latest survey published by the Federal Statistical Office (FSO, 2015), 9.3% of the alpine pastures are overgrown[10]. This leads to forest encroachment as tree seedlings find safer sites in patches of weedy species, as well as loss of grazing potential due to the spread of invasive "abandonment weeds" (Müller-Schärer, 2019)

- **Climate change**: Changes in climate are increasing the frequency and persistency of droughts and floods in Switzerland, particularly in the inner Alpine valleys. In response, Agroscope – the Swiss Confederation's centre of excellence for agricultural research, affiliated with FOAG[11] – is currently investigating and testing the introduction of certain traits of various drought-tolerant grassland plants (e.g. sorghum) as a potential adaptive strategy. Another response strategy consists of renovating or expanding meadow irrigation systems, which however induces certain changes in the composition of the vegetation. Other alternative adaptation strategies for forage-production and livestock farms in the mountain region are contemplated in the CO2 Act[12] (see PAT).

- **Weed infestation**: Weed affects agricultural use of grasslands (Agroscope, 2017). This is especially true on organic farms, which are not allowed to use any herbicides. The number of invasive species is a growing problem (107 invasive plants and animals) and is aided by climate change. Declining winter and spring rainfall coupled with rising temperatures favours many of these species. Weed control can result in long-term improvement (e.g. in swards), and more time-efficient and cost-effective than weed removal once poisonous plants have spread in a meadow. Most common invasive and poisonous plants in Swiss meadows and pastures are:

[11] https://www.agroscope.admin.ch/agroscope/en/home.html
[12] Swiss Confederation, Federal Act No. 641.71 on the Reduction of CO2 Emissions (CO2 Act), 23 Dec. 2011

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- Broad-leaved dock – *Rumex obtusifolius.*
- Creeping bent – *Agrostis stolonifera.*
- Marsh ragwort and common ragwort – *Senecio aquaticus und jacobaea.*
- Stolon stonecrop – *Phedimus stoloniferus.*
- Water voles can also cause major periodic damage on forage-production sites.

- **Biodiversity loss**: As indicated in the abovementioned report on Swiss biodiversity[6], 46% of 10,350 native species (incl. fungi, plants and animals) are already extinct (3%), on the verge of extinction (5%), in danger (11%), vulnerable (17%), or potentially threatened (10%). Public perception of the reality is distorted, with 74% of the Swiss public thinking that the nation's biodiversity is in a good or very good state. The use of fertilizers, livestock manure and herbicides in cultivated lands and pastures are the biggest drivers. While helping to cope with weed infestation (see above), herbicide use also reduces the number of seeds of endangered species in the soil. Messicole plants, i.e. those that hide during the winter and appear in spring such as the Edelweiss, are the most threatened.

4.2.3.3 Brief description of the governance structure and policy context

- **Semi-direct democracy and federalism**: The Swiss Confederation is a semi-direct democracy (representative democracy with strong instruments of direct democracy). In Switzerland, citizens can propose changes to the constitution (popular initiative), or initiate an optional referendum to be held on any law voted by the federal, cantonal parliament and/or municipal legislative body. As such, citizens have more power than in a representative democracy. In addition, Switzerland is a federal country, which means that power is decentralized and the laws are typically implemented at the cantonal and municipal levels. Accordingly, the subnational bodies play a critical role when it comes to the implementation of policies.

- **Multi-functionality of agriculture**: In 1996, the Swiss population approved the introduction of a new article in the Federal Constitution (Article 104)[13] that established the principle of multi-functionality of agriculture. The different objectives assigned to agriculture by the Swiss Constitution are as follows:

  "a. the reliable provision of the population with foodstuffs;

[13] Federal Constitution of the Swiss Confederation (No. 101), 18 April 1999

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b. the conservation of natural resources and the upkeep of the countryside;

c. decentralised population settlement of the country."

The Constitution has thus entrusted the Confederation to support farmers via:

- direct subsidies for a fair and adequate remuneration for the services provided, subject to proof of compliance with ecological requirements;
- economically advantageous incentives to encourage methods of production that are specifically near-natural and respectful of both the environment and livestock;
- legislating on declarations of origin, quality, production methods and processing procedures for foodstuffs;
- protecting the environment against the detrimental effects of the excessive use of fertilisers, chemicals and other auxiliary agents;
- encouraging agricultural research, counselling and education and subsidise investments;
- legislating on the consolidation of agricultural property holdings.

Given the multiple objectives assigned to the agricultural sector by the abovementioned constitutional article, careful use of natural resources such as air, water, soil, biodiversity and landscape is essential in Switzerland. For these purposes, the Confederation provides both funds earmarked for the agricultural sector and general federal funds.

- **Swiss Agricultural Policy (AP)**: Multi-functionality implies that the AP is not only supposed to guarantee farmers' incomes, but also to promote the provision of public goods and to protect the environment from detrimental effects (Potter, 2015). The first steps of Switzerland into this new direction of a multi-functional AP were undertaken in 1993 with the introduction of direct payments for public services and voluntary ecological programmes, based on a cross-compliance system. With the adoption of the Federal Act on Agriculture[14], the Confederation has been mandated to "*create favourable conditions for the production and marketing of agricultural commodities*" and to "*support structural improvement*". The federal authorities promote extensive agriculture and low-intensity grasslands with direct subsidy payments. Such payments are only received if ecological standards are fulfilled (PEP = Proof of Ecological Performance). This system meets the requirements of the Green Box measures of the World Trade Organization (WTO)

[14] Federal Act on Agriculture (No. 910.1). 29 April 1998.

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Agreement on Agriculture (OECD, 1998; El Benni & Lehmann, 2010). The second reform step was the abolishment of state-*G*uaranteed prices and the separation of income and pricing policies. In 2006, Switzerland still belonged to the countries with the highest total domestic support level among all OECD members, even though domestic support fell substantially since the 1990s. By 2007, the cheese market between Switzerland and the EU was liberalized (Mann & Gairing, 2011). In the context of the AP reform of 2011, export subsidies and milk quotas were abolished. Furthermore, tariffs, quotas and market support were reduced and transformed into direct payments (Hirschi et al., 2013). Since the AP cycle 2014 – 2017, the Swiss AP continued with only minor adjustments. Total public expenditures for agriculture amount to approx. CHF 4.2 billion/year, i.e. almost twice the EU average in terms of percentage of GDP (Agristat, 2019). Of this amount, approx. 78% is paid to eligible farms in the form of direct payments and social contributions (FSO). Consultations and negotiations are currently underway for the Swiss AP after 2022.

- **Actions to reduce N emissions**: Both internationally and in Switzerland, it is undisputed that the current situation with respect to the nitrogen input into the environment must be improved. The biggest need for action lies in reducing ammonia emissions from agriculture. In 2009, the Swiss Federal Council defined the goal to reduce ammonia emissions by about 40% and nitrogen oxide emissions by about 50% compared to 2005[15]. In this context, an important share of this target was to be achieved via the AP, but this target is still far from being achieved. Since 2008, the federal authorities have supported low-emission technologies, such as the use of trailing hoses to spread manure to reduce ammonia emissions. However, despite a 10.6% decrease in greenhouse gas emissions registered between 1990 and 2016 in the agricultural sector, mainly due to reduced stocks of cattle and higher production efficiency (FOEN), nitrous oxide emissions remained almost at the same level (6.68 million tonnes CO_2eq) as in 2005 (6.71 Mt CO_2eq) (FOEN, 2019).

- **Actions to curb biodiversity loss in pastures**: To counteract biodiversity (particularly, plant diversity) loss, grassland plants for forage production in Switzerland are sown almost exclusively in mixtures. In the meadows and pastures ecosystem, the combination of different plant species and genotypes brings advantages in terms of higher productivity, disease resistance, nutrient efficiency, and lower proportion of weeds. Several studies have shown the extent of the

[15] Swiss Federal Council. Concept concerning air pollution control measures of the Federal Government. 11 Sept. 2009

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advantages of mixtures over monocultures for both production and the environment (Cardinale et al., 2007). According to the Swiss Seed and Planting Stock Ordinance, responsibility for the variety testing of forage plants lies with Agroscope (2019).

- **Incentives for organic agriculture**: While only 13% of farmed land is used to farm organically (FSO, 2015), the Swiss organic market is well developed, with the highest per capita consumption of organic products in the world. At 6.3%, the market share is also larger than in most other countries. Top-selling products are: eggs (EUR 40.08 million, 20.5% if all eggs sold), fresh bread (EUR 131.67 million, 18.8%), direct marketing and potatoes (EUR 136.38 million, 12.9%) (IFOAM, 2019). Market channels include general retailers (77.9%), specialised retailers (12.5%), direct marketing (5.5%) and other channels (4%). Exports and imports: Data on exports and imports are not publically available. It may be assumed, however, that Switzerland imports a large proportion of the organic products that are consumed in the country. In terms of exports, dairy products play a role. The Swiss Ordinance on Organic Farming[16] regulates the use of the term 'organic' on processed and unprocessed agricultural products, by setting out minimum standards. However, it does not introduce nor recommend any specific label for organic products. Private sector logos such as Bio Suisse[17] and IP-Suisse[18] are widely used.

- **Regional competitiveness**: Farm income has been shrinking over the past few years in Switzerland due mostly to sinking prices for key agricultural commodities, whereas most production costs (i.e. construction, machinery, labour, inputs – such as seed, fertilizer, concentrate, veterinary service etc.) have increased. Consequently, Swiss agriculture is comparatively disadvantaged compared to the situation in neighbouring EU countries. In order to increase or maintain competitiveness, farm size should grow in order to obtain economies of scale. According to some experts[19], larger farms could improve the environment by adopting less intensive, more sustainable farming practices and easier compliance with set aside rules for biodiversity priority areas. However, despite the land consolidation trends observed over the past 40 years (see section 4.2.3.1) the farmland market in Switzerland is structurally dry. The Law on Peasants' Land Rights (LPLR) enacted in 1991[20] with the

[16] Swiss Ordinance on Organic Farming (RS 910.18). Ordinance of the Federal Department of Economic Affairs (EAER) on organic farming (SR 910.181), 22 Sept. 1997
[17] https://www.bio-suisse.ch/
[18] https://www.ipsuisse.ch/
[19] Agroscope. Swiss Land Governance. 2016
[20] Law on Peasants' Land Rights (LPLR)

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aim to protect the structure of Swiss agriculture introduced a ban on fragmentation of parcels and a preferential price for farmland successions and transfers within the family. The OECD recommends changing current inheritance rules that favour intergenerational farming.

- **Clean drinking water and healthy food initiative**: This popular initiative launched in 2018 by Greenpeace Switzerland, Birdlife Switzerland, the Swiss Fishing Federation, etc. aims to cut direct subsidies to farmers who use pesticides or antibiotics. Under the current AP, Swiss farmers receive CHF2.8 billion in subsidies, upon declaring that they meet minimum ecological standards known as 'required ecological services' (e.g. production that encourages biodiversity, respectful animal-rearing, soil rotation, etc.). The initiative, however, calls for pesticide-free agricultural production, and requires that livestock be fed exclusively from fodder produced on the farm. Now, 2,000 tonnes of pesticides are used every year nationwide (85-90% on farms) and 38 tonnes of antibiotics are given to cattle to stop them from falling ill. According to the campaigners, the intensive use of pesticides and antibiotics on farms is contaminating rivers, streams, and groundwater, and is destroying biodiversity. Farmers using prophylactic antibiotics on their animals as a preventive measure or regularly in their production processes would lose agricultural subsidies. The vote on the initiative will be held in May 2020.

4.2.3.4 Details about the specific area of study focus

- **Alpine region**: Because of the multi-functionality of agriculture (see section 4.2.3.3) sustainable land use in the Alpine region is fundamental in order to deal with competing grassland uses and objectives, such as conservation of plant communities and the maintenance of an open landscape. Many alpine pastures are marginal agricultural sites that must be managed with great care in order to maintain valuable forage resources for grazing animals and preserve biodiversity. The type and intensity of grazing is crucial for the composition of the vegetation as well as the services that benefit both people and animals, such as forage production, biodiversity, carbon storage and erosion protection. Structural changes in mountain agriculture continues, with ever fewer farms cultivating ever-larger acreages with an ever-decreasing workforce.

- **Farmland**: 13% of Swiss agricultural land is farmed and managed as extensive and low-intensity meadows and pastures, bedding meadows, fallow strips sown with wild flowers, hedges, and other biodiversity priority areas. In Switzerland, "PG*s enable the provision of high-quality protein from milk and meat which are produced in an environmentally friendly manner on the farm's own feed*

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basis. Grassland also makes a substantial contribution to both the multi-functionality and sustainability of agriculture. Progressive structural and climatic change as well as altered economic framework conditions are confronting the management of PG *with numerous challenges, however*"[21]. In 2017, 85.2% of animal feed have been produced in Switzerland (Agristat, 2019). In order to support grassland-based production with minimum impact on the environment, research is focussing on innovative approaches to advance the sustainable use of the resources of soil, nutrients, biodiversity and water. This includes resource-efficient forage production, the management of swards with limited possible uses, the prevention and control of weed infestation using organic methods, adaptation of grassland use to dry spells, and preservation of ecologically valuable grassland swards in the lowland and mountain areas (Agroscope).

- **Mountain grasslands**: Mountain grasslands are among the most species-rich ecosystems outside the tropics, and have evolved as a result of hundreds of years of extensive agricultural activity that create and maintain open and semi-open habitats below the timberline. Without human interference, most of these habitats would quickly revert to their natural forest state, resulting in a loss of the existing biodiversity. The primary function of these grasslands is to provide fodder for domestic grazing animals. On the other hand, the diversity in landscapes and the species diversity play an increasingly important role in attracting tourists, which creates additional income to mountain regions. With the ongoing intensification of agriculture in the surrounding lowlands, mountain grasslands function increasingly as refuges for species that once were common throughout Europe. Mountain grasslands have important economic, environmental, biological and aesthetic functions. In Switzerland, mountain grasslands (including permanent and temporary grasslands) occupy 940.000 ha, i.e. almost one quarter of the total land area, and are still actively used much more than in the surrounding countries. However, intensification of grassland management near the mountain farms and 'extensified' land use of marginal grasslands further away is a trend that is likely to increase.

- **Lowland pastures:** Ecological compensation meadows and pastures are low-input habitats that play an important role in encouraging biodiversity in the agricultural landscape. In the lowland region, however, the diversity of their flora often fails to meet the ecological targets set by the

[21] Agroscope's Ecological Intensification webpage

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Federal Office for the Environment (FOEN) jointly with the Federal Office of Agriculture (FOAG) in 2008 (see also Table 14).

4.2.3.5 Identifying policies relevant to permanent grassland

4.2.3.5.1 Data collection

For the collection of information about relevant PG policies in Switzerland, the SUPER-*G* team at ETH Zurich used the approach described in Section 3.2 of the SUPER-*G* Codebook[22] (25 March 2019), slightly adjusted as follows:

1. Initial desk research to identify a list of potentially relevant policies at the national level in Switzerland based on their perceived influence on PGs;

2. Delphi consultations with a limited number of SUPER-*G* partners and policy experts to confirm and prioritize policies identified in (1);

3. Consultations with a Blue Ribbon Panel (BRP) of experts to identify and prioritize the most relevant policies of influence to PG management in each case study country.

For the desk research (1), we used Internet search and followed the snowballing technique described in the SUPER-*G* Codebook (Section 3.3.1) to source both official policy documents and implementation reports, position papers, relevant stakeholders and their statements.

For the Delphi exercise, we used the networks and expertise of the Swiss SUPER-*G* team to identify six candidates representing the following organizations:

- Academia (n=2)
- National government: Agriculture, Environment (n=3)
- Cantons/Regional governments (n=1)

Seven additional candidates from the following stakeholder groups were identified:

- Academia (n=1)
- National government (n=2)

[22] ETH Zurich. SUPER-G Codebook. 25 March 2019

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- Regional government (n=1)
- Farmers interests (n=2)
- Public interests (n=2)

Of the identified stakeholder candidates, we held consultations with three BRP experts from academia, farmers and public Interests, respectively.

4.2.3.5.2 Policy mapping

As a result of the abovementioned data collection and consultation efforts, the Swiss team at ETH Zurich finalized the Swiss PAT[23], which describes the main national-level, formal policies and policy instruments intended to protect or benefit Swiss PGs.

The Swiss PAT contains 460 entries describing the following policy-mix of interventions:

- 5 policies:
  - Federal Act on Agriculture
  - Federal Act on Forest
  - Federal Act on the Protection of Nature and Cultural Heritage
  - Federal Act on the Reduction of CO2 Emissions
  - Spatial Planning Act
- 16 policy instruments:
  - 11 incentive instruments
  - 3 regulatory instruments
  - 2 informational instruments

The abovementioned list appears to be broadly in line with the provisions of art. 104 of the Swiss Constitution, in that the identified policies/instrument cover the various aspects of agriculture multi-functionality, namely (i) ensuring the security of the population's supply of quality food; (ii) decentralized occupation and use of the territory; (iii) conservation of natural resources; (iv) maintenance of the rural landscape.

[23] ETH Zurich. Swiss Policy Analysis Table (PAT). 2 May 2019

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Figure 35 provides a visual map of the abovementioned policies. For more details about the scope, objectives and intended/claimed impact of each policy, see Table 16 in section 4.2.3.7.

Figure 35. Swiss policies and policy instruments related to PGs.

SPA	Structure Plans & Land Use Plans	AG-MS	Additional payment for milk used in cheese-making (Cheese processing aid)	AG-DP	Proof of Ecological Performance (PER)	AG-DP	Use and maintenance of summer pastures
NAT	Mires and Mire Landscapes of Outstanding Beauty and National Importance	AG-MS	Additional payment for non-use of silage	AG-DP	Animal-friendly methods of production (BTS), regular outdoor exercise (RAUS)	AG-DP	Difficult farming conditions in hilly areas
FOR	Compensation for deforestation	AG-DP	Biodiversity subsidies: (a) Variety of species and habitats (b) Connecting corridors	AG-DP	Grassland-based milk and meat programme	AG-DP	Use of Alpine pastures
CO2	Climate change adaptation strategy - Livestock farming	AG-DP	Quality of the landscape	AG-DP	Maintaining an open landscape	AG-DP	Difficult farming conditions on steep slopes

Legend: SPA = Spatial Planning Act
NAT = Federal Act on Protection of Nature and Cultural Heritage
FOR = Federal Act on Forest
CO2 = Federal Act on the Reduction of CO2 Emissions
AG = Federal Act on Agriculture
MS = Market Support (Federal Act on Agriculture)
DP = Direct Payments (Federal Act on Agriculture)
BTS = Animal-friendly housing systems

4.2.3.5.3 Policy logic

We used the Cascade Framework as a reference to illustrate the policy logic, i.e. the mechanisms and channels through which policy measures are deployed to generate the expected effects and impacts on the structure, composition and flow of ES and/or on the behaviour of target groups.

Accordingly, the policy logic behind the Swiss policy-mix of interventions described above can be illustrated as follows (see Figure 36, Figure 37 and Figure 38):

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Figure 36. Policy logic followed by non-agricultural Swiss policies (SPA, NAT, FOR).

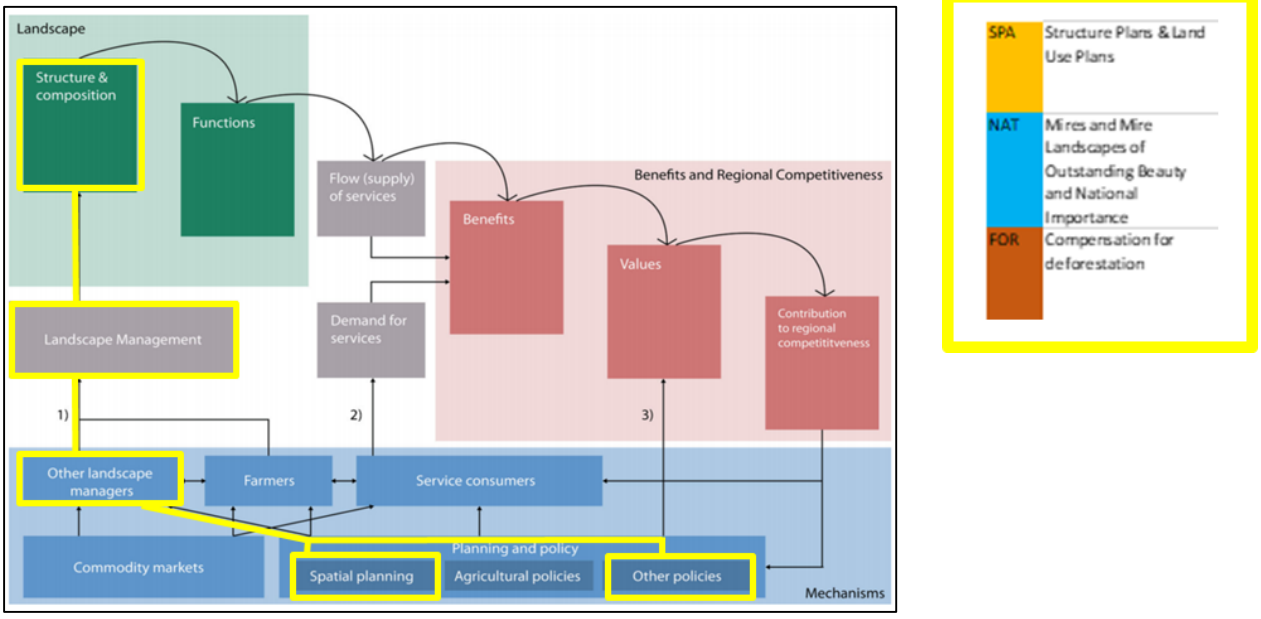

Figure 37. Policy logic followed by six direct payments (incentives) in the Swiss AG.

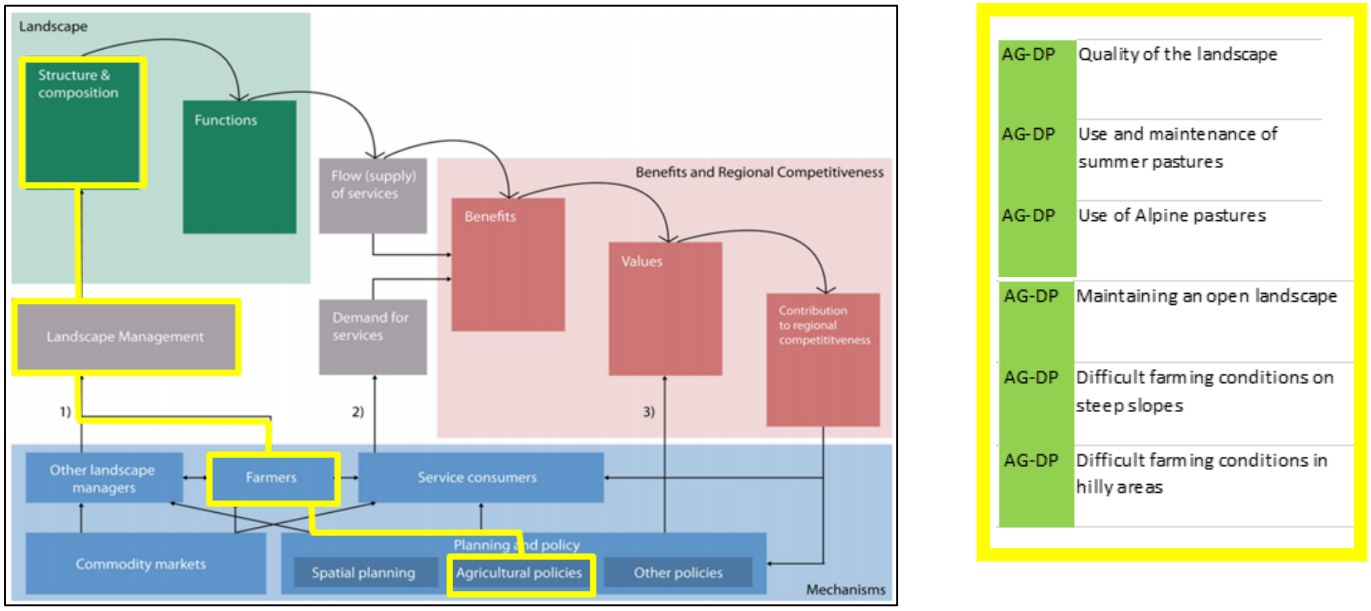

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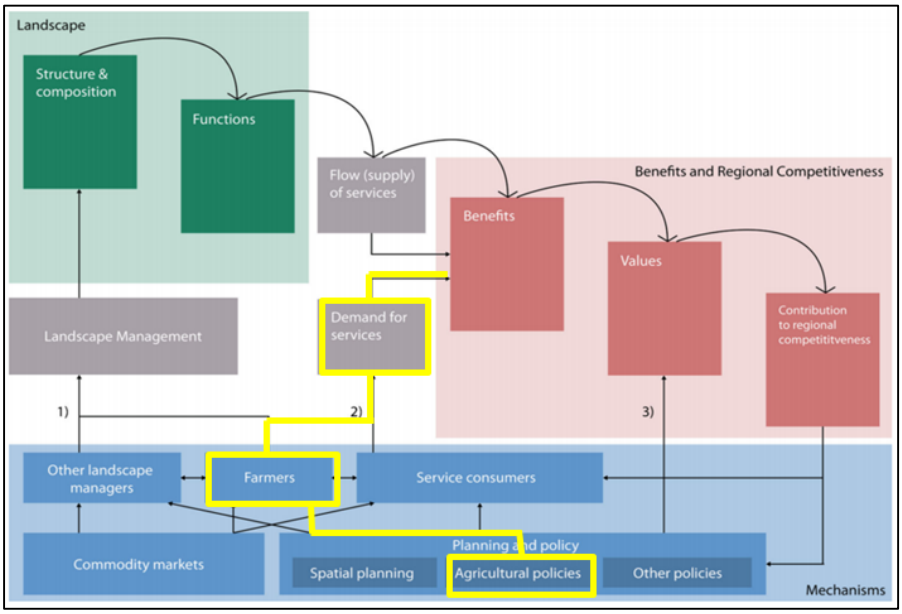
Figure 38. Policy logic followed by five other instruments (MS, DP) in the Swiss AG.



AG-MS	Additional payment for milk used in cheese-making (Cheese processing aid)
AG-MS	Additional payment for non-use of silage
AG-DP	Biodiversity subsidies: (a) Variety species/habitats (b) Connecting corridors
AG-DP	Animal-friendly methods of production (BTS), regular outdoor exercise (RAUS)
AG-DP	Grassland-based milk and meat programme

As illustrated in Figure 36, **Figure** 37 and Figure 38, the majority of policy instruments contained in the Swiss policy mix aims to positively influence PGs by targeting the structure and composition of the landscape (i.e. grasslands themselves within farmlands, or as part of the mosaic of land uses in the area), i.e. at the very top of the cascade.

This is where the three regulatory instruments can be found, alongside six incentive instruments targeting farmers with Alpine pastures and difficult farming conditions in mountain areas.

The remaining five instruments intervene at a lower level of the cascade, namely at the level of the demand for specific types of ES produced by PGs. Since these instruments are all contained in the Federal Act on Agriculture, they target farmers insofar as they can adopt or maintain certain agricultural practices that would induce beneficial effects on grassland ecosystems, and their functions and services. These instruments are designed as economic incentives delivered in the form of either market support (i.e. subsidies for the type of milk used in cheese production and for the non-use of silage) or direct payments (i.e. compensations subject to evidence of ecological performance).

Demand-side policies are missing from the identified policy mix. Demand-side policies are those that intervene at the lowest level of the cascade, i.e. closer to the end beneficiaries of ES. In the context of PGs, such policies could for instance introduce regulations, incentives or information aiming at

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promoting, protecting or rewarding certain specific values associated to PGs (e.g. aesthetical values, cultural values, recreational value, climate regulatory value, biodiversity supporting value, etc.).

To fill this gap, interviews with stakeholders (see section 4.2.3.6) revealed that a number of market-led solutions have emerged in Switzerland over the past few years. This includes two successful organic agriculture labels, such as IP-Suisse and Bio Suisse, as indicated above (see section 4.2.3.3).

4.2.3.6 Stakeholder understanding of policy effectiveness

4.2.3.6.1 Data collection

For the validation of the results of the policy mapping exercise, we interviewed policy experts from different stakeholder groups.

To this effect, we followed the approach and protocol developed and agreed within the SUPER-*G* 4.1c Team (see section 3.4). This included the use of templates – adapted to Switzerland, as needed – for the following products:

- Cover email, Information Sheet, Consent form
- Further Consent Questions
- Standard Interview Questionnaire (mandatory)
- Optional Interview Questionnaire
- Interview Protocol

Following the guidance provided by Task 4.1c coordinators, the list of relevant Swiss policies, and the snowballing technique, we drew up a long list of candidates (n=38) from the following stakeholder groups:

- Academia (n=6)
- National government (n=9)
- Regional government (n=9)
- Farmers interests (n=3)
- Public interests (n=11)

We then shortlisted 10 candidates for the interviews on the basis of (i) suggestions made by Swiss SUPER-*G* team members, (ii) their affiliations in relation to the identified policies, and (iii) their

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knowledge of the subject matter (as deducted from their position, responsibility, information published, and feedback from peers). The selection was validated by the Swiss SUPER-*G* co-PI at ETH Zurich. The shortlisted candidates represent the following stakeholder groups:

- Academia (n=1)
- National government (n=3)
- Regional government (n=2)
- Farmers interests (n=2)
- Public interests (n=2)

The 10 interviews were conducted between 22 May and 23 July 2019. Nine interviewees consented to the use of audio recordings. One interviewee (regional government) preferred to send in written answers to the questions.

4.2.3.6.2 Key messages

A detailed overview of stakeholders' perceptions regarding the relevance, legitimacy, democracy, efficiency and effectiveness of the Swiss PG policy-mix is provided in Table 17 in section 4.2.3.7. The main aspects that emerge from the interviews can be summarized as follows:

- *Relevance*: overall, the identified policy-mix is relevant for PGs. However, there are several other policies that act in the opposite direction by creating negative impacts and competing pressures on PGs. Switzerland would need a dedicated policy for grasslands, given that they represent 60-70% of the country's territory in total. PGs alone cover 28% of the land.

- *Legitimacy*: most stakeholders recognize that in order to promote sustainable PG management, policies should seek to balance production and conservation objectives. Certain ES provided by PGs are well understood and valued by the Swiss population: e.g. attractive and open landscape, biodiversity habitat, regulating services, water purification, etc. However, some of the policies are not satisfactory for all stakeholders, because initial policy intentions have been heavily 'diluted' in the consensus building process and there has been strong lobbying from the agricultural industry (see also Democracy).

- *Democracy*: the intensive consultation process behind law making in Switzerland ensures a broad level of participation and consensus. However, it also offers unbalanced opportunities for powerful

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lobbying groups (e.g. the agricultural industry) to have a strong influence. Initiatives that weaken the farmers and penalize the agricultural industry have little chances of success. A strong debate is currently ongoing over the "Clean drinking water and healthy food" initiative (see above, section 4.2.3.3).

- *Efficiency*: there is no clear-cut evidence that the Swiss support for the agriculture sector is efficient. All stakeholders indicated that it is very costly, and that public spending on agriculture is well above EU average. Some recognize that the system allows for some degree of 'free riding' by certain farmers, who deliberately forego the most responsible farming practices to maximize direct payments or subsidies. Recent official evaluations[24] cast serious doubts over the added value of some incentive payments (e.g. biodiversity compensations), as illustrated in Table 14.

- *Effectiveness*: the overall impression that emerges from the interviews is that the situation is slightly better in terms of expanse of PGs (quantity), but poor in terms of PG qualitative indicators, such as agriculture intensification (increasing) and biodiversity (decreasing). The joint FOAG-FOEN report (2016) recognizes that none of the 13 environmental goals of agriculture set by the Federal Council have been met (see Table 14), and that it is unlikely that any of these issues will be resolved in the next AP cycle (2022-2025).

Table 14. Status of environmental objectives of agriculture, as in the joint FOEN-FOAG report of 2016.

	Environmental Objective of Agriculture	Reached? Y/N	Prospects	Justification (summary)
1	Biodiversity conservation	N	↘	Gradual reduction of biodiversity and of the ES it provides
2	Multifunctional rural landscapes	N	**?**	Loss of agricultural area has decreased. Open landscape subsidies are successful
3	Space reserved for rivers	N	↗	Additional efforts needed to achieve the qualitative objectives
4	Greenhouse gases	N	**?**	Unknown if/when target will be met. It depends on climate strategy
5	Nitrogenous atmospheric pollutants (e.g. ammonia)	N	**?**	Excessive surplus. Without additional measures, the goal will not be achieved.

[24] FOAG-FOEN. Objectifs environnementaux pour l'agriculture. 2016

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6	Diesel soot	N	↗	11-fold surplus. Achievement expected by 2040, if EU measures adopted in 2019
7	Nitrates in water	N	**?**	Unknown if nitrogen inputs of agricultural origin will decline further
8	Phosphorus in lakes	N	↗	Few remaining gaps (e.g. lake Morat, lake Zug). Situation unknown in smaller lakes
9	Pesticides	N	**?**	Unknown if/when target will be met. Action plan needed.
10	Veterinary drugs	N	**?**	No available indicators on health impacts. Antibiotic Resistance Strategy needed
11	Soil pollutants	N	**?**	Unknown if/when target will be met. Effects on human health unknown
12	Soil erosion	N	**?**	Proof of ecological performance is helpful, but there is no national level data
13	Soil compaction	N	**?**	Lack of data. Important to introduce soil protection subsidy in agricultural policy

To summarize, some of the key statements that best illustrate the positions expressed by the various stakeholder groups are presented in Table 15.

Table 15. Key statements made by different stakeholder groups on the Swiss PG policy-mix.

Stakeholder	Key Statements
Nat. Government	• *Unmet environmental quality objectives must be addressed* • *We should impose **sanctions on no compliance**. But politically we have no chance today* • *Impact assessment should be more critical (biodiversity, livestock density)* • ***AG22+: no solution in sight** to reduce livestock density*
Regional Gov't	• ***Environmentally friendly production** should be promoted by law. Change to organic, then less nitrogen, and less production* • ***Food security** is important. If less grass is produced in Switzerland, more fodder must be imported*
Farmers Interests	• *Farmers could potentially be ready to accept **tighter regulations** on **nitrates**, but the costs should not be borne by farmers alone* • *A **holistic view** of the system is missing. Current fragmentation in policies create conflicting goals and trade-offs*

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Public Interests	• *AG policy leads to intensification.* ***Biodiversity subsidies*** *should be improved (e.g. via better PEP). We need more quality* • *We are quite* ***pessimistic*** *about AG22+. The GMF proves that good ideas can be compromised by the lobbying work...*
Academia	• *In the future much more of what the farmers currently receive in the form of direct payments should be covered by the* ***market***

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4.2.3.7 Swiss case study summary tables

Table 16. Summary of the Swiss PAT.

POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
Spatial Planning Act	700	(a) Public authorities (planning concepts, sectorial plans, structure plans); (b) private individuals, landowners, land managers/users, farmers (land use plans)	Structure Plans & Land Use Plans	The countryside must be preserved: (a) sufficient areas of suitable arable land, in particular crop rotation areas, should be reserved for agriculture; (b) settlements, buildings and installations should integrate well into the landscape; (c) lakesides and riverbanks should be kept free and accessible to the public.	N.A.	N.A.	e.g. hectares of land used for agriculture (aim to preserve a minimum contingent of arable soil that is sufficient to guarantee independent food security : 438'560 ha) (Source: Sectorial Plan for Crop Rotation Areas)	"Good but not good enough": although spatial planning in Switzerland is good, it is still in need of improvement. In general, Swiss spatial planning is well positioned in international comparisons. However, it does not meet the high requirements of sustainable development yet. Through major efforts in the last few years, it was possible to improve environmental quality. Air and water quality are very good in international comparisons. The built environment and infrastructure are also largely in good condition. There is no great need for bringing these up-to-date (ARE)
Federal Act on the Protection of Nature and Cultural Heritage	451	Landowners, farm and forest operators	Mires and Mire Landscapes of Outstanding Beauty and National Importance	Protect indigenous flora and fauna, their biological diversity and their natural habitats	N.A.	N.A.	(a) number of landscapes in the national inventory (b) hectares of land (c) richness of biodiversity	In the last 200 years, almost 90 percent of swamps in Switzerland have been destroyed. In 1987, there was the clear approval of the popular initiative «For the protection of the marshes» (Rothenthurm Initiative). The low marshes of national importance are almost 1268. For most of them, an extensive agricultural use is adequate. Alpine skiing and other recreational activities are part of the most frequent uses. The remaining 551 high bogs are all of national importance and

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POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
								enjoy full protection. Intact high bogs do not require any care. However, many are altered by previous uses and therefore require enhancement measures (regeneration). The quality of high bogs and low swamps of national importance is constantly decreasing. This involution is not compatible with the objectives of the policy (FOEN)
Federal Act on Forest	921	Farmers, forest landowners, forest managers	Compensation for deforestation	Conserve the forest in its area and spatial distribution	N.A.	N.A.	hectares of forest land	In 2016, 366 forestland conversions (mainly for non-agricultural purposes) were authorized, for 158.2 ha (FOEN). A report by ETHZ and HAFL shows that for most objectives the implementation of the 2020 Forest Policy is progressing well. Instead, the need was identified to make further efforts regarding the exploitation of the wood potential available, the improvement of the productive capacity of the forest economy, the health of the forest (forest soil, groundwater and vitality of trees), the balance between forest and game and the use of the forest for leisure and leisure activities. The most significant progress, on the other hand, is recorded with regard to the protective function of the forest and biodiversity. FOEN believes that the interim report confirms the good direction taken and in the second phase of implementation, which ends in 2019 (FOEN)
Federal Act on the Reduction of CO2 Emissions	641.71	Livestock farmers operating in Switzerland	Climate change adaptation strategy - Livestock farming	Avoid or deal with the harm to persons or damage to property of substantial value that may be caused by the increased concentration of	N.A.	N.A.	(a) emissions per kg of foodstuffs of animal origin (b) productivity (c) optimized rations (d) roughage for ruminants	Livestock management must be adapted to changing local conditions, e.g. selection of animal categories (e.g. ruminants on grasslands, other categories of animals near the production of animal feed). A better quality of roughage is synonymous to greater efficiency of digestion and, consequently, a reduction in the relative emissions per kilogram of animal foodstuff

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POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
				greenhouse gases in the atmosphere				animal produced. Combined meat and milk production and the use of specialized breeds can help reduce the intensity of emissions in animal production. Conflicts may arise with aspects of biodiversity, economy and marketability. Better productivity helps to reduce the number of animals needed and therefore a direct decline of greenhouse gas emissions. However, decreasing the number of animals makes sense only if consumer behaviour also changes, otherwise there would be an increase in meat imports and a transfer of emissions abroad. Grazing management in accordance with weather conditions with predominantly grazing at night and early morning in summer is a valid adaptation strategy to the expected increase in temperatures. Considering the welfare of the animals, it is also necessary to provide sufficient water and shadow; for the latter, the option of agroforestry systems could be helpful (FOAG)
Federal Act on Agriculture - Market Support -	910.1	Valuers (i.e. natural or legal persons as well as companies) who buy milk from producers and turn it into dairy products or resell it. Also includes direct sellers who purchase milk or milk components from other enhancers to produce dairy products	Additional payment for milk used in cheese-making (Cheese processing aid)	Create favourable conditions for the production and sale of agricultural products	2013: CHF 266.3m 2017: CHF 262.6m 2018: CHF 263.1m	CHF 264.0m (2013-2018)	(a) amount of subsidies (b) number of dairy farms (c) avg size of farms (ha) (d) raw milk sold (kg/tons) (e) no. of cows (f) milk/hectare (g) milk/cow (h) number of Swiss-made cheeses (e.g. DOP)	The milk sector has a share of around 20 per cent of total agricultural production in Switzerland. Most of the milk sold in Switzerland is transformed into cheese (42%), followed by butter (16%), consumption milk (11%) and long-life milk-based products such as skimmed milk and whole milk powder (10%). In 2018, turnover in cheese sales in the Swiss retail trade grew by 1.4% compared to the previous year. In terms of quantity, cheese sales declined slightly (-0.3%). Turnover has also increased for most fresh dairy products, including fluid milk, butter and cream (FOAG)

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POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
			Additional payment for non-use of silage	(1) create favourable conditions for the production and sale of agricultural products; (2) promote the sustainable use of natural resources and animal and climate friendly production	2013: CHF 32.3m 2017: CHF 30.3m 2018: CHF 29.8m	CHF 30.8m (2013-2018)	Ibid.	The milk sector has a share of around 20 per cent of total agricultural production in Switzerland. In 2015, there were 21,850 dairy farmers in Switzerland, of which 10,270 were in the mountain region and 11,580 in the lowlands, which sold about 3.46 million tons of milk. In 2017, there were 20,357 dairy farms (i.e. -46.5% from year 2000). About a third of this amount was produced without feeding silage to livestock, while 6 percent was organic milk. Forage without silage is an essential condition for the manufacture of Swiss cheese made from raw milk with a protected designation of origin (DOP) such as Gruyère, Emmentaler, Sbrinz or Tête del Moine (FOAG)
Federal Act on Agriculture - Direct Payments -	910.1	Eligible farmers, landowners or tenants	Proof of Ecological Performance (PER)	Link direct payments to ecological performance	Total DPs: 2015: CHF 2.77 billion 2016: CHF 2.79 billion 2017: CHF 2.80 billion	Total DPs: CHF 2.78 billion (2015-2017)	Re. AEO Quality areas: (a) Soil erosion (< 2-4 t/ha) (b) Soil compaction (c) Fertiliser balance (d) Plant protection prod.	The quality I target of 65 000 ha was exceeded in 2016 (75 163 ha). The targets for soil erosion were also achieved. The fertilizer balance goals have not yet been achieved: a reduction in nitrogen was observed in the 1990s; since then it has stagnated. The target of reducing nitrogen losses to 95,000t in 2017 has not been achieved. The target of reducing P surplus to 4 000t by 2017 has not be achieved, either (FOAG)
			Animal-friendly methods of production (BTS), regular outdoor exercise (RAUS)	Promote animal-friendly methods of production	2014: CHF 262.4m 2015: CHF 266.3m 2016: CHF 269.1m 2017: CHF 271.9m	CHF 267.4m (2014-2017)	(a) Amount of subsidies (b) Number of holdings (c) No. of livestock units	RAUS contributions have increased for most breeding categories in recent years, especially for cattle. This increase is probably due to the efforts of certain labels (e.g. Bio, IP, label programs of the retail trade), which provide an additional incentive for farmers to participate in the state animal welfare programs (FOAG)

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POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
			Grassland-based milk and meat programme	Promote near-natural and environmentally and animal friendly types of production	2014: CHF 104.8m 2015: CHF 107.9m 2016: CHF 109.2m 2017: CHF 110.2m	CHF 108.0m (2014-2017)	(a) Amount of subsidies (b) Number of farms (c) Hectares of grassland (d) Variety of grassland	Participation in the GMF program has remained constant at a relatively high level. On average, it has reached approximately 78% of grassland area and about 66% of farms (FOAG)
			Maintaining an open landscape	Compensation for public services provided by farmers	2014: CHF 140.6m 2015: CHF 140.8m 2016: CHF 140.6m 2017: CHF 140.0m	CHF 140.5m (2014-2017)	Re. AEO Quality areas: (a) Amount of subsidies (b) Number of holdings (c) Hectares of land	At the beginning, contributions increased slightly, but have been decreasing continuously since 2016 (FOAG). The subsidies contributed significantly to the achievement of the objective to keep cultural landscapes open (FOEN)
			Use and maintenance of summer pastures	Compensation for maintaining open farmland	2014: CHF 121.0m 2015: CHF 122.3m 2016: CHF 124.6m 2017: CHF 125.2m	CHF 123.3m (2014-2017)	Ibid.	Between 2003 and 2016, the number of summering farms decreased from 7472 to 6790, because farms have become larger as a result of mergers etc. Normal stock levels increased by around 2000 (FOAG)
			Difficult farming conditions in hilly areas	Compensation for maintaining open farmland	2014: CHF 107.2m 2015: CHF 108.1m 2016: CHF 107.3m 2017: CHF 125.4m	CHF 112.0m (2014-2017)	Ibid.	The share of land eligible to contributions fluctuates slightly because of weather conditions affecting the type of farming (more or less pastureland or hay meadows). In 2017, there was a comparatively strong increase. The difficulties in the valley zone are comparable to those in the hill and mountain zone, which is why the support is justified (FOAG)
			Use of Alpine pastures	Compensation for maintaining open farmland	2014: CHF 101.6m 2015: CHF 107.7m 2016: CHF 109.5m 2017: CHF 109.1m	CHF 106.9m (2014-2017)	Ibid.	Introduced in 2014, this contribution has had a more direct effect on the goal of an appropriate number of animals than the previous subsidies (FOAG)
			Difficult farming conditions on steep slopes	Compensation for maintaining open farmland	2014: CHF 13.4m 2015: CHF 13.4m 2016: CHF 12.5m 2017: CHF 11.3m	CHF 12.6m (2014-2017)	Ibid.	Most of these contributions benefit smaller farms (i.e. farms with less than 20 ha). Since 2016, the areas receiving contributions have been steadily decreasing (FOAG)

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POLICY	LEGAL REF	TARGET	POLICY INSTRUMENTS	MAIN OBJECTIVES	ANNUAL COST	AVERAGE COST	KEY IMPACT INDICATORS	CLAIMED IMPACT
			Biodiversity subsidies: (a) Variety of species and habitats (b) Connecting corridors	Encourage/promote a variety of species and habitats	2014: CHF 354.1m 2015: CHF 387m 2016: CHF 400m 2017: CHF 414m 2018: CHF 410m (est.)	CHF 388.7m (2014-2017)	Ibid.	In 2017, quality I level areas remained almost stable. Grassland pastures and wooded pastures that are exploited extensively increased. Low input pastures decreased. Interconnected surfaces increased, but less than in previous years (FOAG). The target to reach 65 000 ha of BPAs in lowlands had already been achieved by 2013. The target to have over 50% of BPAs participating in a regional networking project had already been reached in 2012. The goal of 40% of Quality II BPAs was achieved in 2017 (OECD)
			Quality of the landscape	Maintain, promote and further develop a varied landscape	2014: CHF 70.1m 2015: CHF 125.4m 2016: CHF 141.7m 2017: CHF 145.0m	CHF 120.5m (2014-2017)	Ibid.	Participation of farmers in the program is very high. Three quarters of all farms have participated in a landscape quality project since 2014. Two thirds of the farms have implemented measures that they would no longer implement without landscape quality contributions, such as diverse crop rotation in arable farming, certain structural measures, chestnut groves or mountain farming. The largest proportion (66%) of landscape quality contributions are used for the preservation and maintenance of structures such as trees, hedges and dry stone walls and for the promotion of diverse arable farming and grassland landscapes. Farmers consider the landscape quality measures to be non-profitable (FOEN)

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Table 17. Summary of Swiss stakeholder perceptions.

Stakeholder Type	Perceived Relevance	Perceived Democracy	Perceived Legitimacy	Perceived Efficiency	Perceived Effectiveness
Academia	+/-	+/-	+/-	+	+
Farmers Interests	+/-	+/-	+/-	+/-	+/-
Farmers Interests	+	+	+	+	+
National Government	+	+	+/-	-	+/-
National Government	+/-	+/-	+/-	+	+
National Government	-	-	-	-	-
Public Interests	-	+/-	-	-	-
Public Interests	-	+/-	-	-	-
Regional Government	+	+	+	+	+
Regional Government	+	+	+	+/-	+
TOTALS:					
+	**4**	**4**	**3**	**3**	**5**
-	**3**	**1**	**3**	**4**	**3**
+/-	**3**	**5**	**4**	**3**	**2**

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4.2.4 Sweden – Boreal BGR

4.2.4.1 Characteristics and distribution of permanent grassland in Sweden

Most of Sweden and its grasslands are found in the boreal biogeographical zone. The geology of the Boreal region is "characterised by old weathered sedimentary rocks and bedrock, such as gneisses and granites. Glacial and post-glacial erosion and associated deposits have formed large undulating plains and rolling hills broken by occasional mountain outcrops and river valleys (Condé et al., 2002, pg. 4). However, Sweden's borders are expansive and extend from 55°N latitude in the south to 69°N latitude in the north. As a result of these extensive vertical borders, there is considerable diversity in the landscape.

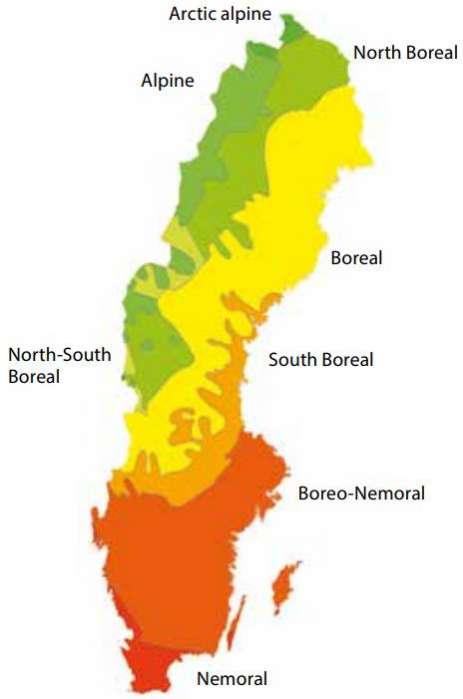

Figure 39. Sweden's biogeographical zones from RSAAF, 2015, page 3.

The southernmost part of Sweden is in the Nemoral biogeographic zone (see Figure 39 above). Also referred to as the Continental zone, this is where Sweden's most productive and intensive agriculture

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takes place[25]. This landscape is flat and is dominated by arable crops. The structure of this landscape dates as far back as the Iron Age, where most of the natural forests were consumed for fuel and building materials (Eriksson et al., 2002).

The rest of Sweden is part of the boreal zone (including sub-zones) where the majority of grasslands still exist (Figure 40). The highest concentration of semi-natural permanent grasslands are found in the Boreal-Nemoral region and are predominantly used for cattle and sheep grazing. Much of this area is part of the South Småland peneplain that was formed by protracted glacial erosion (Peterson et al. 2017). Extensive exposure of bedrocks, large flat surfaces interspersed with hummocks; a poor topsoil (Lemdahl et al., 2013) and close proximity to large population centres make this area relatively less suited for arable farming, yet ideal for grazing.

[25] In addition to this area, there is a ”belt” of concentrated and intensive farming extending from Gothenburg on the west and running north east to the Stockholm region on the East coast. This agriculturally intensive northern part of the Boreal-Nemoral Zone also extends to the Swedish Islands of Öland and Visby (see figure X)
,

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Figure 40. Dominant agricultural landscape usage translated from Glimskär et al. (2017).

The further north one goes, starting in the South Boreal and extending to the north Boreal zones, the population becomes increasingly sparse and boreal forests dominate. Many of the grasslands dotting the landscape lie adjacent to farmsteads and close to water. They are mostly man-made and at constant risk of being reclaimed by the forest. Owing to the warm gulf-stream currents, Sweden's forests are among the most northerly in the world. In addition to the grazing of cattle and sheep, the border between the boreal and north boreal zones are home to 4600 reindeer owners (mostly of Sami ethnic origin) and 250,000 reindeer (RSAAF, 2015). The cultural centre for reindeer herding is sometimes referred to as Jokkmokk and extends as far north as Karesuando, in the northern boreal zone, to Idre in the mountainous, North-South Boreal zone, which abuts Norway (Sonniksen, n.d).

According to the Swedish Board of Agriculture, there were 1.6 million hectares of fallow and grass-covered agricultural land in 2015. Of this total, 682,000 hectares were classed as permanent grassland and consisted of 303,000 grazing pastures and 379,000 hectares of long-term grasslands. Changes to

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how permanent grasslands were defined occurred in 2016 and as a result, many of Sweden's grasslands were no longer considered eligible for direct payments. Previously, Sweden considered all arable lands, "land that can easily be ploughed and all pastures being grazed (land not suitable for ploughing) constitute agricultural land and should, therefore, be eligible for direct payments" (Jordbruksverket, 2016. Pg. 17). The European Commission however, only considers arable land eligible (i.e. arable land in rotation, arable land with permanent crops, and arable land with permanent grasslands ("long-term grassland"). As a result, long-term grasslands eligible for payments dropped from 379,000 to 96,000, while grazing pastures remained the same at 303,000. As of 2016, around 450,000 hectares of permanent grasslands were considered eligible for direct payments and these were classed into three types: arable land in rotation, arable land with permanent crops, and arable land with permanent grasslands ("long-term grassland"). (Jordbruksverket, 2016) A break-down of the types of grassland by county farmers apply for to get direct support can be found in Table 18.

Table 18. Translated from Swedish—"Support area of pastures and meadows in hectares. The areas are largely based on the areas the farmers have applied for in 2016. Source Naturvårdsverket (2018).

County	Pasture	Mown-meadow	Forest-pasture	Mountain-pasture	Alvar-grazing	Sward/rocks mosaic-grazing	Unspec. pasture	Total pasture and meadow
Blekinge	9 774	72	203	-	-	300	113	10 461
Dalarna	4 737	157	96	5 151	-	23	146	10 310
Gotland	16 369	228	4 419	-	4 645	227	32	25 921
Gävleborg	3 892	214	35	1 105	-	12	145	5 405
Halland	15 198	123	22	-	-	336	198	15 876
Jämtland	3 468	84	736	7 864	-	-	124	12 276
Jönköping	39 722	157	179	-	-	10	266	40 334
Kalmar	48 874	868	1 878	-	21 296	84	159	73 160
Kronoberg	20 072	225	36	-	-	52	158	20 543
Norrbotten	663	2 111	93	-	-	-	82	2 948
Skåne	52 626	2 108	59	-	-	25	468	55 285
Stockholm	9 749	103	683	-	-	61	177	10 773
Södermanland	15 469	393	533	-	-	178	105	16 678
Uppsala	14 217	362	1 486	-	-	256	135	16 456
Värmland	6 753	229	41	62	-	91	206	7 382
Västerbotten	1 495	169	182	193	-	-	115	2 155
Västernorrland	1 637	52	6	159	-	-	122	1 975
Västmanland	6 222	550	1	0	-	41	56	6 869
Västra Götaland	57 052	850	750	-	-	3 789	761	63 202
Örebro	8 160	208	216	1	-	19	113	8 716
Östergötland	39 862	219	1 383	-	-	271	232	41 966
Total	376 584	9 027	14 154	16 189	26 056	5 774	4 158	451 943

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4.2.4.2 Key challenges or threats

Sweden's stated aim for the agricultural landscape is "to protect biological production and food production and at the same time, biodiversity, cultural, and environment values must be preserved and strengthened (Naturvårdsverket, 2018, pg. 21). There is general recognition that (grassland) policy has failed to strengthen if not preserve many aspects of production, biodiversity, cultural heritage, or the environment. Nevertheless, most actors in Sweden agree that without the (flawed) grassland policies that are in place, the situation would be much worse. Consequently, the discussion in Sweden is not whether grassland policy is needed, but rather how it can be improved.
In this section, we provide an overview of the key challenges or threats inhibiting Sweden's policy aim of promoting profitable agricultural businesses whilst balancing ESs such as the need to improve biodiversity, the environment and cultural values.

Grassland conservation status: Despite environmental allowances, the status of the cultivated landscape's habitat types is not good. There may be rapid and continuous decrease in the quality of remaining semi-natural grasslands. For example in Sweden, between 2002 and 2004 18% of semi-natural grasslands reported as valuable, were no longer considered valuable in 2013 due to abandonment and species lost (Waldén, 2018). In Sweden's report to the EU, most grassland habitats, classified according to the EU Habitats Directive, had a negative trend or bad status (Wenche Eide, 2014). Conservation status is subjectively defined as habitat types that have too small and fragmented areas, and poor quality due to cessation of traditional use, nitrogen loss and poorly adapted care. Under this definition, all grassland habitats in the boreal region were assessed as having a "bad status" in 2013 (if the status was known). Moreover, in all cases the trend between 2007 and 2013 showed either a deteriorating status in the various grassland habitats or that the bad status was maintained (see Table 19).

Explanations for why the conservation status has worsened in the boreal region includes a myriad of factors, but the primary explanation is that the agricultural landscape lacks enough farmers and grazing animals to manage the land. The reason there are not enough farmers is partly due to structural changes that have had a profound effect on Sweden's countryside. The total number of farms has decreased considerably since the 1970s. For example, between 1976 and 2016, the amount

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of Swedish dairy farmers declined 93% or by 52,753. The 3000+ dairy farmers remaining tend to be considerably larger and are concentrated in the south. The remaining companies with grazing animals are often large and they are generally unable to manage many small pastures further away from the farm. As a result, there is a tendency to abandon smaller and desolate grasslands. This not only changes the landscape, but also reduces the number of species through the loss of habitat and green infrastructure.

Eligibility and fair compensation tends to permeate the discussion in Sweden. Many of the abandoned grasslands are in the North, while most of the compensation favors farms in the South. This is closely related to how grasslands are defined—e.g. areas that contain too many trees or "bushes with low value for grazing" are excluded from compensation (and tend to be more prevalent in the north). As we mentioned in the start of this chapter, close to 300 000 hectares of Swedish permanent grasslands previously eligible for payments disappeared due to changes in definitions. Moreover, areas having the most biological value are often comprised of complex landscapes that require difficult management regimes that are not adequately compensated. Similarly, there is a strong belief among farmers and advisors that EU-policies are too complex, the rules too difficult to follow and often there are too many hurdles to overcome to get compensated. Consequently, many farmers do not bother to apply for compensation even if they are entitled.

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Table 19. “Conservation status for the seventeen habitats associated with grassland in Sweden. Status and area according to Sweden's latest reporting pursuant to Article 17 of the Directive to the European Commission (2013). Red marking means that the nature type is in poor status.

Grassland Habitats		Assesment of habitats status						Area ha
		Alpine Region		Boreal Region		Continental Region		
Code	Name	2007	2013	2007	2013	2007	2013	
1330	Atlantic salt meadows							2 400
1630	Boreal Baltic coastal meadows					+		5 900
4010	Northern Atlantic wet heaths with Erica tetralix			-	-	-	-	260
4030	European dry heaths			-	-	-	-	13 200
5130	Calcareous grasslands			x	x	x	x	4 800
6110	Basophilic grasslands of the Alysso-Sedion albi			-	-			2 300
6120	Xeric sand calcareous grasslands					-		110
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates	-	-	-	-	-	-	20 950
6230	Species-rich Nardus grasslands, on siliceous substrates in mountain areas	-	-	-	-	-	-	9 000
6270	Fennoscandian lowland species-rich dry to mesic grasslands		-	-	-	-	-	144 400
6280	Nordic alvar and precambrian calcareous flatrocks			-	-			19 610
6410	Molinia meadows on calcareous	-	-	-	-	-	-	36 620
6430	Hydrophilous tall herb fringe communities of plains			x		x		6 350
6450	Northern boreal alluvial meadows	-	-	-	-			2 800
6510	Lowland hay meadows			-	-	-	-	2 600
6520	Mountain hay meadows	-	-	-	-			1 070
6530	Fennoscandian wooded meadows			-	-	-	-	590
9070	Fennoscandian wooded pastures	-	-	-	-		-	74 100

In addition to poor conditions and the negative trend seen in grassland habitats, the green infrastructure of the landscape continues to deteriorate, partly by decreasing the number and area of meadows and pastures, and partly by reducing the amount and quality of the landscape elements. Stone walls and arable islands, etc., are of great importance to many species such as scattering corridors and refuges in the arable landscape. Their disappearance is creating species populations that are too small and are too far apart to survive in the long run. (KSLAT, 2017).

Vegetation requirements associated with EFA (Ecological Focus Area) have negatively affected grassland pastures. Prior to the introduction of EFAs, many farmers ploughed up permanent grasslands so as not to risk them entering and remaining as requirements. This turned out to be unnecessary with the design EFA finally got. On the other hand, after the introduction, they have had some additional negative impact by long-standing fallow after five years being counted as permanent

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grassland. Therefore, in order to continue to count them as EFA, they plough them up, or report them as dead and not as permanent grassland (KSLAT, 2017).

In Table 20 below, we summarize many of the current threats and challenges Sweden faces in their aim to "protect biological production and food production and at the same time, biodiversity, cultural, and environment values must be preserved and strengthened".

Table 20. Permanent Grassland Challenges and threats in Sweden

Key Challenges	Why is it a problem/Threat	Reference
Improving environmental allowences	This study shows that there is much to be learned by drawing inspiration from other countries' solutions within the rural program. The clearest difference between Sweden's and several other countries' environmental allowances is that it is common to have a set of basic measures that must be met in order for other more demanding allowances to be applied for. Many countries also have a clearer regionalization of remuneration, which enables adaptations to different natural conditions (similar to a clearer integration of selected environment into the entire environmental compensation system). (Summary page 3)	Hur kan Landsbygdsprogrammets miljöersättningar förbättras? Erfarenheter från andra länder (SJV) Rapport 2012:24 (summary page 3)
Abandonment	The areas of arable, meadow and pasture land have decreased, the arable land is used more intensively and the forests have become increasingly denser. Agriculture is closed down and fields and pastures grow in areas where profitability is lower. Habitat types and cultural environments that are favored by an open and varied cultivation landscape.	Ett rikt odlingslandskap Jordbruksverket Rapport 2018:31 Sammanfattning page 3-4
Conservation	The grasslands' habitats are largely linked to the cultivation landscape, which has undergone changes. The rationalization of agriculture and forestry, the entire landscape has changed much, which has been negative for most types of habitats and species. The situation for grasslands remains miserable, and the status of most of the habitats is poor. (p.18)The outlook is miserable for most grasslands.	Arter & naturtyper i habitatdirektivet – bevarandestatus i Sverige 2013 page 18

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Key Challenges	Why is it a problem/Threat	Reference
Profitable farms	Milk production The number of dairy farms, the number of dairy cows and the amount of milk produced in the area receiving national support is decreasing. In 2017, 700 dairy companies received national support, which is a decline of 55 companies compared to 2016. Milk production decreased by 1.6 percent, as much as in the rest of the country. The majority of the national support goes to milk production for a long time. For companies with milk production, the support is of great financial importance. Despite the national support, compensation support and environmental compensation for election cultivation 1, companies in Support Area 1-5 have about 30-50 percent lower profitability compared to a reference area in Southern and Central Sweden. Calculations also show that if national support for milk was removed, 40 percent of dairy farms in the support areas would show zero results or lower, that is, they would have no profitability. (p.6)	Jordbrukets utveckling i norra Sverige under 2013-2017 (page 6)
Regional differences in support	The environmental compensation showed great regional differences where southern Sweden was favored. One explanation for the uneven regional distribution was that the selection of eligible landscape elements was primarily representative of the southern parts of the country. This meant that farmers in Norrland did not have the same opportunity to receive benefits. p.25	Ett rikt odlingslandskap Jordbruksverket Rapport 2018:31 page 25
Agricultural support payments	The community's support and compensation in the form of farm support, rural programs, grants for protection and care of valuable nature. The money is also of great importance in maintaining important supportive, producing and experience-based ecosystem services. The design of the agricultural support affects ecosystem services. For example, adjusting the conditions of farm support could lead to a more favorable effect on biodiversity than they currently have. (P.12)	Ett rikt odlingslandskap Jordbruksverket Rapport 2018:31 Sammanfattning page 3-4

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Key Challenges	Why is it a problem/Threat	Reference
Agricultural support payments	National support is crucial for farmers in northern Sweden. Without the support for milk, 40 percent of dairy farms in the support areas would show zero results or lower. • In relation to the rest of the country, agricultural land in northern Sweden has decreased more. It can lead to more overgrowth and adversely affect biodiversity. • Production increases in pig production and slaughter pig production, but decreases in the other four production branches.	Jordbrukets utveckling i norra Sverige under 2013-2017 page 1
Regional differences	The environmental compensation showed great regional differences where southern Sweden was favored. One explanation for the uneven regional distribution was that the selection of eligible landscape elements was primarily representative of the southern parts of the country. This meant that farmers in Norrland did not have the same opportunity to receive benefits.	Jordbrukets utveckling i norra Sverige under 2013-2017 page 25
Definitions of grasslands	The definitions of grassland land are a bureaucratic construction, and it should not be put on farmers to be able to detail this. • The grassland definition should be changed as it creates problems on many levels, including for tree values, mosaic structure in grasslands, the opportunity to look at the lands from a landscape perspective, and for confidence in the compensation system.	Hur kan Landsbygdsprogrammets miljöersättningar förbättras? Erfarenheter från andra länder (SJV) Rapport 2012:24 page 128
Species richness of butterflies (measurement)	No changes between the two time periods (2006-2010 and 2011–2015) in species richness of butterflies, hops or vascular plants can be associated with the type of environmental compensation. The only significant changes in vegetation are a slight increase in field cover and that the amount of short-grown grassland vegetation (<5 cm height) has decreased. p.6	Arter & naturtyper i habitatdirektivet – bevarandestatus i Sverige 2013 p.6

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Key Challenges	Why is it a problem/Threat	Reference
Affecting biodiversity negatively	The expansion of pastures, plantations in combination with urbanisation has increased the need for water and energy, which in turn is affecting biodiversity negatively. These changing and competing land use patterns on a global scale where we make use of a growing share of resources, undermines the capacity of ecosystems to provide goods and services. The challenge is to manage the trade-offs between human needs and to maintain the capacities of ecosystems to provide us with these needs. (p.3)	Competing land use associated with Sweden's forests page 3
Landscape composition/structure	In order to achieve the necessary improvements in the cultivation landscape, various sectors of society must cooperate, not least agriculture and forestry. (p19)	Competing land use associated with Sweden's forests page page 19
Regional differences in support	Regionally, there are major differences in impact. The greatest effect has been in the lower Norrland and in the forests of Svealand (support areas 2b, 3 and 4a; see Appendix 3. Area breakdown for compensation support in 2007-14). There, every sixth job in agriculture depended on the wages. In the plains (areas 9m and 9s), the remuneration did not significantly affect the number of jobs. (p. 61) Regionally, the effect is most evident in northern Sweden. This is also where the highest aid amounts are paid. Without the compensation support, for example, there would not be financial conditions for having dikes in northern Sweden. In area 3, which lies in the border area between Norrland and Svealand, there would hardly be any cattle left without the compensation support. (p.103)	Bra vallersättning och kompensationsstöd? – Hur kan olika utformningar påverka jordbruket, miljön och samhällsekonomin? SJV Utvärderingsrapport 2016:6 (page 61 and 103)
Payment scheme	The agri-environmental payment scheme for grassland and the compensatory allowance both increase the Swedish grassland and the number of cattle significantly. The compensatory allowance has a very low social efficiency, but it has appreciable positive employment effects at relatively low budget costs. The largest impacts on the social efficiency of the two schemes come from their effects on the climate, from losses in other sectors caused by taxes to finance the payments, and from less efficient production of agricultural commodities.	Bra vallersättning och kompensationsstöd? – Hur kan olika utformningar påverka jordbruket, miljön och samhällsekonomin? SJV

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Key Challenges	Why is it a problem/Threat	Reference
		Utvärderingsrapport 2016:6 page 8
Budget Reform	EU collaboration means solidarity with poorer member countries, however there is a limit to Swedish tolerance. Any reform that seeks to drastically change budget allocation risks disturbing Swedish tolerance. Moreover, countries that receive the largest direct support today tend to be net recipients of funds and therefore Sweden would not be too keen on increasing their net contribution to other lands.	Rabinowicz, E. (2016) EU:s jordbrukspolitik--hur ser reformtrycket ut inför 2020? AgriFood Economics Centre. Rapport 2016:4
Market Reform	Sweden would like to see more market oriented reforms including phasing out or reducing direct support. This entails moving funds to Pillar 2 in support of environmental and other relevant initiatives. pg 68	Rabinowicz, E. (2016) EU:s jordbrukspolitik--hur ser reformtrycket ut inför 2020? AgriFood Economics Centre. Rapport 2016:4
Trade-offs	The compensatory allowance makes it profitable to increase the area of permanent pastureland significantly, but the payments for grassland reduce the pasture area a little. The effects of grassland on biodiversity are not sufficiently explored. Pg. 6	Hasund, K., et al. (2016) Bra vallersättning och kompensationsstöd? Hur kan olika uformningar påverka jordbruket, miljön och samhällsekonomin? Jordbruksverket 2016:6.
Trade-offs	The leaching of nitrogen and phosphorous has been smaller in the two analysed program periods (2007–14 and 2015–20) as a result of the grassland payments. On the other hand, the nutrient leaching has been larger because of the compensatory allowance. The use of	Hasund, K., et al. (2016) Bra vallersättning och kompensationsstöd? Hur kan olika uformningar påverka jordbruket, miljön och

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Key Challenges	Why is it a problem/Threat	Reference
	pesticides are not expected to be much affected by these two schemes in the period 2015–20.	samhällsekonomin? Jordbruksverket 2016:6.
Trade-offs	Large emissions of greenhouse gases were caused by the compensatory payments in the two periods. The grassland payments were, however, good considering climate effects. It is mainly by the emissions of methane from cattle and by increasing or decreasing the amount of carbon in the soil that the payments affect the climate.	Hasund, K., et al. (2016) Bra vallersättning och kompensationsstöd? Hur kan olika uformningar påverka jordbruket, miljön och samhällsekonomin? Jordbruksverket 2016:6.
Trade-offs	The agri-environmental payments to grassland involved large social economic losses in the beginning of the period 2007–14, but after revised conditions of the payments and increased world market prices, it became instead quite socially efficient. The social efficiency of the scheme is moderate in the present period 2015–20. The compensatory allowance does, on the other hand, induce large social economic costs, both in the 2007–14 and in 2015–20. The compensatory allowance generates much employment in LFAregions, but at high social cost. The budget cost is, however, relatively low, compared with other labour market measures.	Hasund, K., et al. (2016) Bra vallersättning och kompensationsstöd? Hur kan olika uformningar påverka jordbruket, miljön och samhällsekonomin? Jordbruksverket 2016:6.
Better data/Modelling	Limited knowledge and ability to measure the effect of grassland policy on climate--including greenhouse gas emissions and carbon sequestration on a regional scale. Because the connection between agriculture production methods and climate effects are difficult to ascertain, there is a need to improve modelling and data collection. There is a need to investigate how agricultural support affects biological diversity. In particular, it has been pointed out there is a	Hasund, K., et al. (2016) Bra vallersättning och kompensationsstöd? Hur kan olika uformningar påverka jordbruket, miljön och samhällsekonomin? Jordbruksverket 2016:6.

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Key Challenges	Why is it a problem/Threat	Reference
	need to study e.g. effects on biodiversity on the same scale support is provided (currently this is not the case). pg. 209	
Improved measurement	Conditions for several of the environmental measures have developed positively or are relatively unchanged, however, aims relating to nature (biodiversity) and culture are difficult to measure/realize. Agricultural support is important for being able to reach environmental quality goals in the big picture. More work needs to be done in order to achieve bio-diversity and cultural goals in the agricultural landscape Pg. cover page	Jordbruksverket (2018) Ett rikt odlingslandskap Fördupad utvärdering 2019. Jordbruksverket report 2018:31
Abandoment	Without farm support, many grasslands would be abandoned and be reclaimed by the forest. Up to half of the farms may disappear without support, especially in the northern parts and rural areas of Sweden. Arguments for how keeping farms in business benefit nature, cultural, and social values as well as more diversified agricultural landscape are offered. Pg. In executive summary	Jordbruksverket (2018) Ett rikt odlingslandskap Fördupad utvärdering 2019. Jordbruksverket report 2018:31
Regional Approaches needed	In forest areas (and mellendbygd?) and northern Sweden, the reduction of farms and farmers is the greatest challenge in preserving the agricultural landscape, nature and cultural values. The most important action would be to increase compensation and improve profitability to overcome these challenges.	Jordbruksverket (2018) Ett rikt odlingslandskap Fördupad utvärdering 2019. Jordbruksverket report 2018:31
Regional Approaches needed	In rural communities (slättbygd??) biological diversity and ecosystem services need to be supported. Farmers need greater support in covering the costs involved in managing and restoring natural meadows, pasture lands and other valued environments. IN addition, there needs to be more incentives for small biomes to flourish and increased subsidies to cover costs. Arguments for re-introducing support for restoration of valued nature and cultural environments.	Jordbruksverket (2018) Ett rikt odlingslandskap Fördupad utvärdering 2019. Jordbruksverket report 2018:31

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Key Challenges	Why is it a problem/Threat	Reference
Lack of grazing animals	Not only is there a lack of grazing animals, those that exist do not graze lands with the most value. E.g. cows graze on well-nourished fields to maximize production. Some milk cows have been replaced with beef cattle who are able to graze on lands with lower nutrition, but often higher biological values. pg 11	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Asymetrical laws across EU.	Many of the cultural values and traditions are disappearing in parallel with the disappearing milk and cattle farmers. Frustratingly, Sweden believes that it has the best farmers with the highest standards of animal welfare, lowest use of antibiotics and chemicals and highest quality in the world. The quality standards Sweden has chosen comes at a cost, making production in Sweden higher and a cost disadvantage to most other countries (that have lower animal welfare standards, greater use of anti-biotics, longer animal transport, etc.). This results in greater imports, fewer Swedish farmers, the encroachment of forests, and reduced biodiversity pg. 24	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Sanctions	Milk producers in Sweden have suffered greatly from sanctions on Russia who has stopped importing dairy products from Western Europe. Pg 25	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Biodiversity	A number of species are threatened in Sweden and most of them are in forest regions where farmers are disappearing or abandoning land.	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Knowledge and appreciation of landscape	As farmers disappear and the countryside becomes emptied of businesses and people, the appreciation for the cultural and traditional aspects of the landscape disappears pg. 25-26	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Fragmentation	Fragmentation of the landscape has severe and negative consequences for different species. Förutom naturtypernas dåliga tillstånd och negativa trend tillkommer ytterligare ett problem: fragmentiseringen. Landskapets gröna infrastruktur fortsätter att försämras, dels genom att antalet och arealen av slåtter- och betesmarker minskar, dels ge-nom att mängden av och kvaliteten på	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).

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Key Challenges	Why is it a problem/Threat	Reference
	landskapsele-menten minskar. Landskapselement, som stenmurar och åkerholmar, etc., har stor betydelse för många arter som spridningskorridorer och refuger i åker-landskapet. pg 31	
Structuration	Smaller pastures that are spread out across the land, especially in remote areas are being abandoned. The population is too small and to spread out for farmers to make ends-meet.	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).
Technological innovation	Technological improvements have led to efficiencies in production which in turn have reduced the amount of area needed in production. E.g. better drainage, mineral fertilizers, more effective machines, and storage techniques have radically improved production and waste in food production. However, technology has made it so that pasture lands, in many but not all cases are less efficient in the production food products. page 33	KSLAT (2017) Utan pengar--inga hagar och ängar. 5(156).

4.2.4.3 Brief description of the governance structure and policy context

"Sweden is a democracy with a parliamentary system of government. This means that public power is based on the people. The Swedish people elect representatives to the parliament in the parliamentary elections every four years. The parliament appoints a Prime Minister who is commissioned to form a government. The government governs Sweden by enforcing what the parliament has decided. The government is also taking initiatives for new laws and amending existing laws. https://www.regeringen.se/sa-styrs-sverige/" There are approximately 200 government agencies that assist in this work. (Swedish Parliament).

Agriculture in Sweden is regulated at various levels, primarily through the EU's Common Agricultural Policy (CAP) and through Swedish national policies. In addition, there are many international conventions, such as the Convention on Biological Diversity.

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Before Sweden became an EU member, Swedish agricultural policy was dominated by central price agreements and border protection (import restrictions and export subsidies). In the price agreements, domestic product prices were negotiated between the industry and the government. The policy supported structural rationalization in the form of concentration of animal husbandry to certain regions and the merging of farms into larger units. With EU membership in 1995, CAP began to apply in Sweden as well and is today the dominant political control of Swedish agriculture. However, there is scope for national governance and legislation both within the CAP and through the national policies of Sweden. (KSLAT, 2017).

4.2.4.3.1 Details about the specific area of study focus

Because of the multi-functionality of agriculture, sustainable land use in the boreal region is fundamental in order to deal with competing grassland uses and objectives, such as conservation of plant communities and the maintenance of an open landscape. Many boreal pastures are marginal agricultural sites that must be managed with great care in order to maintain valuable forage resources for grazing animals and preserve biodiversity. The type and intensity of grazing is crucial for the composition of the vegetation as well as the services that benefit both people and animals, such as forage production and biodiversity (EEA, 2002).

4.2.4.4 Identifying policies relevant to permanent grassland

4.2.4.4.1 Data collection

An expert ("blue-ribbon") panel was used to identify relevant permanent grassland policies and consisted of five key actors from the following institutions:

- Academia (n=1)
- National government (n=1)
- Regional government (n=1)
- Farmer interests (n=2)

The decision to include these institutions and experts started with one key informant who recommended a number of institutions and individuals. Initial contact was made with the institutions and experts and from there, each institution self-selected the expert best suited to advising us on grassland policy questions. Once identified, the experts were consulted by email and phone. The

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phone conversations were informal open conversations in which the purpose of the consultation was explained and advice sought in a conversational way.

4.2.4.4.2 Policy mapping

Our Swedish blue-ribbon panel identified five Swedish policies and instruments related to permanent grasslands, but not previously mentioned by the larger Delphi policy study.

The five different Swedish policies and policy instrument related to permanent grasslands are described as follows:

- **The Swedish Board of Agriculture's description of regulation, regarding the consideration of natural- and cultural values in agriculture.**

  The Swedish Board of Agriculture's description of regulation exist to protect the habitat of the farmland's wild animals and plants. They also exist for preserving cultural relics. Some landscape elements must not be removed or damaged if they have cultural-historical values or are valuable for the plants and animals of the cultivated landscape. The mechanisms that contribute are that consideration should be given to, among other things, the closure and new cultivation of land, in the case of soil drainage or in order to spare, for example, field islands, culture cairns, stone cairns, wetlands, stone walls and smaller tree stands. These permanent grasslands can be important habitats for many species. The regulations should also be used to protect cultural heritage values as well as plant- and animal life.

- **Cattle grazing and outdoor living**

  Cattle should be outdoors during the summer in Sweden. The reason is that much of the animal's welfare is dependent on the possibility of a natural grazing behaviour and being able to move freely. There are different rules for cattle depending on whether the animals are to be kept for milk or meat production. The grazing requirement can help keeping the landscape open.

- **Nature reserve (in addition to those in Natura 2000)**

  Nature Reserve is one of the most common ways to protect valuable nature in the long term. The nature reserves constitute a very large part of the area in Sweden that is protected with the support of the Environmental Code. The mechanisms that contribute are preserving biodiversity; nurture

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and preserve special natural environments; meet the needs of outdoor recreation areas; protect, restore or innovate valuable natural environments; protect the restored or newly created habitats for species worthy of protection. The Nature reserve is about significantly smaller areas. Often, funds for the management of the reserves are lacking, so that their claim becomes worse. Landowners lose availability and the overall result can deteriorate. Expensive to manage with public employees, cheaper with compensation to landowners. However, some top items may be necessary to ensure protection.

- **The Environmental Code's rules of consideration**

  The Environmental Code's general rules of consideration shall prevent negative effects of activities and increase environmental considerations. The environmental rules are contained in the Environmental Code, Chapter 2. All environmental requirements set according to the Environmental Code are based on the general rules of consideration. The mechanisms that contribute are for example, the knowledge requirement, where the person who runs a business or takes an action must have sufficient knowledge of e.g. how the environment is affected and can be protected.

- **Agricultural support for farmers in Norrland (Northern Sweden)**

  The agricultural support for farmers in Norrland is currently SEK 423 million per year (2018). The agricultural support was recently raised by 100 million by the former Swedish government. A large part of the agricultural support is allocated to dairy farmers. The agricultural support can help keeping the landscape open.

  Sweden provides national support for areas where there is less potential for farming than the rest of the country. The poorer conditions depend partly on the climate and partly on long distances. The purpose of the national support is, to some extent, to smooth out the income differences that arise due to the poorer conditions. The majority of the national aid has long been spent on milk production. For companies with milk production, the aid is of great economic importance. Despite the national support, the compensation aid and the environmental compensation, farmers in support areas 1-5 have about 30-50 percent lower profitability compared to a reference area in southern and central Sweden. Calculations also show that if the national support for milk was

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removed, 40 per cent of the milk companies in the assisted areas would show zero results or lower, i.e. they would have no profitability.

The policies that were relevant and unique to Sweden along with the EU policies investigated by each biogeographic region comprise the policy arenas mapped by the Boreal biogeographical region—i.e. Sweden. A summary of this work can be found in the policy analysis tables (PAT) below (see Table 21) which describe the main policies and instruments (EU and national-level), that seek to influence Swedish permanent grasslands.

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Table 21. Summary of PAT for Sweden: Evaluations of policies

Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of Instrument	Claimed impact in Sweden
Cap pillar I: Basic payment (Regulated at European level and implemented at national level)	Increase rural employment; to increase revenue; promoting the natural environment; promote the cultural environment	Farmers and landowners get support if they comply with GAEC (Good agricultural and environmental conditions); differ depending on region and size of land	Minimum income to farmers	Incentive and regulatory	160,000 hectares of pasture land; feed for 325,000 for cattle; the most important factor for rural employment; contributes to biodiversity
Cap pillar I: Greening (Regulated at European level and implemented at national level)	The purpose of the greening is to reduce the climate impact of agriculture and to promote biodiversity in agriculture. The greening aid is a compulsory aid for anyone seeking farm support.	Farmers must grow at least 2 or 3 crops on arable land. Some farmers must have at least 5 percent of the arable land as so-called ecological focus areas.	Compensate the cost associated with the supply of environmental goods	Incentive and regulatory	The basic payment including the greening is paid per hectare of agricultural land without direct production requirements to receive the support.
Cap pillar I: Additional payments (Regulated at European level and implemented at national level)	The cattle support will support and influence the interest in milk and meat production in Sweden. There is also support for farmers who are 40 years or younger and who have started an agricultural business for the first time.	Grants for cattle equivalent to about SEK 900 per animal.	About SEK 500 million per year. (500 million of the total farm subsidy) Sweden has allocated 13 percent of the farm subsidy budget to an animal grant for cattle older than one year, the so-called cattle subsidy.	Incentive	

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Policy	General Policy Objectives	Instruments	Objectives Instruments	Type Instrument	Claimed impact in Sweden
Cap pillar II: Environment	Aims to support the sustainable economic, ecological and social development of the countryside in Sweden. The money for the support in the rural program comes from both the EU and Sweden.	When farmers grow and manage their land in a way that is good for the environment, they can apply for environmental compensation. The environmental benefits are included in the rural program 2014-2020 and help to achieve the goals of Europe's Europe 2020 growth strategy.		Incentive	The rural program has played a major role for the environment in Sweden.
Cap pillar II: Productivity	The goal of the rural program is to develop agriculture and countryside to create an attractive countryside.	• investment support for rural businesses • prerequisite support for business and industry • support for quality of life and social interaction in rural areas and LEADER measures • general environmental support focused on biodiversity • selective environmental support targeted at biodiversity		Incentive	Less-favoured areas: Maintaining an open and active cultivation landscape and counteracting the abandonment of agriculture, Landscape's natural and cultural values: To open and varied the landscape with its diversity of biological and cultural-historical values Eco-friendly agriculture: Reducing the negative environmental impact of agriculture and increasing resource efficiency
Cap pillar II: Rural development	The goal of the rural program is to develop agriculture and countryside to create an attractive countryside.	• investment support for rural businesses • prerequisite support for business and industry • support for quality of life and social interaction in rural areas and LEADER measures • general environmental support for biodiversity • selective environmental support for biodiversity • selective environmental support for nutrition		Incentive	Less-favoured areas: Maintaining an open and active cultivation landscape and counteracting the abandonment of agriculture, Landscape's natural and cultural values: To open and varied the landscape with its diversity of biological and cultural-historical values Eco-friendly agriculture: Reducing the negative environmental impact of agriculture and increasing resource efficiency

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Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of Instrument	Claimed impact in Sweden
The Nitrate Directive (Regulated at European level and implemented at national level)	The Nitrate Directive aims to protect water quality throughout Europe by preventing nitrates from agricultural sources that contaminate soil and surface water	The so-called sensitive areas must be reviewed every four years in order to take into account new conditions, for example if the levels of nitrate in rivers and lakes have changed.		Regulatory instrument	The Nitrate Directive specifies three different criteria for listing contaminated waters. The land areas that run into these waters are designated as sensitive areas. For surface and groundwater, it is stated that the content of nitrate must not exceed or risk exceeding 50 mg/ litre. This has not been measured at any place in Sweden.
Habitats Directive (Regulated at European level and implemented at national level)	The Habitats Directive aims to ensure the conservation of a large selection of rare, endangered, endemic animal and plant species	The overarching goal of the Species and Habitats Directive is for the designated species and habitats to reach a defined favourable situation, also called "Favourable Conservation Status". Sweden also has as a national environmental goal to achieve favourable conservation status for Sweden's nature		Incentive instrument	Sweden has an obligation to preserve the species and habitats covered by the EU Habitats Directive. One of several obligations in the directive is the reporting on the conservation status of these species and habitats that is carried out every six years.

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Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of Instrument	Claimed impact in Sweden
EU Climate Change Adoption Strategy (Regulated at European level and implemented at national level)	By 2050, the EU wants to reduce emissions by 80-95 per cent compared with 1990 levels as part of the industrialized countries' efforts. Transforming the EU into an energy-efficient and low-carbon economy will also strengthen the economy, create jobs and promote competitiveness.	Working with climate targets, the EU combines financial support with legislation.		Incentive instrument	Financial support; legislation; climatization
The Swedish Board of Agriculture's description of regulation, regarding the consideration of natural- and cultural values in agriculture. (A Swedish national policy)	Available to protect the habitat of the wildlife of the agricultural landscape. They are also used to preserve cultural heritage.	Some landscape elements may not be removed or damaged if they have cultural-historical values or are valuable to the plants and animals of the cultivated landscape.		Regulatory instrument	The mechanisms that contribute are that consideration must be shown, among other things, in the decommissioning and new cultivation of land, in soil dewatering or in order to spare, for example, arable islands, cultivation rows, stone rows, wetlands, stonewalls and smaller tree stocks.

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Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of Instrument	Claimed impact in Sweden
Cattle grazing and outdoor living (A Swedish national policy)	Cattle should be kept outdoors during the summer in Sweden. The reason is that a large part of the animal welfare depends on the possibility of natural behaviour and being able to move freely.	There are different rules for cattle depending on whether the animals are kept for milk or meat production; broken down by region		Regulatory instrument	
Agricultural support for farmers in Norrland (Northern Sweden)	Money is paid to farmers in Norrland (mainly dairy farmers)			Incentive	Without the support to farmers in Norrland, as many as 40% of dairy farmers in Norrland would make zero profit or red numbers
Nature reserve (in addition to those in Natura 2000)	Nature reserves are one of the most common ways of protecting valuable nature in the long term. The nature reserves make up a very large area in Sweden that is protected with the support of the Environmental Code.	There are 3500 nature reserves in Sweden. Nature reserves often consist of interconnected valuable nature, which can include both forest, waterways, open cultural landscapes and marshes. In total, about 85 percent of all the area with the Environmental Code is protected in Sweden		Regulatory instrument	Sweden's land area is 55 per cent of forest. A large number of nature reserves consist of forests, from the birch forests of the mountains over the old coniferous forests of Norrland to the noble deciduous forests of southern Sweden. Despite this, only about 1.5 percent of the forest is a nature reserve.

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Policy	General Policy Objectives	Instruments	Objectives of Instruments	Type of Instrument	Claimed impact in Sweden
The Environmental Code's rules of consideration	The general rules of consideration are the basis on which the Environmental Code rests. The rules mean that everyone must always be careful and take the necessary measures to protect, prevent, prevent and counteract the risk of injury or inconvenience to health and the environment.	Proficiency; precautionary principle; product selection principle; The housekeeping and cycle principle; location principle; plausibility assessment.		Regulatory instrument	

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4.2.4.4.3 Policy logic

Consistent with the other groups, we used the Cascade Framework as a reference to illustrate and analyse the policy logic. Of the policies that were reviewed, there is a clear and homogenous policy logic at play in Sweden. Policy instruments, mostly subsidies and regulations, are used to influence landscape management. Using the cascade framework logic, this suggests that in targeting landscape management, the structure and composition of the landscape is directly influenced by the landscape management decisions. Indirectly, and through the structure & composition, this influences the functions that are possible on the land. (See path "1" in figures 41 - 43 below) Continuing with the cascade logic, the functions that are possible facilitate some and preclude other ES. Depending on which ES are produced and whether there are benefits, these ES may be valued and eventually increase regional competitiveness.

The policy logic just described "indirectly pushes" the flow of certain ES. It is very different from the cascade framework logic that follows path "2" and "3". For example, a policy logic that targeted the demand for services (path "2") would, at least in theory, directly lead to greater benefits for producing an ES, such as provisional services like milk, cheese, or beef. This type of logic targets consumers of ES rather than producers of ES (i.e. farmer or land manager). Similarly, path "3" targets specific ES services with e.g. direct payments for things like milk, cheese or beef. With this logic, there is a combination of supply side influence and pull towards certain ES. The policy logics identified in Sweden are illustrated in the Figures 41-43 using the Cascade Framework below.

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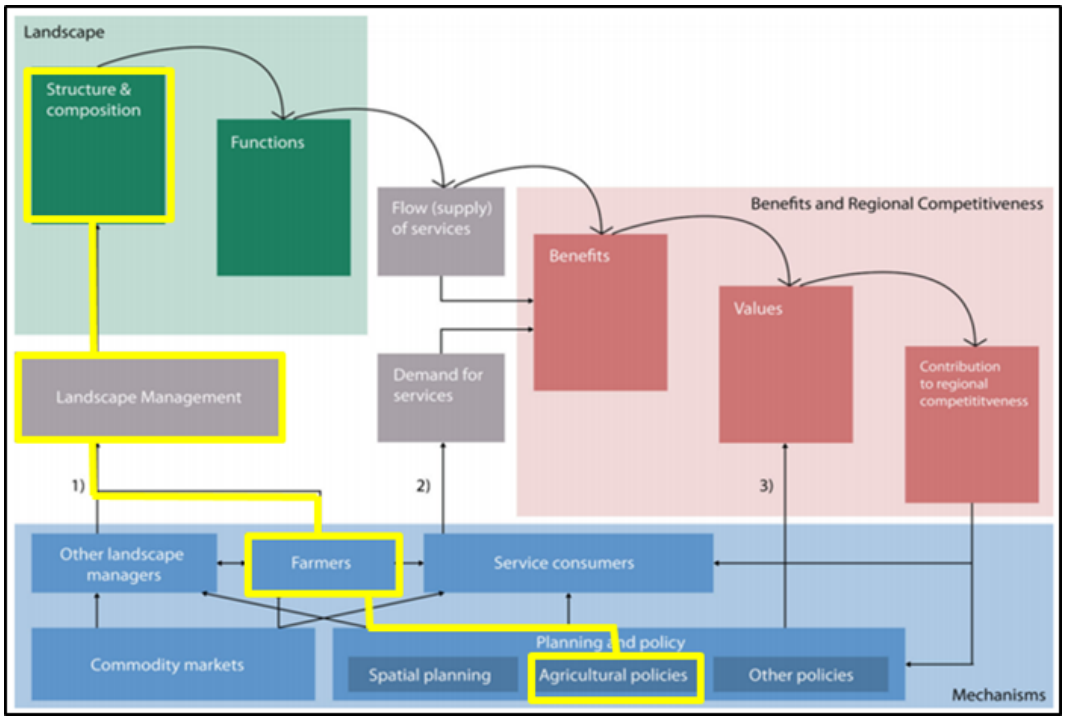
Figure 41.Diagram of policy logic for agricultural policies in Sweden.



Policy	Instruments	Type of instrument
Cap Pillar I	Basic payment	Incentive and regulatory
Cap Pillar I	Greening	Incentive and regulatory
Cap Pillar I	Additional payment	Incentive
Nitrate Directive		Regulatory
Agricultural support for farmers in Norrland		Incentive
The Swedish Board of Agriculture's description of regulation		Regulatory
Cattle grazing and outdoor		Regulatory

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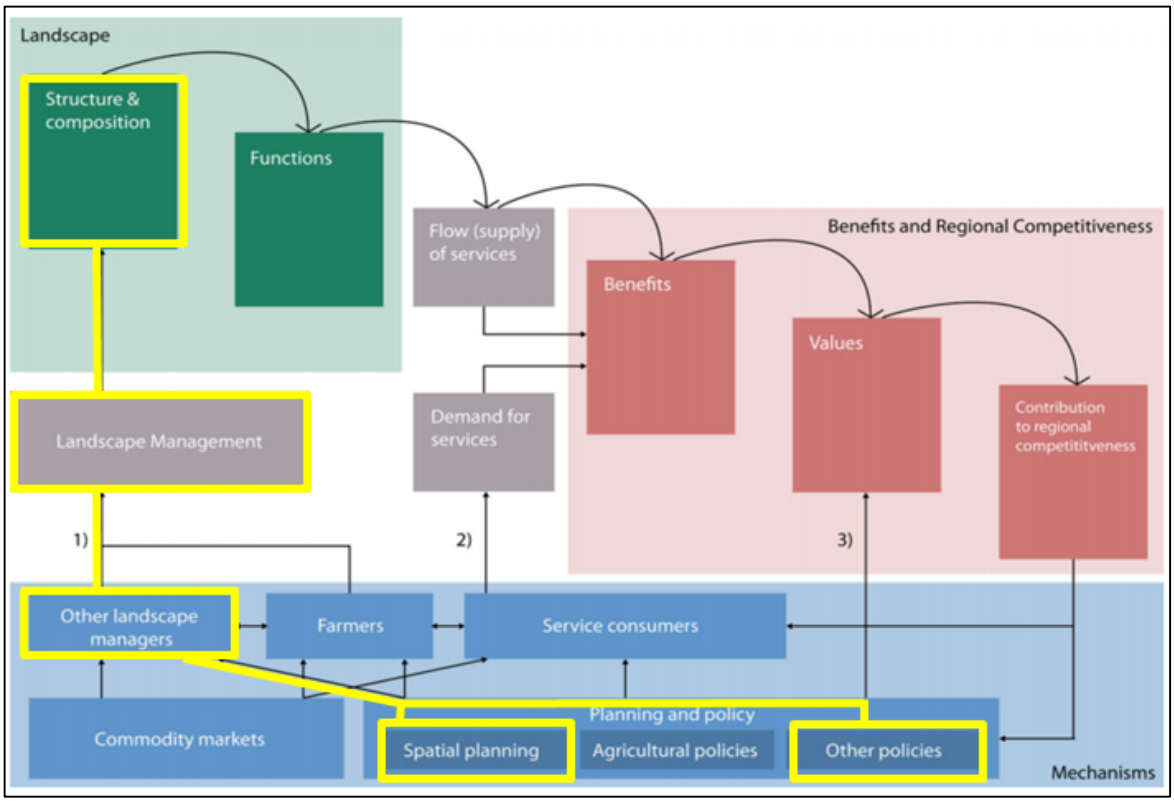
Figure 42. Policy logic for payments for ecosystem services.



Policy	Instruments	Type of instrument
Cap Pillar I	Environment	Incentive
Cap Pillar I	Productivity	Incentive
Cap Pillar I	Rural development	Incentive
Habitat Directive		Incentive
Nature reserve (in addition to those in Nature 2000)		Regulatory
The Environmental Code's rules of consideration		Regulatory

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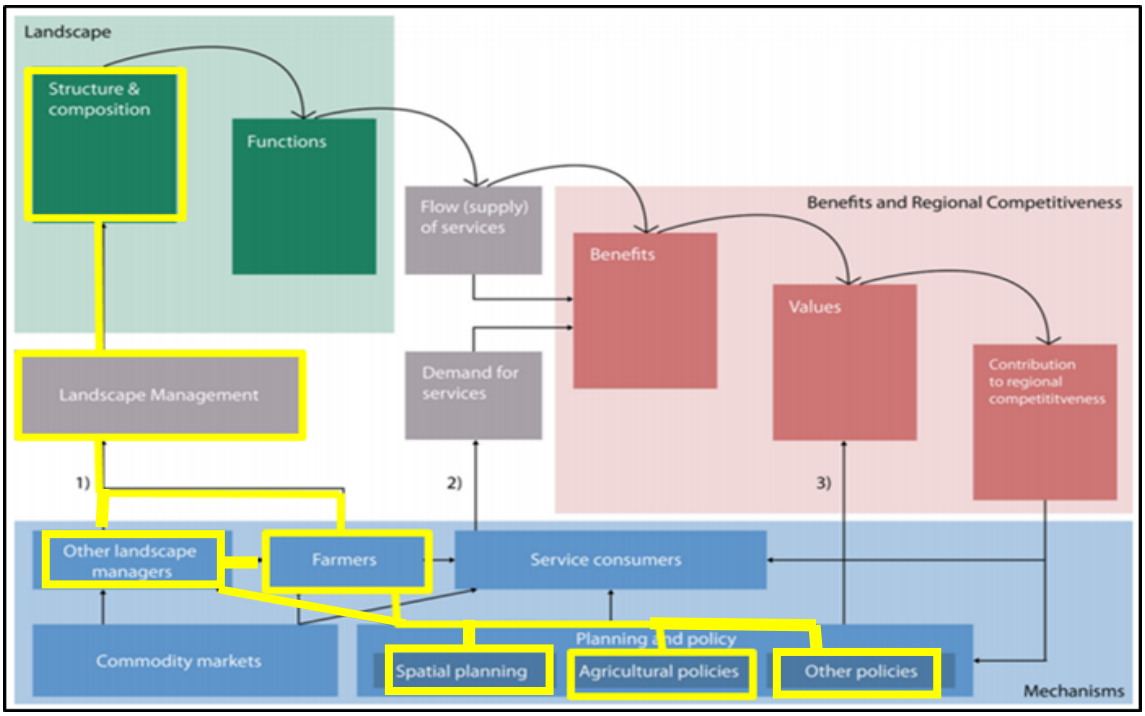
Figure 43. Policy logic of multiple policy types affecting farmers and other landscape managers.



Policy	Instruments	Type of instrument
EU Climate Adaption Strategy		Incentive and regulatory

4.2.4.5. Stakeholder understanding of policy effectiveness

4.2.4.5.1. Data collection

The information gathered using the PAT (see Table 21 above) was supplemented by interviews with policy stakeholders. The selection of stakeholders was carried out using similar methods as were used for the recruitment of the expert panel with one important difference. Instead of just trying to identify the most "expert" stakeholders, we ensured that at least one stakeholder was included that represented academia, the national government, farmer interest groups and special/public interest groups.

Our search resulted in a range of institutions and names for interviews. A process of self-selection occurred after initial contact with these institutions so that the most suitable persons (i.e.

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knowledgeable and involved in the area and capable of speaking for their institution in most cases) for interviews came forward. In total, 11 interviews were carried out with the following stakeholder groups:

- Academia (n=2)
- National government (n=2)
- Regional government (n=1)
- Farmers interests (n=4)
- Special/Public interests (n=2)

The 11 interviews were conducted in May and June 2019. All the interviewees consented to the use of audio recordings.

4.2.4.5.2. Key messages

Before presenting the results of the main interview themes (relevance, legitimacy, democracy, efficiency, and effectiveness) a few words are in order regarding our participants. There were large differences in how knowledgeable each group was on the topic of grassland policy. Representatives from the national government had a holistic overview of the policies reviewed in this report, including the strategic thought behind them. As might be expected, the experts representing academia had deep, technical understanding of the challenges facing permanent grasslands—however their perspective and interests were slanted towards the natural sciences. The four stakeholders representing different farmer interest groups were highly variable in their knowledge about permanent grassland policy; ranging from deep understanding to only practical experience working with grassland management and policy compliance. Surprisingly, the most difficult stakeholder group to find knowledgeable representatives from were NGOs who have a stated interest in representing the public interest.

Knowledge asymmetry among stakeholders should be expected. What surprised us, however, was the reason for the asymmetry. We came away with the impression that some of the NGOs in Sweden who ought to be more knowledgeable about permanent grasslands and the policies that affected their stakeholders were not because they trusted in government.

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Some general observations from the interviews were that most of the stakeholders in Sweden believe that the Swedish policies in place are highly relevant, however CAP I & II are the most important. Not only are the policies in place believed to be important, farmers are ok with e.g. environmental objectives and grassland management constraints as long as they do not interfere with competitiveness and profitability. One of the constraints that surfaced repeatedly was complexity. There is a strong belief among farmers that the policies are too complex, the rules too difficult to follow and often too many hurdles to overcome to be compensated. Consequently, many farmers do not bother to apply for compensation even if they are entitled. There is also a belief that the compensation has not always gone to those most deserving—however this and other problems of complexity will resolve themselves with the new CAP reforms.

Emphasis from farmer's organizations was placed on simplifying complexity so that those who are entitled receive compensation and that they get it on time. Farms organizations are excited about the new CAP reforms, as they believe issues of complexity will be resolved and the reforms give them more flexibility to control how money are distributed. However, farmer's organizations are not as keen on releasing control of subsidies to other areas. For example, when asked if money should be redirected to increasing demand for ecosystem services (e.g. promoting labels for Swedish food products) the response was less than positive. Instead, they want to limit as much as possible the formal requirements on farmers and trust them that they spend the money wisely.

A couple of organizations representing the farmers think that it should be 'more carrots than sticks' for the farmers. The contemporary EU-policies are considered too harsh for the farmers.

One researcher believes that a solution to the problems with permanent grasslands in Sweden could be to optimize agricultural subsidies (move money to targeted pasture compensation). Reintroduce support for cultural environments (stone walls, non-arable outcrops). Introduce earnings and value-based environmental payments. Then they would, for example, be able to remove CAP I. The same researcher thinks that if the cultivation landscape with its pastures and meadows should live and develop positively requires enhanced efforts. Meadows and pastures are highly valued. The population's willingness to pay for it is high. The researcher believed that it is economically profitable to promote permanent grasslands further.

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According to one person representing a farm organization, the basic problem is the closure of farms and pastures. In addition, there is an aging crisis among farmers in Sweden, which struggles with poor profitability in pasture-based beef breeding. This leads to fewer pastures and increased fragmentation in the landscape. In order to preserve the biodiversity of these ancient cultural lands, there must be connections between different pastures, so that insects and birds can spread and meet, thus keeping the gene pool alive, and not be isolated. The problems are exacerbated by increased forest planting and spontaneous overgrowth with shrubs on the permanent grasslands.

From the democratic aspect, one researcher believes that as a citizen we can participate in influencing society's priorities using our voting rights in general elections and through our participation in the democratic conversation. As consumers, we can choose to buy meat from natural pastures and pay in the store for the product's added value in the landscape in which it is produced. As members of the community, we can choose to engage in nature conservation associations and other contexts where voluntary efforts are made to safeguard valuable culture.

These are only some of the themes that emerged during the stakeholder interviews. In Table 22, we provide a summary of the key messages each stakeholder provided with respect to policy relevance, democracy, legitimacy, efficiency, impact, unexpected consequences, desired changes and other interesting aspects. To protect the identity of the individuals' interviews, we have excluded the name of their organization and only provide information on the stakeholder type they represent.

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Table 22. Summary of Swedish Stakeholder Interviews

Stakeholder Type	Farmer Interest (general)
Relevance	Of the belief that the Swedish policies in place are highly relevant—however CAP I & II are the most important.
Democracy	Highly involved in discussing new policy proposals on the Swedish and EU level. They feel their interests are being listened to and often implemented. LRF is often invited to participate. LRF has a Brussels office. They participate in lots of reform discussions.
Legitimacy	The policies in place are believed to be important. Farmers are ok with e.g. environmental objectives and grassland management constraints as long as they do not interfere with competitiveness and profitability.
Efficiency	Less knowledgeable on this aspect. However, there is a strong belief among farmers that the policies are too complex, the rules too difficult to follow and often to many hurdles to overcome to get compensated. Consequently, many farmers don't bother to apply for compensation even if they are entitled. There is also a belief that the compensation has not always gone to those most deserving—however this and other problems of complexity will resolve themselves with the new CAP reforms. Production and Environment balances between both. "Sweden's 60,000 farmers see things differently" .Economy and profitability are the most important.
Impact	It is worth the money, it is at a reasonable level. Without the money we would get a closure of the grasslands. Without the farmers we would have to invest more money if we want permanent grasslands in Sweden. Essential for financial viability for most farmers in Sweden. Not sure how well the environmental or climate objectives are being met.
Unexpected Consequences	The farmers we forced to plow long-lying grasslands. The farmers must plow up the soil earlier then they want to be able to get support from the EU.
Desired changes	Emphasis was placed on simplifying complexity so that those who are entitled receive compensation and that they get it on time. LRF is excited about the new CAP reforms as they believe issues of complexity will be resolved and the reforms give them more flexibility to control how monies are distributed. Advisers, authorities, entrepreneurs could share more knowledge. LRF would like to see more new technology initiatives.
Other interesting aspects	LRF is not keen on releasing control of subsidies to other areas. For example, when asked if money should be redirected to marketing ecosystem services (e.g. promoting Swedish Label for Grass-fed beef) the response was less than positive. Instead, they want to limit as much as possible the formal requirements on farmers and trust them to spend the money wisely. LRF thinks it is a good thing we have a discussion about grasslands. The Swedish Board of Agriculture has proposed simplification. The national food strategy is important. Some of the environmental requirements have become quite complicated for the farmers.
Stakeholder Type	Government (environmental interst)
Relevance	Believes that the policies are highly relevant. The Swedish Environmental Protection Agency is a strong supporter for agriculture in Sweden. "We depend on agriculture". Direct environmental support is important for them.

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Democracy	"We want more influence in the NEW CAP, it is not always that the Swedish Board of Agriculture consults us."
Legitimacy	The policies in place are believed to be important. But they want better compliance between nature and agriculture.
Efficiency	"Without the agricultural support we would not have any agriculture left in Sweden". "The greening aid could be made more efficient". They want multifunctional supports - multiple goals that are met in the same support. It is complicated to administer the supports. "More carrots instead of sticks for the farmers". The Swedish Environmental Protection Agency want a better compliance between nature and agriculture.
Impact	The agricultural program plays a big role but could have been better designed. Investment support is important. Nature directive - measures are good. Outbreeding for cattle - biodiversity for the animals, they think it could be better developed.
Unexpected Consequences	Too much trees in permanent grasslands in Sweden (EU regulation). Sweden had to pay a fine to the EU for this.
Desired changes	"There should be greater flexibility for the farmers - such a level of detail of rules that exist today is sometimes not justified."
Other interesting aspects	“Agriculture is incredibly important and valuable. We want it to be more positive for farmers. "
Stakeholder Type	Government (national)
Relevance	They think that the policies are very important. Sweden must comply with EU directives. The Norrland support is important, but there is not much grassland in Norrland. The Swedish Board of Agriculture's considerations of importance (Jordbruksverkets hänsynsföreskrift) are important. It is important to achieve Swedish environmental goals.
Democracy	They submit proposals for action. But the politicians in the Parliament and Government make the decisions.
Legitimacy	Grasslands are a central part of the cultivation landscape. There is a great consensus that grasslands are important. But there are tensions between farmers and natural values. Production and nature conservation do not always go hand in hand. Agriculture can contribute to high natural values. "The production aspect is not sufficiently developed, the natural values weigh over"
Efficiency	They believe that without the farm support, we would lose half the herd of livestock in Sweden. We would lose grasslands otherwise unless the farm support (CAP 1) wasn't available. Modeling when it becomes profitable to manage the grasslands is available. They use business economics models on profitability. They think that it should be more focus on nature conservation advisors to farmers.
Impact	New CAP might solve some problems. Member States are more self-determined within the new CAP. They think it is very positive.
Unexpected Consequences	Too much trees in our grasslands, sanctions from the EU.
Desired changes	They are calling for more environmental indicators. Now the indicators are mostly birds. More indicators could be developed in Sweden. Better monitoring. Improve the regulations regarding policies and cash payments. Performance-based remuneration could be introduced. Raise the compensation levels to the farmers. Better regulations for money payments.

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Other interesting aspects	"The NGOs trust the authorities where the money goes" "Without EU support, Swedish agriculture would not have looked the way it does today."
Stakeholder Type	Farmer (grassland)
Relevance	Calling for more knowledge from other countries. Wants practice and theory to meet. Today there are too theoretical solutions to the problems. They want more knowledge transfer - researchers should research the right things.
Democracy	
Legitimacy	The policies are believed to be important. But we have less grassland in Sweden now. The farmer who takes care of the grasslands receives almost no money from CAP. Instead, the landowners get the money. They think it is a problem.
Efficiency	Wants more counseling for the farmers. Wants more money for the production to the farmers. The investment support is too complicated today. Delayed payments to the farmers is a big problem (some farmers have been waiting for several years). Send information to the public about the importance of grasslands.
Impact	Several negative consequences for the farmers. The farmers are often controlled. The cross-compliance is too complicated. "Many decisions they (the farmers) should live up to" Many farmers do not seek support because it is too complicated. During a check, a farmer was deducted because the farmer forgot to ear tag a calf. It is hard for the farmers to be constantly controlled.
Unexpected Consequences	E.g. During a check, a farmer was deducted money because the farmer forgot to ear tag a calf. It is hard for the farmers to be constantly controlled.
Desired changes	Research and knowledge are important. They want to combine research more with practice. Want to work more together with other associations. No sense in reinventing the wheel. Involve other associations with and work together.
Stakeholder Type	Farmer (cattle grazing)
Relevance	Want to spend much more money on the grasslands. Thinks that the policies are good but they are not enough.
Democracy	They are often referral body. They are involved, they can influence decisions.
Legitimacy	They know and appreciate the values of the grasslands. Want to raise the general support for the grasslands. Think it's worth spending a lot of money on grassland. The policies currently in place have not been sufficient.
Efficiency	Think that it has been difficult to administer the supports. They are too complex.
Impact	About the greening aid: there are no indicators that it has been efficient. More difficulties for farmers. They believe that a lot of money goes to consultants instead of the farmers. About compensatory aid: The money must be paid on time! That has been the biggest problem over the past 5 years.
Unexpected Consequences	Swedish farmers have been fined by the EU for having too many trees in Swedish grasslands (pastures).

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Stakeholder Type	Academia (policy)
Relevance	About the grasslands: “The socio-economic benefits are greater than what is paid today." "More money would be needed to the permanent grasslands."
Democracy	"The Swedish Board of Agriculture holds a position of power in Sweden."
Legitimacy	The policies are believed to be important. But..."Farmers are negatively towards the authorities."
Efficiency	"Single farm payment as income support is ineffective."
Impact	About the different policies: The Swedish Board of Agriculture's Regulations on the consideration of natural and cultural values in agriculture. Important for the grasslands, but there is potential to develop them further. Grazing and Eating for Cattle Important, but could be refined in its design. Nature reserve (in addition to those in Natura 2000) is about considerably smaller areas. Often, funds for the management of the reserves are lacking, so that their claim becomes worse. Landowners lose availability and the overall result can deteriorate. Expensive to manage with public employees, cheaper with compensation to landowners. However, some top items may be necessary to ensure protection. Consideration rules in the Environmental Code Good, but these could also be strengthened. To be seen in relation to the cross conditions and the Biotop Protection Act. Production counseling is indirectly important, but there is also counseling directly on good management of grasslands to promote biodiversity which is important. There are not so much permanent grasslands and other permanent pastures left in Norrland, so therefore not as important for the grasslands. For those who live in Norrland, after all, the support is important.
Unexpected Consequences	Trees in pasture, SEK 700 million in fines from Brussels. Brexit? That is a fate question, there will be less money if the UK leaves the EU. There must be a willingness to pay for the permanent grasslands.
Desired changes	Wants to raise the goals of the grasslands. And wants to give more resources to the permanent grasslands (more money).
Stakeholder Type	Special Interest (nature conservation)
Relevance	Natura 2000 is very important. The farmers should receive more money for the grassland management.
Democracy	They are sometimes invited by the county to discuss more local policies.
Legitimacy	It is important for farmers and the public. Thinks that there is little public knowledge about permanent grassland.
Efficiency	The agricultural program is important. It is very important. Thinks that the compensation of grassland should be increased. Administration for policies is too high / too much of the budget. There are too much details about the policies. Authorities should push more for locally produced meat. "Animals on pastures are not climate negative."
Impact	"The single farm support does not contribute to biodiversity." "Sweden interprets the policy rules too harshly." "There are unique fields that Sweden can tell that exists" (for the EU) Thinks that much of the problems are on a national level.
Unexpected Consequences	Swedish farmers have been fined by the EU for having too many trees in Swedish grasslands (pastures).

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Desired changes	Breeding animals on natural grasslands and wetland areas in the summer, the use of fertilizer is reduced and thus the eutrophication.

Stakeholder Type	Special Interest (environmnet)
Relevance	According to them are all policies are relevant. No one particular.
Democracy	They are not often invited to discuss policies.
Legitimacy	The policies are believed to be very important. But they think that the subsidies should be larger, more money should be spent on permanent grasslands.
Efficiency	Thinks that the area of permanent grasslands in Sweden has reduced dramatically today only scattered fragments remain. The effects of landscape transformation on biodiversity are equally extensive.
Impact	The compensation for permanent grasslands is considered too low. Thinks that higher subsidies should be increased for the people involved in grasslands management. They think that people should eat meat from cows, grazing on permanent grasslands.
Desired changes	Thinks that higher subsidies should be increased for the people involved in grasslands management. They think that people should eat meat from cows, grazing on permanent grasslands.

Stakeholder Type	Government (regional)
Relevance	Of the belief that the policies are important. Environmental targets. Food Strategy. Controls. The purpose is good. But on farm level is not always good. Other forms of compensation, such as environmental compensation is a little rigid designed.
Democracy	They are participating in several forums.
Legitimacy	They meet a lot of animal keepers. Biological diversity is important. Climate issues. Animals are needed, they are important for the grasslands.
Efficiency	The money that makes us have grassland is very important." It is a little money compared to other items we have in society. That is justified!"
Impact	Single farm payment decreases. About single farm payment: "Calls for a more flexible form of compensation." Good form of compensation if they could make it flexible. Rural program compensation has become more flexible in recent years. Lacks a varied openness that does not have as much production. If the combination of farm support environmental allowances would be better if the environmental allowances were purified. "Compensation levels could be a little more equal so that it is not premium to have open land compared to land that has trees and shrubs." The rural program is very valuable. It is the key to getting major restorations started. Important for long term claim. It has contributed to many special solutions (involving fencing and gates). Too much administration, many pitfalls. It's too hard and complicated to get money. Calling for people to work a little easier together. The Swedish Board of Agriculture considerations of regulation - the purpose is good. But could work more "outreach". Work in a different way.

Stakeholder Type	Academia
Relevance	Collaborate between authorities and groups. The whole, Knowledge, nature, environment, society, recreation issues, broader concept. Maintain the grasslands. They are needed for biodiversity.
Democracy	Collaboration consensus. Focus on what works in the fields. Don't set any unreasonable rules. Calls for dialogue and conversation.

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Legitimacy	If the policies disappear, we would get rid of a lot of grassland. Farmers and farmers have other motives than just making money from it. Hard to just look at a budget cost, everything is relative.
Efficiency	According to the EU too much trees on pastures. The natural history values and the ecological values disappear if farmers cut down the trees. Should conduct dialogue calls for competence. Want a decentralization.
Unexpected Consequences	Important challenges. The grasslands must be seen as a unit. The grassland are important for the people.
Stakeholder Type	Farmer (ethical production)
Relevance	Ethical - human values are important. But production capacity and productivity are the most important. Want to remove the single farm payment and want to introduce grassland subsidies that exist in other EU countries. Spend more money on ecosystem services.
Democracy	Not at present
Legitimacy	Part of the organization is that. Competence about rules exists but not about biodiversity. For the organic farmers the rules laws and the market are important.
Efficiency	Support to keep the fields open. But instead of single farm payment, grassland support (vallstöd) should be introduced. "Some farmers receive money from the EU to cut the grass"
Impact	Wants meadow support (vallstöd) instead of single farm payment!

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4.2.5 UK – Atlantic BGR

4.2.5.1 Characteristics and distribution of permanent grassland in UK

4.2.5.1.1 Extent of permanent grassland in UK

In the United Kingdom (UK), grasslands represent over two thirds of agricultural land area. In 2018, the proportion of utilised agricultural land used for grassland was 71%, with 27% used for crops (Defra et al., 2019). Grassland areas in 2018 included 1.2 million ha of temporary grassland (<5 years old), 10.2 million ha of PG (>5 years old) and 5.1 million ha of rough-Grazing (Defra et al., 2019). In 2018, this grassland supported 9.9 million cattle and calves, approximately 1.6 and 1.9 million animals for the beef and dairy sectors respectively, as well as 34 million sheep and lambs. PG areas also create and help maintain biodiverse environments, and the value of wildflower-rich semi-natural grassland is well recognised both in view of its intrinsic biodiversity value and the ES (Pinches & Chaplin, 2014).

Table 23. Change in PG area in the UK (sources: UK Agriculture departments June Survey/Census of Agriculture/ AF land data Scotland (Defra et al., 2019).

(thousand ha)	2014	2015	2016	2017	2018
Total PG	**9.755**	**9.880**	**10.079**	**10.138**	**10.072**
Grass over 5 years old	5.824	6.078	6.118	6.135	6.178
Sole right rough grazing[26]	3930	3801	3961	4003	3895

Trends in the area of PG in the UK have fluctuated over recent years. Table 23 shows the change in PG area in the UK between 2014 and 2018. There has been a small increase in PG area annually until 2018, when the total area decreased by approximately 1% to 10.072 million ha. Figure 44 shows the change in PG area between 2006 and 2017 by UK country. England has the largest share of PG in the UK and NI the smallest. The trends in all countries are very similar, showing a small incline towards 2009, a fall towards 2015 and plateau towards 2017.

[26] Also includes mountains, hills, heathland or moorland.

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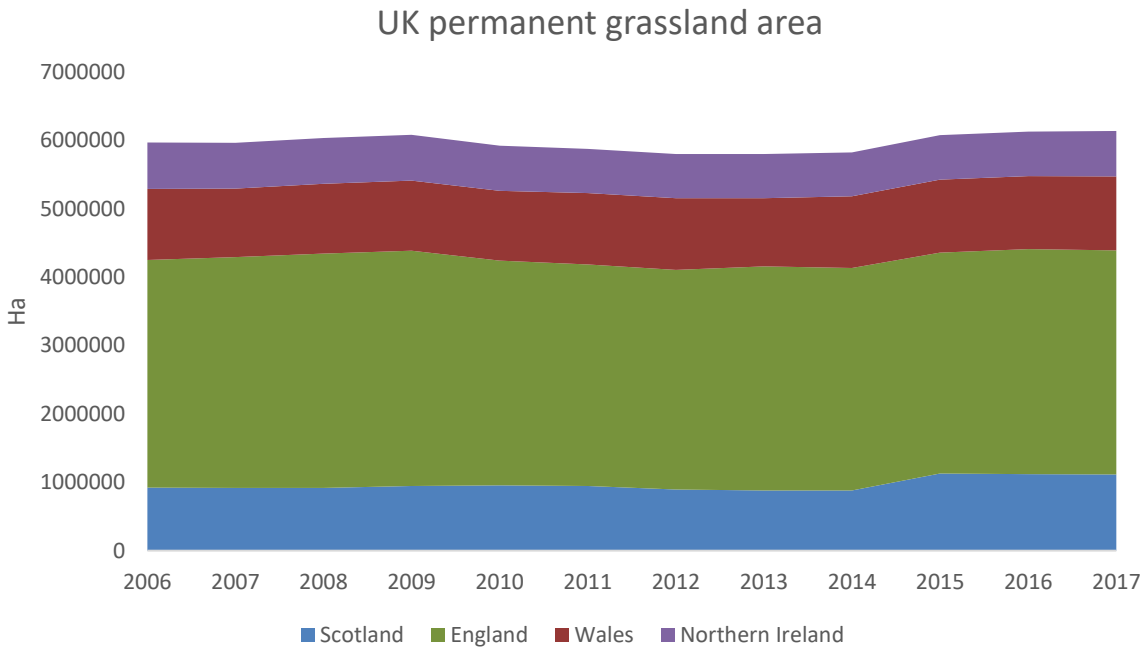
Figure 45 shows the extent of managed grassland in the UK, which includes all types of grassland including PG. This shows that much of the managed grassland is located in the West of the UK, concentrated in Wales, SW England, lowlands in Northern England and central Scotland and to the North East lowlands in Scotland. The wetter climate of the West restricts arable agriculture, which thrives in the East of England in particular. PG can vary from productive grassland for intensive livestock to unimproved species-rich grassland.

Figure 44. Change in PG area in the UK.



Source: Scottish Government, 2018[27].

[27] Scottish Government (2018) Crops, grass and rough grazings for each United Kingdom country, June 2000 to 2017, available online https://www2.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/PubEconomicReport/TimeSeries/ERSAC2 [accessed Aug, 2019].

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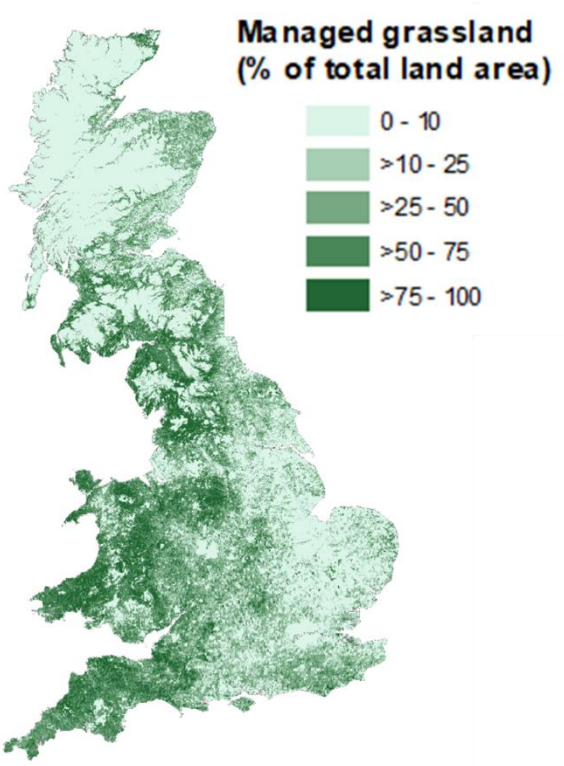
Figure 45. Extent of managed grassland in England, Wales and Scotland (including PG and temporary grassland).



Source: ADAS.

PG areas are often threatened by conversion to cropland. In a Natural England study of PG losses in England between 2007 and 2014 (Pinches & Chaplin, 2014), the influence of sector on changes in area of PG was recorded. The biggest decrease in PG between 2012 and 2013 was seen on dairy farms (3000 ha). This was attributed to farms often holding a mix of PG and cropped land. Most of the decrease in PG was seen to be in the livestock areas in the west, rather than the arable east. Cereals farms were reported to have the highest increase in PG. Areas of permanent pasture suitable for cultivation had already been ploughed in 2008 on most cereals farms, leaving only small, steep or poor fields in permanent pasture limiting opportunity for further loss. The study stated that the increase might be attributable to some farms classified as cereal being mixed enterprises, which may have had temporary grassland that has reached 5 years old, or areas of set-aside or land in other classifications that has now moved into the permanent grass category. By contrast, the Natural England study reports that dairy farms retain large areas of grassland and were seen at the time to be looking to find ways of reducing very high feed costs. Hence ploughing the better permanent pasture fields for fodder crops

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is an attractive option. In such conversions, it is likely that the pasture fields lost are not of high biodiversity value. However, there are issues within environmentally sensitive PG.

Environmentally important PG exist across the UK. Some exist under the protection of Article 17 of the EU Habitats Regulation and are protected through designation of Sites of Special Scientific Interest (SSSI) status. Priority habitats that fall within the understanding of PG include lowland and upland habitats such as meadows, hay meadows, rush pastures, acid grassland, calcareous grassland, and Calaminarian grassland (JNCC, 2016). Loss of such areas of grassland is an important issue, and although overall losses are relatively small, they can be significant for small scale, rare habitats, such as upland hay meadows for example. In relation to threatened lowland semi-natural grasslands, Critchley et al. (2004) have highlighted that in England and Wales, 97% of enclosed unimproved grassland was lost between 1932 and 1984 (Fuller, 1987). Now only 1–2% of the cover of permanent lowland grassland supports plant communities of high conservation value (Blackstock et al., 1999). Where semi-natural grassland remains, it has become fragmented and declining in condition, particularly marked in terms of farmland birds (Chamberlain et al., 2000, Vickery et al., 2001), vascular plants (Rich & Woodruff, 1996) and various insect groups, especially butterflies (Asher et al., 2001). Although there have been subsequent improvements in grassland management for biodiversity and habitat value, the management picture is complex, and there are still struggles and trade-offs (Pakeman, 2016).

Where grassland may be considered 'environmentally important' (other than for designated sites), there is no requirement to assess changes in the extent of grasslands. These may be species-rich, semi-natural or semi-improved, but which may not meet priority status. It may be land adjacent to designated sites or close to watercourses. There are fewer ways of recording the health and extent of such areas. However, data from the applications made under the Environmental Impact Assessment (EIA) (Agriculture) regulations give information about the requests to intensify or convert semi-natural areas. According to Natural England data from 2002 – 2012 the applications increased. In 2012, 234 applications were received compared to an average of 128 in the previous 10 years. Applications to August for 2013 were 163 compared to 180 up to August 2012 (Pinches & Chaplin, 2014). Whilst the number of applications does not directly indicate loss of environmentally important grassland, it does serve as an indication of farmer's intentions, and by proxy level of potential threat. Within the UK there are often issues with PG areas that do not fit within the criteria for the EIA regulations (e.g.

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smaller than 2ha), and as a result valuable habitats are at risk of being lost without record. Areas are also under threat when certain agri-environment schemes expire, thereby removing the stipulation to manage or maintain PG.

In relation to changes in PG in recent years in relation to environmental pressures, a report on the state of UK Agriculture (Defra et al., 2019) describe that the key drivers of change in terms of environmental pressures from agriculture are declines in the number of livestock, specifically ruminants, and reductions in fertiliser applications, particularly on grassland. The report also highlights that reforms to the Common Agricultural Policy, in particular the decoupling of subsidy payments from production, have been instrumental to these drivers of change. These reforms have resulted in agriculture in the UK that is much more responsive to market conditions, which may influence both positive and negative environmental impacts.

4.2.5.2 Key challenges of threats

4.2.5.2.1 Pressure to intensify

Despite a focus of new legislation on environmental and public goods in agriculture, there is still a recognition of a need for increasing production and the pressure to intensify. This might be currently manifesting in a push for sustainable intensification, but may still have consequences for PG, particularly as an approach to sustainable intensification has not yet been confirmed in the UK. Intensification of grassland productivity can happen by manipulation of both primary production and stocking density, and leads to complex responses in terms of environmental impacts (Soussana & Lamaire, 2014). For example, as intensification increases, positive impacts, such as C sequestration are overtaken by impacts linked to nitrogen issues, biodiversity loss etc. Hence, in each unique environmental setting, a threshold level of grassland intensification can be determined above which any additional animal production would be associated with unacceptable environmental risks (Soussana & Lamaire, 2014). The debate will continue to seek to balance the arguments for intensifying production with those for incorporating wider sustainability criteria into land use planning, with potentially unknown consequences for PG (Hill, 2017; Medina & Potter, 2017).

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4.2.5.2.2 Lack of options for non-designated semi-natural grassland

In the UK, it is understood that some areas of semi-natural grassland can 'fall through the cracks'. Those areas of grassland that are not designated under SSSI legislation or protected through Natura 2000 or the Habitats Directive can be easily converted or intensified, often without triggering the EIA legislation in the UK. This can result in the loss of important habitats and biodiversity, as well as other key ES. At a farm and local landscape level, because of the lack of protection, there is also the threat of abandonment of semi-natural pastures (especially the least accessible) in order to concentrate stock on more productive land, with increased intensification on this land, for example in Ireland (Kramm et al.2010; Beaufoy et al., 2016). Equally, some pastures of exceptional environmental value are excluded from Pillar 1 direct payments, thus increasing the threat of abandonment of these pastures (Beaufoy et al., 2016). Equally, farmers may clear semi-natural habitats in order to ensure eligibility.

4.2.5.2.3 Under-management

Under-management is a challenge largely due to current agricultural economics and policies, exacerbated by stock regulations and restrictions (JNCC, 2016). Problems can occur when sites need a minimal level of grazing and/or hay-cropping, which is not achieved, because, for example, some farmers are reluctant to keep stock (large stock in particular) on pasture perceived to have little nutritional value. The resultant lack of management such as cutting, grazing or flooding will lead to colonisation by shrubs and trees or bracken encroachment, together with invasive species problems (JNCC, 2016).

4.2.5.2.4 Modification of agricultural practices

This includes draining, cultivation and fertilising as well as use of multiple cuts and intensive grazing, which has resulted in an overall loss of grassland biodiversity through loss of species number and abundance (JNCC, 2016). For example, management actions such as cutting grass early for silage rather than hay, re-seeding and fertilizing, drainage and stock feeding, and the application of herbicides, can cause issues such as reduction in seeding by flowering plants, destruction of the nests of birds, reducing sward species as well as habitat diversity, and increased build-up of nutrients (JNCC, 2016).

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4.2.5.2.5 Rewilding

Rewilding has become a popular concept as the focus of conservation practice has moved from the maintenance of specific species diversity towards the promotion of self-regulating and naturally functioning ecosystems, considered at larger scales (Biermann & Anderson, 2017; Corlett, 2016a). In the UK, no government policy refers explicitly to rewilding, but it is seen as having the potential to complement existing approaches to meet commitments on habitat restoration (POST, 2016). In Scotland, it is being considered as an option for some areas of upland in relation to regeneration of landscapes and in the UK there are some trials for rewilding in upland areas such as the Lake District. However, the subject is controversial and, if rewilding schemes are not implemented collaboratively with farmers and landowners (Pakeman et al., 2019), and the differentiation between abandonment and rewilding is not clear, then it could have complex implications for land management decisions about marginal areas of PG.

4.2.5.2.6 Fragmentation

In some places fragmentation of grassland areas is extreme, and means that certain habitats occur only in very small, isolated patches. It may prove to be a threat to the sustainability of many species populations, as well as causing management problems. This may affect the viability of the land and affect the ability of habitats to respond to climatic change because there is less potential for a species to colonise (migrate) from distant sites (JNCC, 2016).

4.2.5.2.7 Air Pollution

Atmospheric nitrogen deposition is a particular concern as it is considered a key threat for most semi-natural grassland types. Where there may be increased air pollution from growing urban developments and a lack of coordination of agricultural and environmental legislation, there may be threats to PG (JNCC, 2016).

4.2.5.2.8 Climate change and tree planting

With the production of recent reports on climate change reduction, such as the Committee on Climate Change's (CCC) report "Net Zero: The UK's contribution to stopping global warming" (CCC, 2019), there

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has been an increased push for tree planting as part of the mitigation actions. Grassland is often identified for potential land use change. For example, under their most ambitious scenario the CCC highlight that in England a 40% fall in grassland area in Wales a reduction of 35% by 2050 and Northern Ireland 11% will allow increases in land used for forestry, restored peatland, and agro-forestry. These predictions mean that there are likely to be changes to PG over the next 30 years.

4.2.5.2.9 Development pressure

In some places fragmentation of grassland areas is extreme, and means that certain habitats occur only in very small, isolated patches. This has implications for PG areas close to settlements and where demand for new infrastructure is high. Problems with regulations and planning policies that are designed to safeguard environments, also add complexity.

4.2.5.2.10 Brexit and policy uncertainty

The heightened uncertainty around post-Brexit agricultural policy is acting as a threat to the sustainable management of PG. This is because despite guiding principles laid out in government documents, such as England's 25 year plan, and the finalisation of the new Agriculture Bill, laying out the plans for economic support and environmental goals post-CAP in the UK, there are no clear mechanisms of delivery and very little support infrastructure to assist transition. At the time of writing the timescales of the Brexit process are fluid and uncertainty around the policy transition means that farmers are confused about how and when to apply for AES and support, this means that many areas of farmland could miss out on being part of AES, which threatens the regulated management of the land and leads to potential risks.

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4.2.5.2.11 Poor data

Due to a lack of resources, there are few up to date, accessible datasets recording the status and extent of grassland in the UK. The result is fragmented and outdated data about grasslands. With improvements to data integration a better systems approach could be taken to management.

4.2.5.3 Brief description of the governance structure and policy context

Environmental governance in the UK is a devolved issue. This means that the governments in England, Wales, Scotland and Northern Ireland make their own decisions about priorities and strategies for delivery of goals around environment, agriculture, fisheries and energy. Each government has their own department, public bodies, committees and advisory groups responsible for such issues (e.g. Environment and Forestry Directorate in Scottish Government, supported through Scottish Natural Heritage public body; Welsh Government supported through Natural Resources Wales public body; Department for Agriculture, Environment and Rural Affairs (DEARA) in NI; and Department for Environment, Food and Rural Affairs (Defra) in England supported by the Environment Agency and Natural England public bodies). England does not have its own government and is represented by the UK government at Westminster.

In 2019, all UK nations were within the EU and adhered to standards and policies applied to EU nations. However, as part of devolution, Scottish and Welsh governments sought to create environmental policies that went beyond the EU's minimum requirements (Burns et al., 2018). Burns et al. (2018) reported that Scotland has more ambitious targets relating to climate and energy policy and reducing plastic waste. Scotland has also been more successful at implementing some EU Directives in terms of going beyond their requirements (Royles & McEwan, 2015). Wales has sought to create more ambitious environmental policies than the UK in relation to climate change and waste (e.g. Cowell et al., 2017). The Welsh government has also attempted to innovate in relation to environmental legislation and passed the Wellbeing of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016. However, the Welsh government has struggled to meet some of the targets established by EU legislation (ClientEarth, 2018).

In England, the launch of the 25 years Environment Plan (Defra, 2018) brought ambitious targets for air, water, wildlife, environmental hazards, natural resource use, enhancing beauty, heritage and

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engagement, mitigating and adapting to climate change, minimising waste, managing chemicals and biosecurity. The plan uses a set of guiding principles to assess the UK's progress in environmental management and will have regular progress reports (e.g. Defra, 2019). Since its launch, the vision has supported progress amongst UK government on the creation and production of an Agriculture Bill[28], and an Environment Bill[29] to lay out future plans for agricultural and environmental management policies in the future.

The Environment Bill and the Agriculture bill are part of a process of policy redesign happening in the UK as a result of the 2016 referendum to leave the European Union. In relation to agricultural policy, for more than four decades the relationship between the UK Government and the farming sector has been dominated by the EU's Common Agricultural Policy (CAP), which has determined the public subsidies paid to farmers (Bateman & Balmford, 2018). The commitment has been given to keeping these subsidies in place for the duration of the current parliament (Downing et al., 2018), which is expected to be until March 2022. However, beyond this, there will be major changes in the way that subsidies are paid to farmers. The proposed Agricultural Bill has laid out an intention to shift the emphasis away from the previous model of support for agricultural activities and towards the objective of targeting public money towards the provision of public goods (H.M Treasury, 2007,2013), in particular those environmental improvements that are the focus of the Government's recent 25 Year Environment Plan. However, there has been incredible political uncertainty surrounding Brexit, which has affected the planning and implementation of environmental management in the previous few years.

In 2019, the UK operated under the EU legislations transformed into UK law and in the context of this research task 4.1c we approached the stakeholders with a view to understanding the functioning and effectiveness of UK policy within the EU context. Such policies were embedded in UK environmental management and were adapted, learned, implemented and evaluated in depth. In 2019, the year in which this research was carried out, perceptions and opinions of stakeholders were forming around new practices and policies that were being discussed and trialled. This evaluation of the state of UK agricultural and environmental policy within the EU in 2019 offers a helpful addition to the international analysis.

[28] https://www.gov.uk/government/news/landmark-agriculture-bill-to-deliver-a-green-brexit
[29] https://www.gov.uk/government/news/new-environment-protections-set-out-in-flagship-bill--2

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4.2.5.4 Identifying policies relevant to PG

4.2.5.4.1 Data collection

Key to validating and understanding the most relevant policies at the UK scale was the creation of an expert panel (or Blue Ribbon Panel) of stakeholders. Five experts were identified:

- Farmers interest (n=1) (England representative)
- Government interest (n=1) (England representative)
- Environmental interest (n=1) (UK-wide)
- Public/ environmental interest (n=1) (England representative)
- Specialist grassland interest (n=1) (UK-wide)

These experts were consulted by email and phone during February 2019. The phone conversations lasted between 20-30 minutes and were informal open conversations in which the purpose of the consultation was explained and advice sought in a conversational way.

As stated in section 1.3, although the case study covers the UK in general our resources have not allowed a full and fair inclusion of the contexts or stakeholders of the devolved nations. Therefore, although practitioners and stakeholders working in Wales, Scotland and NI responded to the Delphi and were interviewed as part of the project, there is a distinct English bias to the data collection. In particular, there is an English bias to the expert panel representation. This was due to the resource and time available to contact the panel and therefore a lack of ability to contact the counterparts of each representative group in each nation. Despite this, we have attempted to identify policies that exist and are applied across the devolved nations. However, each of the nations may apply the policy in a slightly different way and have different methods of supporting, designing, monitoring and reporting the policy. In addition, there may be more directly relevant policies in devolved nations that we have not picked up from this study. However, as the current activity represents a short initial scoping study, the differences across the nations will be picked up and identified throughout the project.

4.2.5.4.2 Policy mapping

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Consultation with the expert panel allowed the research team to derive a better understanding of UK policies that are most relevant to PG management. The difficulty lay in separating the policies by scale, as most of the policies mentioned by the expert panel were associated in some way to EU legislative context, for example, the national iteration of the CAP through agri-environment schemes, and initiatives born out of the need to deliver EU directives, such as the Water Framework Directive. As the EU context would be covered with the five policies derived from the Delphi process, we did not include the direct implementation instruments of EU policies in this national scale mapping. As such only three key areas of UK policy could be identified for analysis in this task, and even some of these policies have their origin in the national interpretation of EU legislation. However, we identified that they were important and distinct enough at the UK level to be differentiated from the EU legislation identified through the Delphi task. These included:

- **Environmental Impact Assessment (EIA) regulations**[30]: These regulations are derived from the UK Town and Country Planning Act (1990). They are applied to developments under a number of regimes including planning, energy, marine licensing, transport, agriculture, land drainage, forestry, flood management, ports and harbours and controlled activities, the most important of which for PG management is agriculture. The regulations often affect which areas of PG can be ploughed or converted. These regulations apply the amended EU directive "on the assessment of the effects of certain public and private projects on the environment" (usually referred to as the 'Environmental Impact Assessment Directive') to the planning system in England (UK Gov). The EIA regulations are also applied in Scotland, Wales and NI in very similar ways but under separate legislations. The aim is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project that is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process. The regulations set out a procedure for identifying those projects, which should be subject to an Environmental Impact Assessment, and for assessing, consulting, and coming to a decision on those projects that are likely to have significant environmental effects. The aim of Environmental Impact Assessment is also to ensure that the public are given early and effective opportunities to participate in the decision-making procedures.

[30] https://www.gov.uk/guidance/environmental-impact-assessment

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- **Sites of Special of Scientific Interest (SSSI):** Sites of Special Scientific Interest give legal protection to the best sites for wildlife and geology. They are designated by the relevant statutory agencies, which vary for England, Scotland, Wales and NI. In relation to legislation, in England and Wales the designation of SSSIs falls under the Wildlife and Countryside Act (1981), in Scotland under the Nature Conservation (Scotland) Act 2004, and NI, the Environment (Northern Ireland) Order 2002. In SSSIs, certain activities are prohibited and there are legal duties concerning how the areas should be managed and protected. Many PG areas contain SSSIs or are located near SSSIs and their statutory status affects PG management.

- **National Renewable Energy Action Plan**[31]: The plan provided details on a set of measures designed to help the UK meet its 2020 carbon reduction target. It aims to help secure energy supplies through 2020 and beyond and provide a sound framework for business to develop in the new industries, providing jobs and cutting harmful greenhouse gases. The plan is underpinned by the UK Climate Change Act (2008) and is part of the UK implementation of the Renewable Energy Directive 2009/28/EC. The important link to PG is indirect, through the emphasis on biofuels and energy crops, which could result in a rreduction in PG area.

Table 24 shows the resultant list of eight policy areas and examples of 15 policy instruments that (may) affect PG management. Each of these policies were analysed using the PAT (see section 3 – methods). It should be noted that the policies are all applied in the devolved nations but the policy instruments are often different. A number of the examples are instruments designed and implemented in England (e.g. Countryside/ Environmental Stewardship).

Of the 15 instruments identified, six are regulatory and involve a level of statutory compliance, and nine instruments involve financial incentives, often combined with information and guidance that are voluntary. The instruments implemented under the CAP policies (particularly Pillar I) are voluntary but have regulatory elements when a farmer becomes part of the CAP scheme.

4.2.5.4.3 Summary of PAT for UK: Evaluations of policies

31 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47871/25-nat-ren-energy-action-plan.pdf

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The most interesting information in the PAT for assessing effectiveness of policies came from evaluations. In the PAT, evaluations were used to record information on outcomes of the policy, continued change, the policy process, unintended effects and social value.

Although there were plenty of sources from which to populate the PAT, finding the most relevant and up to date information was often difficult. This is because the policies were not all reviewed on the same timescale and spatial scales, and often the evaluation processes would be different, and conducted by different institutions (commissioned by the government). Equally, there may have been multiple evaluations of difference aspects of a policy. Therefore, the PAT only gives a very small impression of some of the comments made about the policies and cannot be seen as representative of an overarching sentiment of government about the policies. They are therefore used as an indication of possible impacts and issues that can be further explored in the subsequent stages of the SUPER-*G* project, including in the stakeholder interviews.

Table 24 gives a summary of some of the comments made in government's (and other closely connected groups') evaluations in relation to the main policies. Table 25 also shows information about the cost/ financial value of the policies, which can help to understand the impact of the policies. This information was very difficult to source and often there was no official evidence of the financial costs involved in individual policy instruments. There were general statements about the costs of overall policies as well as reference to non-monetary costs that could also be relevant for assessing effectiveness. The variety of data makes it difficult to compare the financial or other costs of the policies, and it was beyond the scope of this study to conduct a cost/benefit analysis. This information was therefore used to understand the way in which policies are seen to impact. For example, some policies are justified or reported in relation to the amount of money spent to deliver the policy; others are reported and justified based on the financial saving they can make by being implemented, as well as the avoidance of significant environmental impacts.

Based on the evaluation information, it is difficult to give an overall impression of the policy mix in the UK from the PAT. However, there may be strength in the implementation of policies such as the Habitats Directive in which progress can be seen in improving biodiversity and creation of designated sites. Problems occur in the design and implementation of the Basic Payment and Greening measures of the CAP Pillar I. This is in line with general critique for CAP policies across Europe. EIA policy in the UK appears to be welcomed but individual applications of the regulations appear to be less effective.

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These observations are highly generalised using the information in the PAT, as there were restricted sources from which to draw conclusions. It is important therefore to supplement the PAT with interviews with a variety of stakeholders, who interact with the policies and instruments on a practical basis and can comment on their validity and impact.

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Table 24. UK PAT Summary (description of instruments)

	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
CAP Pillar I **(Regulated at European level and implemented at national level)**	(i) Viable food production; (ii) Sustainable management of natural resources and climate measures; (iii) Balanced territorial development	Basic Payments	The Basic Payment Scheme acts as a safety net for farmers and crofters by supplementing their main business income. Support under the Basic Payment Scheme is available to farmers who are allocated payment entitlements. You can apply for entitlements based on the land you farm and the activity you undertake. The scheme also delivers environmental and other benefits by requiring you to meet certain practices and farm in a sustainable way. [https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/basic-payment-scheme/] In England, the Rural Payments Agency (RPA) administers the BPS, which is an executive agency of the Department for Environment, Food and Rural Affairs (Defra).	Incentive instrument (voluntary) but with an important regulatory component (mandatory)
		Greening - Maintenance of PG	If the percentage of PG– compared to the area of agricultural land – falls by more than 5%, farmers who have ploughed PG may have to re-instate it. It would also mean that there would be restrictions on any further ploughing of PG. If the percentage does fall, the RPA will let farmers know if they need to do anything differently. If a farmer has areas of PG that are covered by the Wild Birds and/or Habitats Directives (Natura 2000), this cannot be ploughed up. (DEFRA, 2014 - CAP scheme in England - update [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/345073/cap-reform-august-2014-update.pdf])	Incentive instrument (voluntary) but with an important regulatory component (mandatory)

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
CAP Pillar II - Rural Development Programme **(Regulated at European level and implemented at regional level)**	Rural Development is the 2nd Pillar of the Common Agricultural Policy. The new RD Regulation for the 2014-2020 period addresses six economic, environmental and social priorities, and programmes contain clear targets setting out what is to be achieved. (EU Commission, 2015 https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/country-files/uk/factsheet-england_en.pdf) In addressing these challenges, the RDP will fund actions under all six Rural Development Priorities – with a particular emphasis on Priority 4 (agriculture and forestry ecosystems). 1. Knowledge Transfer and Innovation 2. Competitiveness of agri sector and sustainable forestry 3. Food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture	Productivity focus - The Countryside Productivity Scheme (England)	The RDPE Countryside Productivity Scheme provides funding for projects in England, which improve productivity in the farming and forestry sectors and help create jobs and growth in the rural economy. Under the RDPE Countryside Productivity Scheme, there are grants for water resource management and reservoirs, improving forestry productivity, adding value to Agri-food, improving farm productivity. Grants can cover up to 40% of the eligible costs of a project. If the minimum grant were £35,000, the minimum total eligible cost of a project would therefore be £87,500. (UK Gov guidance - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/698847/Improving_Forestry_Productivity_handbook_v1.2_archived.pdf)	Incentive instrument (voluntary economic subsidy)
		Environmental focus - Environmental Stewardship/ Countryside Stewardship (England)	Environmental Stewardship/ Countryside Stewardship- Environmental Stewardship is a land management scheme that provides funding to farmers and other land managers in England to deliver effective environmental management. Countryside Stewardship replaced environmental Stewardship in 2016 - some people still hold Environmental Stewardship agreements. Countryside Stewardship offers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. (Defra, 2019 - https://assets.publishing.service.gov.uk/government/uploads/system/u	Incentive instrument (voluntary economic subsidy)

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
	4. Restoring, preserving and enhancing ecosystems related to agriculture and forestry 5. Resource efficiency and climate 6. Social inclusion and local development in rural areas (EU Commission, 2015 https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/country-files/uk/factsheet-england_en.pdf)		ploads/attachment_data/file/779179/COUNTRYSIDE_STEWARDSHIP_OVERVIEW_2019_1.0_Online.pdf) The Countryside Stewardship schemes include Mid-Tier, Higher Tier and Wildlife Offers: - Mid-Tier – Farmers and land managers can choose from all available multi-year options and capital items to form an agreement that delivers local environmental benefits. - Higher Tier – Applicants managing more complex land in environmentally significant sites, commons or woodlands, which requires support from Natural England or the Forestry Commission. - Wildlife Offers – Designed to help guide farmers to the most straightforward options for their farm type, making it easier and simpler to secure a CS agreement. Offers are split into different packages for farm types: arable, lowland grazing, upland, and mixed farming. Hedgerows and Boundaries – Provides grants for farmers to restore existing farm boundaries and hedgerows on their land.	

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
		Areas of Natural Constraint (ANC) or Less Favoured Area (LFAs) (Scotland)	"Payments to farmers in mountain areas and other areas facing natural or other specific constraints shall be granted annually per hectare of agricultural area in order to compensate farmers for all or part of the additional costs and income foregone related to the constraints for agricultural production in the area concerned." (Rural Development Regulation) – Designations only in Scotland (e.g. England have decided not to designate but use Basic Payments to compensate upland farmers and moorland farmers)	Incentive instrument (voluntary economic subsidy)
		Rural focus – LEADER funding	LEADER funding - You can apply to your Local Action Group (LAG) for funding for projects that create jobs, help your business to grow, and benefit the rural economy, under the LEADER scheme. LEADER funding is delivered via LEADER LAGs and is available to local businesses, communities, farmers, foresters and land managers. A total of £138 million is available in the England between 2015 and 2020 under the scheme. LEADER is part of the RDPE. It is a French acronym (Liaison Entre Actions de Développement de l'Économie Rurale) which roughly translates as 'Liaison among Actors in Rural Economic Development'. (Eng Gov - https://www.gov.uk/guidance/rural-development-programme-for-england-leader-funding)	Incentive instrument (voluntary economic subsidy)
		Rural focus - RDP Growth Programme	The RDPE Growth Programme provides funding for projects in England that create jobs and growth in the rural economy. Under the RDPE Growth Programme, there are grants for:	Incentive instrument (voluntary economic subsidy)

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
			• business development • food processing • rural tourism infrastructure (Growth Programme Handbook - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/711698/Business_Development_Handbook_v2_CLOSED.pdf)	
Nitrate Directive **(Regulated at European level and implemented at national/regional level)**	The Nitrates Directive (91 / 676 /EEC) aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.	Nitrate Vulnerable Zones	Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution. They include about 55% of land in England. (UK Gov - NVZs - https://www.gov.uk/government/collections/nitrate-vulnerable-zones)	Regulatory instrument, with informational guidance
		Farming Rules for Water	The New Farming Rules for Water are new Rules for farmers and land managers to prevent water pollution were introduced in April 2018. The rules were designed to complement existing regulations and help implementation of the Water Framework Directive (WFD).226 Their main aim is to: keep soil on the land; match nutrients to crop and soil needs, and keep livestock fertilisers and manures out of the water. Land managers will have to ensure that steps are taken to protect water sources from diffuse agricultural pollution, such as fencing off water bodies. Farmers who are meeting their cross-compliance requirements will already be meeting their new legal obligations, but the legislative underpinning in the rules mean that civil penalties can be used as an added deterrent and criminal prosecution can be levied against the most	Regulatory (linked to cross-compliance), with some informational guidance, and scope for voluntary actions

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
			serious offenders.227 (UK Parliament 2018 - UK Progress on Reducing Nitrate Pollution – Environmental Audit Select Committee https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/65607.htm)	
		Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions	In July 2018, Defra published the Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions in collaboration with the farming industry, and in September 2018 it announced a £3mn scheme to implement it.221 (UK Parliament 2018 - UK Progress on Reducing Nitrate Pollution – Environmental Audit Select Committee https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/65607.htm)	Regulatory instrument (some statutory requirements) with some informational guidance, and scope for voluntary actions.
Habitats Directive **(Regulated at European level and implemented at national/regional level)**	The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I and II of the Habitats Directive respectively) to the European Commission. Once the Commission and EU Member States have	Habitats regulations	The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licenses by the appropriate authorities. (JNCC – 2017 - The Conservation of Habitats and Species Regulations 2017 http://jncc.defra.gov.uk/page-1379) They extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters). The Regulations enable the country agencies to enter into management agreements on land within or adjacent to a	Regulatory instrument (some statutory requirements) with some informational guidance, and scope for voluntary actions.

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
	agreed that the sites submitted are worthy of designation, they are identified as Sites of Community Importance (SCIs). The EU Member States must then designate these sites as Special Areas of Conservation (SACs) within six years. The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs) classified under Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive). These sites form a network termed Natura 2000. (JNCC - http://jncc.defra.gov.uk/page-1379) (Welsh Assembly - http://senedd.assembly.wales/documents/s68629/Paper%2013%20Explanatory%20Memorandum.pdf)		European site, in order to secure its conservation. (JNCC – 2017 - The Conservation of Habitats and Species Regulations 2017 http://jncc.defra.gov.uk/page-1379)	
EU Climate Change Adaption Strategy **(Regulated at European level**	The strategy is composed of the following three objectives, divided into 8 actions: 1) Promotion of actions of adaptation in the Member States: Promotion of national adaptation strategies in the Member States, Application of the LIFE financing	Climate adaption is served in the UK through the Climate Change Act 2008 and	The National Adaptation Programme (NAP) sets out how the Government will address the risks highlighted in the second Climate Change Risk Assessment (published 2017) over the following 5 years. The second NAP is structured around five thematic chapters, namely: the Natural Environment, Infrastructure, People and the Built Environment, Business and Industry, and Local Government. The NAP contains	Regulatory instrument with some Incentive instruments.

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
and implemented at national/regional level)	instrument for adaptation and Promote adaptation initiatives at the local level; 2) Expansion and dissemination of knowledge about adaptation for decision making: Collaboration and support for research and transfer of knowledge about adaptation and Development of the platform Climate-Adapt; 3) Promotion of adaptation of vulnerable sectors: Facilitate adaptation actions in the CAP, Cohesion Policies and Common Fisheries Policy, Ensure the establishment of infrastructure adapted to the climate change, and Promote financial products and insurance for investment in adaptation	National Adaptation Programme (NAP).	measurable actions on each theme. On implementation, the NAP defines policies and measures to be implemented at several levels and identifies the actors responsible for their implementation.	
Planning Policy – Environmental Impact Assessment (Regulated at the national level)	The aim of Environmental Impact Assessment (EIA) is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process. The regulations set out a	Environmental Impact Assessment Regulations (Agriculture)	The Regulations protect uncultivated land and semi-natural areas from being damaged by agricultural works, which increase the agricultural productivity of the land. (Natural England - Environmental Impact Assessment (Agriculture) (England) (No. 2) Regulations 2006 Public Guidance file:///H:/Downloads/EIA%2026%20November%202012%20(1).pdf)	Regulatory instrument

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	General Policy Objectives	Instruments	Objectives of Instruments	Type of instrument
	procedure for identifying those projects that should be subject to an Environmental Impact Assessment, and for assessing, consulting and coming to a decision on those projects that are likely to have significant environmental effects. The aim of EIA is also to ensure that the public are given early and effective opportunities to participate in the decision-making procedures. (UK Gov - https://www.gov.uk/guidance/environmental-impact-assessment)			
Sites of Special Scientific Interest (Regulated at the national level)	Sites of Special Scientific Interest give legal protection to the best sites for wildlife and geology. They are designated by the relevant statutory agencies, which vary for England, Scotland, Wales and NI.	SSSI designation and management	In SSSIs, certain activities are prohibited and there are legal duties concerning how the areas should be managed and protected. Many PG areas contain SSSIs or are located near SSSIs and their statutory status affects PG management.	Regulatory instrument

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Renewable Energy Directive: National Renewable Energy Action Plan (Regulated at the national level)	The 2009 Renewable Energy Directive sets a target for the UK to achieve 15% of its energy consumption from renewable sources by 2020. The UK renewables policy framework is made up of three key components: • Financial support for renewables; • Unblocking barriers to delivery; and • Developing emerging technologies https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47871/25-nat-ren-energy-action-plan.pdf	Energy Crops Scheme (ECS) (England)	The ECS aims to increase the amount of perennial energy crops grown in England in appropriate locations for use in heat and electricity generation. It offers grants to farmers in England for the establishment of energy crops such as miscanthus and short rotation coppice.	Incentive instrument (voluntary economic subsidy)

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Table 25. UK PAT Summary (cost and evaluation/ impact) (next page)

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POLICY	COST/ FINANCIAL VALUE	CLAIMED IMPACT/ EVALUATION
CAP Pillar I - Basic payments	The UK currently receives around 4 billion Euros in CAP funds each year. Around 80% is spent on Direct Payments to farmers under Pillar 1 (which also includes single Common Market Organisation (sCMO) interventions to support agricultural commodity prices). (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf])	Some argue that Direct Payments increase farmers' cash flow and stimulate capital investment in the agricultural sector, improving productivity growth (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf]) Direct Payments are not distributed evenly across farm businesses and not all sectors benefit from Direct Payments to the same extent. Since Direct Payments are based on land area, recipients of the largest amounts are typically farmers with large land holdings. Of the total payments under the CAP, most is received by a relatively small proportion of farmers. (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf]) It is also likely that Direct Payments inhibit the overall productivity performance of agriculture by undermining incentives and structural change in the sector. This unintended consequence could prevent long-term gains to farmers' incomes. Payments are likely to have hindered agricultural productivity growth in the UK by reducing the incentives to boost innovation and skills and enabling unproductive and inefficient farms to remain in business. (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf])
CAP Pillar I - Greening	The Greening payment makes up around 30% of the Direct Payments budget (Scottish Gov website - https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/basic-payment-scheme/basic-payment-scheme-full-Guidance/greening---bps/)	Some (five of 24) cross compliance requirements and the three greening requirements are outside the scope of existing domestic regulation. While their effectiveness is highly variable, it is likely that at least some aspects deliver environmental benefits. (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf]) A report into Greening from the European Court of Auditors concluded that the mechanism, 'as currently implemented, was unlikely to significantly enhance the CAP's environmental and climate performance' [61]. It estimated that Greening resulted in a change in farming practices of only around 5% of EU farmland. The fundamental weaknesses of the Greening measures were also exposed by a study funded by the European Commission[62].The limited scale of change in farming practices brought about by Greening was linked to a significant level of 'deadweight'. (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill

4.2.5.4.4 Policy logic

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		[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf]) Change in farming practices attributable to greening: PG (ESPG)≈ 1.5 % of EU farmland arable land (EFA) ≈ 2.4 % of EU farmland arable land (crop diversification) ≈ 1.8 % of EU farmland
Rural Development Programme (RDP) - CAP Pillar II	The UK currently receives around €4 billion in CAP funds each year. Around 80% is spent on Direct Payments to farmers under Pillar 1 (which also includes single Common Market Organisation (sCMO) interventions to support agricultural commodity prices). The remaining 20% is spent under Pillar 2 on programmes intended to support environmental outcomes, farming productivity, socio-economic outcomes and rural growth. (DEFRA, 2018 - Evidence and Analysis paper No. 7 - Agriculture Bill [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri	RELEVANCE: The RDPE represented a major source of funding to deliver land use change and management to deliver on priorities for biodiversity, soil and water quality and climate change, in support of wider policy, for example, Biodiversity 2020 and the Natural Environment White Paper. In contrast, the contribution of RDPE to the growth of the rural economy and employment was limited by the scale of actions and the fact that socioeconomic measures were not solely directed towards economic objectives [...]. The majority of RDPE measures were relevant to, and addressed the needs of, direct programme beneficiaries. Feedback from beneficiaries was consistently positive with project objectives seen as fully or mainly met. EFFECTIVENESS: In terms of the environmental objectives, progress has been made across all areas, biodiversity, high nature value farming, water quality and climate change mitigation, but this is not fully reflected in the CMEF impact indicators. This is due partly to external factors and the scale of environmental challenges, but also the difficulties in evidencing cause and effect in a national scale open system. In terms of rural businesses and communities, the three impact indicators related explicitly to the competitiveness objective: economic growth; employment creation; and labour productivity. While baseline indicators for all these metrics have risen over the programming period and there is good evidence of impact at beneficiary level, the absolute magnitude of the effects for Axis 1 (growth and employment, improving competitiveness of farming and forestry) and Axis 3 (rural communities, rural quality of life and growth and employment in the rural economy) is modest relative to the size of the rural economy and of the agricultural and forestry sectors. This largely reflects the comparatively low share of RDPE expenditure devoted to these objectives but also reflects the influence of external factors, such as the economic recession and wider Government funding for basic services (transport, broadband, etc.).

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	-bill-evidence-paper.pdf])	(University of Gloucestershire (2016) Ex-Post Evaluation of the Rural Development Programme for England (RDPE) 2007-2013 http://www.ccri.ac.uk/ex-post-evaluation-rdpe-2007-2013/)
Nitrates Directive	In July 2018, Defra published the Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions in collaboration with the farming industry (£3m) (UK Parliament 2018) The annual costs of fertiliser loss in UK lowland farming could be £10,000-£20,000 per km² (House of Commons Environmental Audit Committee UK Progress on Reducing Nitrate Pollution Eleventh Report of Session 2017–19 - https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/656.pdf)	Figures published by Defra in July 2017, show that while there has been an overall reduction in the nitrogen surplus since 2000, due to reductions in livestock and fertiliser use (as noted above), there was a slight increase (4%) between 2015 and 2016:236 (UK Parliament 2018 - UK Progress on Reducing Nitrate Pollution – Environmental Audit Select Committee https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/65607.htm) UK derogations from the Nitrates Directive meant that the total nitrogen (N) loading due to grazing livestock in on many instances farmers were applyingfarms was 250 kg N per hectare of nitrogen fertiliser rather than the 170 kg N/ha set out in the Directive.[238] (UK Parliament 2018 - UK Progress on Reducing Nitrate Pollution – Environmental Audit Select Committee https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/65607.htm) The new Rules for farmers and land managers to prevent water pollution were introduced in April 2018.[225] The rules were designed to complement existing regulations and help implement the Water Framework Directive (WFD).226 Their main aim is to: keep soil on the land; match nutrients to crop and soil needs, and keep livestock fertilisers and manures out of the water. (UK Parliament 2018 - UK Progress on Reducing Nitrate Pollution – Environmental Audit Select Committee https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/656/65607.htm)
Habitats Directive	Non-implementation of the Directives could lead to a gradual erosion of the benefits of the sites and species protected by the Directives, including a loss of ecosystem services that would accumulate in value over time. It has been estimated that even a 1% reduction of the ES flowing from the	SSSIs protect the majority of semi-natural habitats in England and Wales and have been effective in preventing further habitat loss. Coverage varies by habitat, and some agricultural and brownfield habitats are under-represented by the series. However, for other semi-natural habitats, a very small proportion of remaining area survives outside SSSIs, demonstrating the effectiveness of SSSIs in conserving them. (2. Defra (2011) Benefits of Sites of Special Scientific Interest - file:///H:/Downloads/finalreportsssis-benefits.pdf) Commission evaluation (2015) Considerable progress has been made in the implementation of the Directives' measures, particularly regarding the creation of the terrestrial component of the Natura 2000 network, the legal protection of Natura 2000 and the protection and sustainable use of species. The impacts of the measures taken so far are not yet sufficient to meet the overall aims of the Directives. In particular, while 52% of bird

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	Directives would cause losses of EUR 2- 3 billion a year, which would accumulate over time (1. Evaluation Study to support the Fitness Check of the Birds and Habitats Directives DRAFT - Emerging Findings For Fitness Check Conference of 20 November 2015 - http://ec.europa.eu/environment/nature/legislation/fitness_check/docs/consultation/Fitness%20Check%20final%20draft%20emerging%20findings%20report.pdf)	species have a secure population, 17% are threatened, with a further 15% near threatened, declining or depleted. Of EU Annex 1 habitats, 16% have a favourable conservation status, with most others being classified as having an unfavourable-inadequate status (47%) or unfavourable-bad status (30%). Of the species listed in Annex II of the Habitats Directive, 23% have a favourable conservation status, with most species having an unfavourable-inadequate status (42%) or unfavourable-bad status (18%). The administrative burdens of compliance with the Directives' site and species protection rules are significant. Effective implementation is dependent on the collection, analysis and sharing of information, interactions with stakeholders and consideration of plans and projects.
EU Climate Change Adaption Strategy	Almost £1.5 million was spent on CCRA2. Adaptation strategies adopted at subnational levels CCRA2 was carried out by the Adaptation Sub-Committee of the UK Committee on Climate Change, an independent expert body advising the UK Government on adaptation. This, along with lessons learned from the first CCRA1, brought considerable efficiencies and savings compared to CCRA1 delivering much greater value for money. (EU Commission () Adaptation preparedness scoreboard: Draft country fiche for	(Independent committee on Climate Change)The assessment of progress is not straightforward. It relies on a combination of interpretation of available datasets and expert judgement by the ASC. Even where it is clear that actions are directly addressing risks and delivering benefits, other pressures, such as demographic change, may still mean the vulnerability to climate change impacts is increasing. [...] The overall conclusion from the ASC's second assessment is that, despite some areas of progress, the level of risk has increased for a significant number of priorities (see Figure 1 above). The measures set out in the current NAP are not sufficient to avoid the impacts of climate change increasing. (Committee on Climate Change (2017) Progress in preparing for climate change 2017 Report to Parliament https://www.theccc.org.uk/wp-content/uploads/2017/06/2017-Report-to-Parliament-Progress-in-preparing-for-climate-change.pdf) There are some key adaption priorities that have been assigned a red rating in the 2017 assessment (therefore should be focused on in the next plan - and some of which have been a focus). These include --terrestrial habitats --freshwater habitats --Farmed countryside --Soil health and carbon sequestration --Commercial fisheries and aquaculture -- Surface water flood alleviation

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	United Kingdom https://ec.europa.eu/clima/sites/clima/files/consultations/docs/0035/uk_en.pdf)	--Development and surface water flood risk --Property level flood resilience --Health impacts from heat and cold --Digital and ICT infrastructure (Committee on Climate Change (2017) Progress in preparing for climate change 2017 Report to Parliament https://www.theccc.org.uk/wp-content/uploads/2017/06/2017-Report-to-Parliament-Progress-in-preparing-for-climate-change.pdf)
Planning policy (EIA)	Some national authorities surveyed have also stressed that EIA can avoid future costs, such as the costs of significant environmental impacts and the costs of legal procedures (including administrative costs) to repair environmental damages. (Explanatory Memorandum to The Environmental Impact Assessment (Agriculture) (Wales) Regulations 2017 http://www.assembly.wales/laid%20documents/sub-ld11028-em/sub-ld11028-em-e.pdf)	IEMA has found that --whilst practitioners appear to consider the regulatory approach to screening to be appropriate its case by case application is considered to be less effective. --finding also indicates that over 40% of practitioners believe case by case screening decisions have required EIA be undertaken for a proposal, which in their view, was unlikely to generate significant environmental effects. --the majority of practitioners (55%) believed that EIA had not been required for projects with, what they considered to be, likely significant environmental effects. (IEMA (2012) SPECIAL REPORT – THE STATE OF ENVIRONMENTAL IMPACT ASSESSMENT PRACTICE IN THE UK https://www.iema.net/assets/uploads/Special%20Reports/iema20special20report20web.pdf) Wildlife and Countryside Link have found that: --the thresholds for uncultivated grassland conversion are too high and the opportunity should be taken to remove them to halt wildlife destruction and to achieve the purpose of the Directives. --The Agriculture EIA regulations are undermined by the lack of a comprehensive inventory of the quality and extent of semi-natural grassland sites in England. Uncatalogued losses have been recognised by Natural England in a recent report. -- Our member organisations are aware of several cases where it would appear that Natural England is not enforcing the EIA regulations. -- We do not support the proposed new definition of uncultivated land, as it is unclear. It would introduce significant new uncertainty. If so then there is a clear risk that relatively superficial or sparse soil surface breaking activities could remove the appropriate EIA protection from a grassland (Wildlife and Countryside Link response to the Environmental Impact Assessment – Joint Technical Consultation 31st January 2017 https://www.wcl.org.uk/docs/WCL%20response%20to%20joint%20EIA%20consultation%20-%20%20FINAL.pdf)

Each of the policies and their associated instruments has a logic through which they might appear to produce effects. We use the Cascade Framework as a reference to illustrate the policy

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This National Renewable Energy Action Plan		A recent JNCC report http://www.jncc.gov.uk/page-4209 notes that the current UK biofuels land use footprint falls primarily within temperate grassland biomes in both the northern and southern hemisphere. It also estimates that UK consumption of transport biofuels could increase six-fold by 2020 in order to meet the Directive's 10% target, which would create a potential global land use requirement of between 4-8 million hectares. This highlights that robust scientific methodologies, applicable globally, must be developed to establish the criteria and geographical ranges of highly biodiverse grasslands in order to ensure their protection. (JNCC - http://jncc.defra.gov.uk/pdf/0959_JNCCresponse.pdf) 2016 Parliament report -- The UK is legally bound to provide for 15% of its energy needs—including 30% of its electricity, 12% of its heat, and 10% of its transport fuel—from renewable sources by 2020. We expect the Government will surpass the electricity sub-target, but success in this sector may not compensate for underperformance in heat and transport. It is not yet halfway towards 12% in heat and the proportion of renewable energy used in transport actually fell last year. On its current course, the UK will fail to achieve its 2020 renewable energy targets. (UK Parliament, 2016 -- https://publications.parliament.uk/pa/cm201617/cmselect/cmenergy/173/17303.htm?utm_source=173&utm_medium=sumbullet&utm_campaign=modulereports)

logic of the 15 illustrative instruments in the UK, focusing on the mechanisms through which the policies affect actors such as farmers and land managers as well as consumers, who may then effect changes to landscape management, demand for services, or benefits and values.

Figure 46 shows the connection between agricultural policies, farmers and landscape management leading to change in landscape structure. Policies include CAP Pillar I and II (as the core agricultural policy), including instruments - Basic Payments, Greening, Environmental Stewardship and Areas of Natural Constraints. These instruments directly target the farmer and their power to change the structure and composition of the landscape. Basic payments and LFA payments might indirectly affect the decision to maintain PG, and Greening and Countryside Stewardship give support for direct management actions.

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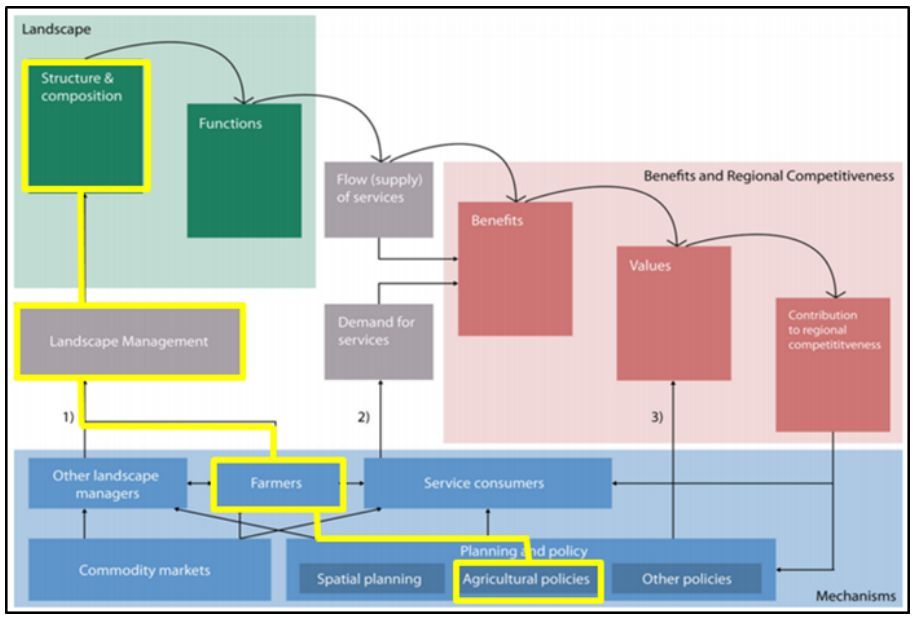
Figure 46. Policy logic of agricultural policies affecting farmers' landscape management in the UK.



Policy	Instrument	Type of instrument
CAP Pillar I	Basic payments	Incentive instrument (voluntary) but with an important regulatory component (mandatory)
	Greening	Incentive instrument (voluntary) but with an important regulatory component (mandatory)
CAP Pillar II (Environmental focus)	Environmental Stewardship/ Countryside Stewardship (England)	Incentive instrument (voluntary economic subsidy)
	Areas of Natural Constraint (ANC) or Less Favoured Area (LFAs) (Scotland)	Incentive instrument(voluntary economic subsidy)

Figure 47 shows the policy logic of other policies affecting farmers as landscape managers. These policies include the Nitrate Directive, farming rules for water and Code of Good Agricultural Practice (COGAP), and the Renewable Energy Directive, Energy Crops Scheme (ECS). These schemes are not directly or exclusively agricultural policies (as the CAP), but affect agricultural decision-making and can be classed as relevant to agricultural policy mix. They directly affect farmers as landscape managers as they support and require certain management practices to be in place (e.g. farming rules for water) or they affect the decision of farmers to convert PG to arable for energy crops (ECS).

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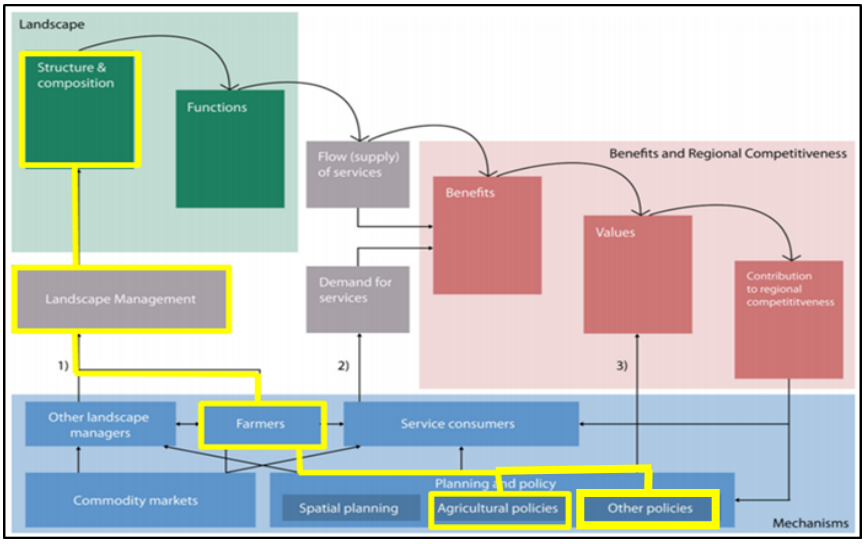
Figure 47. Policy logic of other policies (agricultural influence) affecting farmers as landscape managers in the UK.



Policy	Instrument	Type of instrument
Nitrate Directive	Farming Rules for Water	Regulatory (linked to cross-compliance), with some informational guidance, and scope for voluntary actions
	Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions	Regulatory instrument (some statutory requirements) with some informational guidance, and scope for voluntary actions.
Renewable Energy Directive: National Renewable Energy Action Plan	Energy Crops Scheme (ECS) (England)	Incentive instrument (voluntary economic subsidy)

Figure 48 shows the policy logic of agricultural policy (CAP Pillar II) affecting other landscape managers as well as farmers. This relates to the Countryside Productivity Scheme (England), which gives grants to multiple actors including farmers and those in the forestry sector. The scheme not only targets farmers and other land managers (e.g. through grants for water resource management and reservoirs), but also targets the demand for ES (provision of food), by offering grants for adding value to agri-food).

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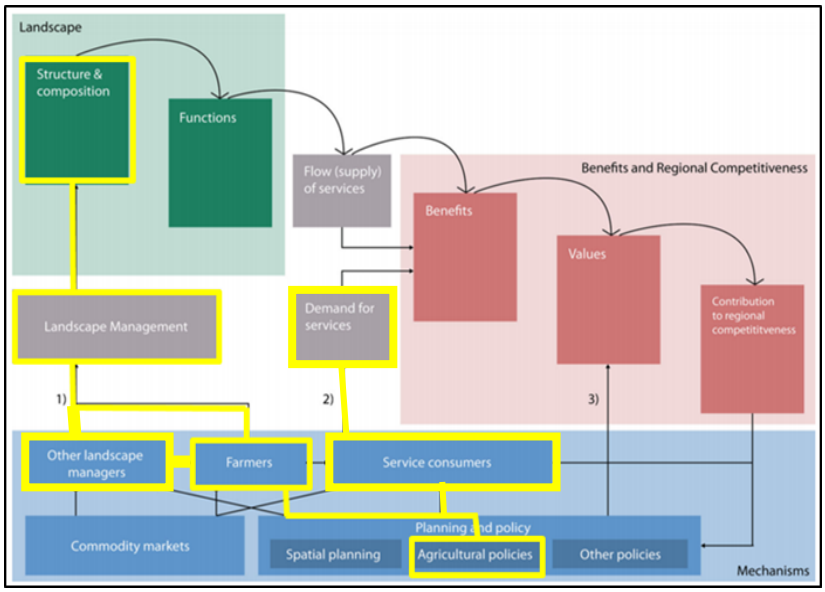
Figure 48. Policy logic of agricultural policies affecting farmers and other landscape managers.



Policy	Instrument	Type of instrument
CAP Pillar II (Productivity focus)	The Countryside Productivity Scheme (England)	Incentive instrument (voluntary economic subsidy)

Figure 49 shows the policy logic of policies that are not only restricted to agricultural policy (other policies that affect agricultural decision-making), that also have implications for spatial planning because they affect the status of spatial land parcels, which cause restrictions to the activities that can be carried out. The policies affect both farmers and other landscape managers.

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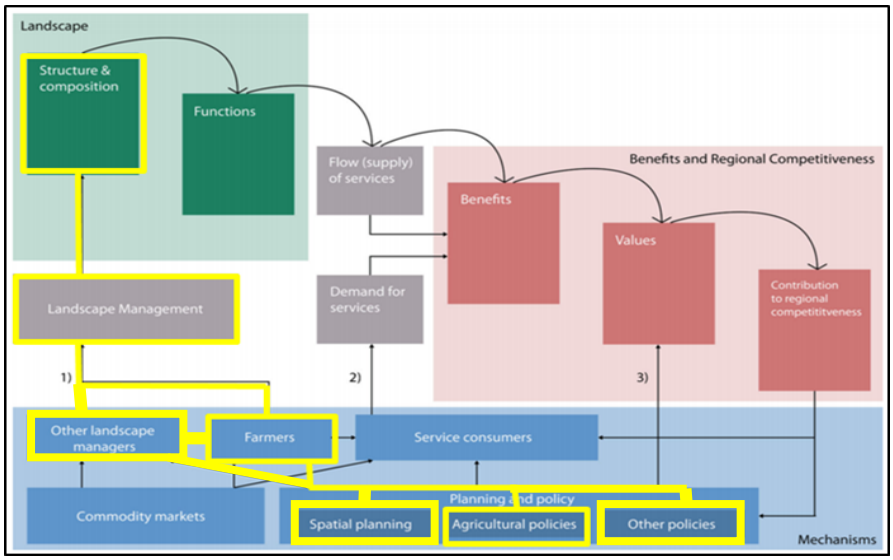
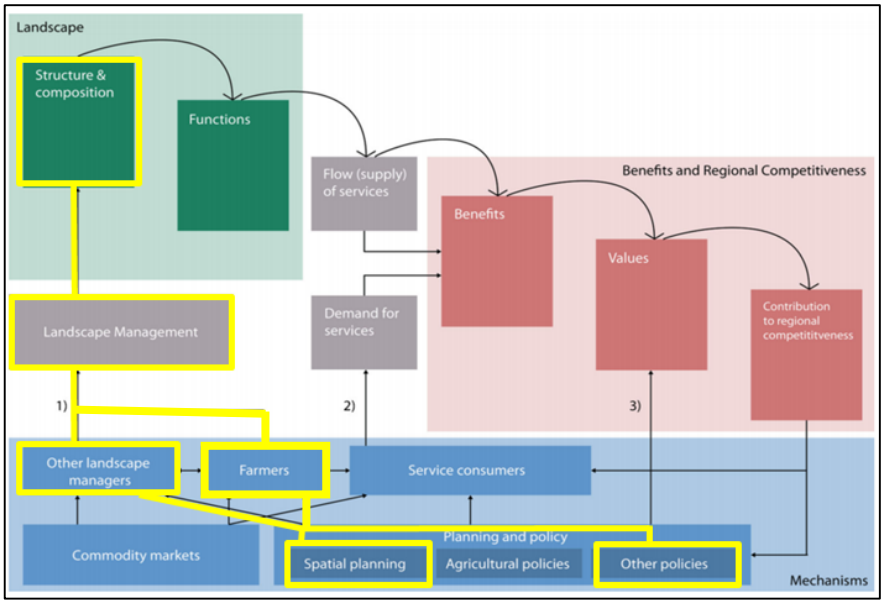
Figure 49. Policy logic of multiple policy types affecting farmers and other landscape managers.



Policy	Instrument	Type of instrument
EU Climate Change Adaption Strategy	Climate Change Act 2008 and National Adaptation Programme (NAP).	Regulatory instrument with some Incentive instruments.
Planning Policy – Environmental Impact Assessment (EIA)	Environmental Impact Assessment Regulations (Agriculture	Regulatory instrument
Nitrate Directive	Nitrate Vulnerable Zones	Regulatory instrument, with informational guidance

Figure 50 shows the policy logic of policies that are not focused on agriculture (they affect all landscapes), but that also affect spatial planning. For example, SSSI status affects the practices that can be done on that protected site.

Figure 50. Policy logic of other policies that affect spatial planning and apply to farmers and other landscape managers.



Policy	Instrument	Type of instrument
Sites of Special Scientific Interest (SSSIs)	SSSI designation and management	Regulatory instrument
Habitats Directive	Habitats regulations	Regulatory instrument (some statutory requirements) with some informational guidance, and scope for voluntary actions.

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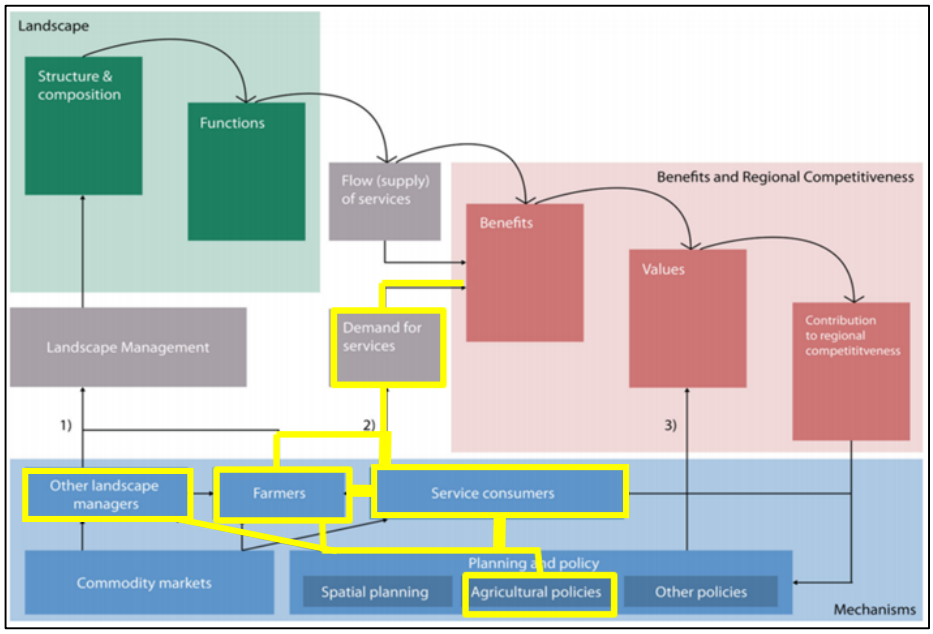
Figure 51 shows the policy logic for agricultural policy (CAP Pillar II) that focuses on the demand for ES. The RDP Growth Programme includes elements that focus on development of rural tourism as well as other rural businesses and food processing. This does not directly affect the landscape management but creates a demand for the landscape on which the tourism and businesses rely. Both programmes affect multiple actors including farmers, foresters, business owners, local businesses and communities.

Figure 51. Policy logic for agricultural policies that focus on the demand for ES.



Policy	Instrument	Type of instrument
CAP Pillar II (Productivity focus)	LEADER funding	Incentive instrument (voluntary economic subsidy)
	RDP Growth Programme	Incentive instrument (voluntary economic subsidy)

The policy logic in the UK is mostly focused on the direct link to landscape management through the farmers and other landscape managers (type 1 on cascade model). This is through the use of incentive instruments that offer payments for particular actions, practices at the landscape level that might lead to the supply of ES. Often the policies are practice based and emphasis particular actions to be fulfilled rather than results to be obtained. The incentive policies are voluntary, for example the CAP Basic Payment is a voluntary policy for farmers, however once they become involved in the scheme there are statutory requirements for farmers (such as cross compliance). Landscape management is also encouraged through regulatory instruments that restrict the practices ablthat can be undertaken on particular land parcels or at the farm scale

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in order to protect, maintain or enhance particular ES (such as habitats and species, or balance of nutrient (pollution) flows). Farmers and land managers do not have a choice whether to comply with the regulations, as a result some incentive schemes help farmers undertake actions to ensure that they comply. There is therefore crossover and interconnection between the policies, and their combined effects contribute to their effectiveness at a particular spatial scale.

The policy mix that has arisen as most relevant for PG management in the UK mainly focuses on targeting actions that will affect provisioning, regulating and supporting ES. A few policies (within CAP pillar II) target the demand for ES through focusing on tourism (cultural ES) and agri-food. These are the exception, however, and show that there are few policies driven directly by the demand for ES. It cannot be said, however, that other policies that target land managers are not driven by, or affect, demand for ES. For example, regulations set a precedent ES to be delivered and require the land managers to change their land management in order to fulfil that demand. Policies highlight (and therefore change) the demand for ES. The concept of demand for ES is therefore fluid as the key issues is who is creating the demand? In the cascade model, it is assumed that the demand is coming from service consumers, where the demand could arise from institutions through the policy cycle.

In the UK, the PAT and the policy logic diagrams show that there is a diversity of PG management relevant policy. Incentive and regulatory policies are the most prominent, and link to providing ES through targeting farmers and other landscape managers and supporting landscape management that effects structural landscape change. Evaluations show that despite some successes in terms of meeting biodiversity targets there are many issues and problems with some of the key policies affecting PG, including CAP policies and planning policies. These issues were investigated by talking to a sample of stakeholders involved in the implementation of the policies. This was done through 10 interviews with stakeholders from across the UK in order to contribute to the understanding of policy effectiveness.

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4.2.5.5 Stakeholder understanding of policy effectiveness

4.2.5.5.1 Data collection

The information gathered using the PAT was supplemented by interviews with policy stakeholders. The selection of the stakeholders was carried out using the same methods as used for the recruitment of the expert panel. There are, however, some significant gaps in the coverage of the mix of stakeholders as a result of difficulties in contacting and gaining input from certain groups. Notably missing is the direct government voice. The (English) Department of Environment, Food and Rural Affairs was approached, but their representatives claimed that they did not feel comfortable making comments on the effectiveness of EU and national level policies. This may have reflected the uncertain political times, as the interview were conducted at the time the UK was scheduled to leave the European Union and sharing any critique may have been seen as politically motivated. Other missing representation includes the Scottish and Northern Irish perspectives, which are missing due to time and resources available. Some interviewees were able to give some examples from NI, but none had experience or expertise from the Scottish context. Some other organisations who might have been judged to have an important stake in the management of grassland declined to take part due to lack of expertise or lack of availability in the time available. Although the interviews were never designed to be representative (but to give a small insight into some of the perspectives of those on the ground), these missing voices should be noted when making conclusions. Further efforts should be made in the remainder of the research to give a balanced view of the contexts of all of the devolved nations.

The interview period lasted between May and July 2019. Each interview lasted between 50mins and 1hr 20mins and all agreed to be recorded. Interviews were conducted via phone or Skype. Table 26 indicates the mix of stakeholders who participated in the interviews. These interviews were also supplemented by one informal conversation with three practitioners from a land management partnership group made up of statutory agencies, who have responsibility for management of a protected area in England.

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Table 26. Stakeholders who participated in interviews and their affiliations.

Type of stakeholder	Institutional affiliation	Information about institution
Public/ government interest	Natural England (x2)	Government's adviser for the natural environment in England. Natural England (NE) is an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs. NE promotes conservation, enhances landscape, promotes access to the countryside, manages the natural environment, provides regulation of licences, and secures improvement of facilities.
	Natural Resources Wales	Natural Resources Wales (NRW) is the largest Welsh Government Sponsored Body. It is principal adviser to Welsh Government, industry and the public. It enforces regulation and monitors breaches; it designates protected sites; and responds to environmental incidents.
Environmental interest (NGO)	Plantlife	Plantlife is a British conservation charity working nationally and internationally to save threatened wild flowers, plants and fungi. Plantlife own nearly 4,500 acres of nature reserve across England, Scotland and Wales and have 11,000 members and supporters.
	European Forum for Nature Conservation and Pastoralism (x2) – UK interest	EFNCP is the only European organisation focusing on the maintenance of low-intensity livestock farming. The network is positioned to provide a direct link between local projects involving low-intensity farming, and policy-making processes at national and EU levels.
Farmer interest	National Farmers Union	The National Farmers' Union is a member organisation/ representation body for farmers in England and Wales. Its purpose is to champion British agriculture and horticulture, to campaign for a stable and sustainable future for British farmers, and

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		to secure the best possible deal for members.
Specialist interest	British Grassland Society	The British Grassland Society is a forum for those with an active interest in the science and practice of grass and forage production and utilisation. The Society brings together research workers, farmers, advisers, teachers and technical members of the agricultural industry. BGS is in contact with farmers through its affiliated local grassland societies across the United Kingdom.
Research interest	Centre for Ecology and Hydrology	The Centre for Ecology & Hydrology (CEH) is a research organisation focusing on land and freshwater ecosystems and their interaction with the atmosphere.

4.2.5.6 Key messages

4.2.5.6.1 Relevance

In the UK, the policy mix was seen as working "to a certain extent" (NRW). SSSI policy was seen as relevant, and described as the strongest legislation that can be used, and assessed as 'tending to work' (Natural England). The NFU representative identified that the strongest policies (for grassland) in the UK are around semi-natural grassland and specific biodiversity. However, a representative of NRW stated that there was a lack of prioritisation of biodiversity-rich grassland and that coverage had not been sufficient in greener policies.

In the UK a variety of reasons for relevance or importance of policy were given. For SSSI policy, the reason for its importance was seen as long-term protection for grassland and the ability to conserve and maintain grassland (Natural England). Policy was also seen as having a role in correcting market imbalances, and that policies that had more of an objective and referred to the viability of the system were more relevant (Natural England). One interviewee believed that legislation should not be disruptive to normal farming practice and that farmers should be able

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to maintain their land (NFU). Another stated that tools associated with policy delivery should be accessible and usable by all, not just policy officials (environmental interest).

The EIA policy was seen as important but only when there was a positive dialogue with the landowner (Natural England). This is because it relies on land owner to follow the law. One representative of Plantlife mentioned that in reality, farmers might not apply for the permission, and the change (e.g. ploughing up) would go unknown. The problem was assessed as stemming from a decrease in the capacity of agencies to monitor, and therefore for issues to slip through the cracks. One interviewee claimed that there was a threshold below which the policy was no longer relevant.

A system of Payment by Results was stated by some interviewees to be a potentially more relevant policy approach than present because it give farmers more responsibility. Examples of the scheme have been trialled in the Burran, County Clare and Yorkshire. A Natural England representative assessed that payment by results schemes have the potential to be rolled out into a larger scheme. However, the interviewee talked about problems, including technical issues with the scheme, and the level of support needed for the farmers in order that they understand the process. There would also be caution needed around the targets set, and a chance to account for uncertainties. For example, it might be difficult to account for things happening outside the farm gate.

Agri-environment schemes (AES) in the form of payments were also seen as relevant policies, particularly as they underpin SSSIs. AES were seen as relevant (Natural England) as they help to conserve and maintain grassland. The LFA scheme in Scotland was seen as vital to farming (EFNCP), and CAP scheme was seen to have support for low input grassland (NFU). However, there were a number of aspects identified that made AES less relevant including a limited budget that tends to favour larger areas, and disadvantage small meadows. There was also seen to be a large admin burden on the landowner, particularly with the latest scheme, as well as issues with the support that agencies can provide. The prescriptiveness of the schemes were seen as an issue. The Welsh AES 'Glastir' was assessed as "*completely pointless*", by one interviewee. They had personal experience of the scheme, which in his opinion involved minimal activity. The

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interviewee identified that one of the key issues with the scheme was that it was "*not linking into the good things that we are doing already*". As such, it seemed very *ad hoc*. However, the interviewee identified that "i*f you are in a designated area it is a very different story*". This shows that policies targeting designated areas may be more relevant by providing appropriate support. These comments also highlight a comment made by a representative of CEH that there is a lot of difference between policies across the devolved nations of the UK.

In the UK, issues around irrelevance alluded to a lack of policy in relation to food was seen as important for grassland management. The outcomes of the policies are seen as problematic with some interviewees mentioning the presence of abandonment and afforestation at local levels. Difficulties with irrelevance may arise around ideas of language. Several interviewees mentioned issues around the definition of semi-natural and PG within policy (NFU, BGS…..), and therefore, that relevant policies should recognise that these terms mean different things to different people and often conflict in different legislation. For example, the NFU representative claimed that:

> "*The definition of semi-natural grassland is confused and that matters because it affects the expectations of the land. Sustainable permanent pasture will mean different things to different people. People can freely interpret what semi-natural grassland is in relation to legislation: One piece of land can be semi-natural in one context and not in another. When this happens a business is in limbo, they can't move forward, and accrue a lot of legal fees for appeals*." (NFU)

The definition of PG was also seen to be an issue:

> "*One could be a single species ley that gets reseeded; the other could be a varied species that hasn't been touched for 20 years. Very different ES from diverse grassland and perennial rye grass. This causes confusion when it comes to ploughing it up if it is a four-year ley. The definition of PG may not be helpful." (BGS)*

Another example of an irrelevant policy was given where the design had been inspired by one context (for example, maize monocultures in Germany) and applied across Europe where this

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particular context may not apply (NFU). Equally where the interviewee feels that the policy may have been designed out of context (e.g. by people with no experience of upland hill farming and hay meadows) meaning that that interest is omitted from AES.

Relevant policies were seen as those that would help tackle ongoing problems and contexts including Brexit and issues such as climate change and rewilding. Another issue for policy relevance was seen to be a lack of data about grasslands, including their extent and condition.

4.2.5.6.2 Legitimacy

The issue of Brexit was not dominant in the interviews, but many interviewees alluded to the uncertainty created by the situation, which links to the idea of legitimacy and lost legitimacy through mistrust. For example, one NE representative said that:

> "*Brexit is very complicating, and creates lots of uncertainties and mistrust. There are lots of options on the table for new policy and there are so many unknown effects and consequences*".

Legitimacy was sometimes seen to be tied to the fact that public money is spent on policies. For example one NE representative talked about the fact that schemes are time limited (10 years long) and after that time the farmer can walk away, make changes, and even go back on initiatives. Sometimes negative changes might not be caught by EIA regulations. This has implications for legitimacy because if taxpayers' money can only be guaranteed to have a certain effect for a limited amount of time, after which the results may be reversed, where is the certainty and trust that the money is being spent responsibly and sustainably. The interviewee cited that there could be incentives to have land in longer agreements to avoid this issue.

Legitimacy can also be understood through the eyes of farmers, some of whom who identify as good farmers. For example, one interviewee (EFNCP) mentioned that the farmers in the Burran area of Ireland are proud and feel that they are leading lights. They think the environment is a product and make the effort. Compared with other farmers they feel they have good motivation and mentality. These farmers believe that their actions and intentions are legitimate. The interviewee (EFNCP) identified that farmers are influenced by the image of a good farmer

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through shows, college and the farming press, and that they strive for the best price, the best tractor, and the most beautiful ryegrass field. These perceptions have implications for policy that may not be targeting such aspects, and therefore may not be seen as legitimate by the farmers. Equally, farmers wish to maintain their legitimacy and policy might be perceived to undermine that. For example, one interviewee stated that there can be resentment around taking basic payments because some people feel ashamed to be taking public money. They would much rather get money from production. Some farmers go to the extent that they are quite secretive and do not want their neighbours to know what they are getting. The interviewee stated that this is because subsidy is a difficult word with link to post-war feeding the nation. However, it could be more legitimate through links to paying for ES.

Tension between interest groups can signal issues of illegitimacy when there is little trust. For example, one interviewee (CEH) claimed that farmers feel that NGOs are against them and therefore there is not good evidence for what they are already doing for the environment. Therefore they feel that they would like increased monitoring of policy outcomes and changes to the land. However only a trusted group could carry out the monitoring legitimately. The interviewee claimed that farmers believe CEH can provide independent, trusted (legitimate) evidence. Links such as this between sectors are seen to increase legitimacy. For example, one interviewee (Plantlife) believe that there should be more interaction between the NGO sector and academia to increase knowledge exchange.

4.2.5.6.3 Democracy

At the level of individual organisations, there is a feeling that most have some form of power when it comes to influencing policy or having opportunities to comment and feedback. Within NE, there is seen to be a certain amount of independence away from chief executive and central government (NE) and they are seen to have a legitimate input into the development of land use policy. The government still has the ultimate decision about whether to take the advice (NE). NRW is the Welsh counterpart of NE and has a similar role. They are involved in the development of agri-environment schemes and can affect agricultural and environmental policy (NRW). The EFNCP representative felt they had some influence on policy through a seat on CAP committees.

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They also organise seminars for DG AGRI and DG ENV. They felt that they had some influence when working with other organizations to change the consideration of inclusion of trees and shrubs in the grassland definition. The NFU representative was involved in consultations on CAP, agri-environment and EIA. They had the chance to talk to Defra officials and to respond to consultations. They encourage members on the ground to engage, but when there is a high level of detail for something small, it is difficult. "*But it's not for lack of trying*".

BGS have responded to consultations in the past. However, the limited capacity of the small BGS team means that they miss the opportunity to respond to some consultations. The BGS interviewee stated that there could be more targeting of key organisations for some consultations. Equally, they are not aware that there is any information gathering on behalf of NE on what is required to renew definitions and policies. This perceived lack of a link between the NGO and government representatives could be significant in relation to the democratic nature of the policy mix in the UK.

A certain amount of success is assigned to endeavours that bring multiple groups together to affect changes. For example, one interviewee (CEH) claimed that in Wales they try and work collaboratively and are careful with the language that they use to bring the NFU and NGOs into the conversation. One interviewee (plantlife) gave an example of the 'Back from the Brink' project that brought NGOs and NE together through a partnership to target issues with specific species. Equally, the interviewee described having a stronger influence on policy through the networks, Wildlife and Countryside Link and Greener UK. Being part of such networks meant that they could provide recommendations endorsed by other NGOs, which put weight behind the recommendations.

Some organisations attempt to engage upwards, for example one NGO (Plantlife) tried to work from the officer level and engage at the more senior level with MPs and MSPs, to raise questions within debate. Other organisations have found some difficulties when engaging up to the European level. One interviewee claimed that "*DG AGRI are difficult to work with*" because "*they don't seem to understand the issue and don't seem to be open to the evidence*". This could reflect the difficulty that larger scale governance organisations have in engaging with smaller scale or

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local issues. Even within one organisation such as NRW there are issues. A representative from NRW reported that they would prefer that the feedback loop was better between higher levels and officer level. They claimed that there was a need to bring in experts to transfer knowledge between levels.

Particular issues were mentioned in relation to the EIA regulations for which the level of public consultation was thought to be minimal (NE). An interviewee from NFU said that they would like the consultation to "*be pragmatic, to have some meaning, so at least people understand what the rule requirements are, making it genuine rather than just trying to capture all grasslands, which is why that definition issue becomes a big one*".

4.2.5.6.4 Efficiency

There was a variety of understandings of the meaning of efficiency. Some interviewees were not able to comment on efficiency, as they did not have the knowledge or awareness of high-level costs. One interviewee stated that it was more important to focus on the bigger picture than to spend millions on individual projects (EFNCP). Another stated that efficiency is an outdated word, and we should be thinking about resilience, because efficiency can be misinterpreted. For example, the CEH representative felt that 'profit seeking' farmers were often the most efficient but it doesn't mean they are creating sustainable or resilient landscapes. Another interviewee understood efficiency in terms of the viability of the farm business and highlighted the importance of overheads (NFU). Another related to agri-environment scheme outputs, for example Glastir was seen to have some management options that "don't achieve much", e.g. the Glastir 'fertiliser' option (NRW). The BGS representative referred to the ability to maintain PG, and assessed policies as broadly efficient since the UK has managed to maintain the PG area. The same interviewee also acknowledged that efficiency could be seen in relation to the delivery of ES, but that that this would be more difficult to assess, i.e. to "tell *whether it (PG) had done its job*".

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Monitoring and evaluation were seen as important aspects of evaluating the efficiency of policies. The NE representative felt that in the UK, the monitoring of progress and change had been impacted by cuts to NE, which meant that they no longer have the same capacity to track progress as they used. This lack of capacity also leads to a lack of data about grasslands. For example, there is little to no information on the grassland resources outside of the SSSIs and agri-environment schemes. However, collating an inventory would be very costly. SNH (Scottish Natural Heritage) and NRW representatives also recognised that limited time and resources was an issue.

Despite the existence of monitoring and evaluation programmes, our ENCF interviewee claimed that no one was effectively assessing the way that measures are implemented or taken up. For example, SNH started AES monitoring in 2014, but the monitoring is not timed so it can feed into the next 7 year policy cycle (EFNCP).

Some interviewees talked about inefficiency in relation to administration and delivery (e.g. Plantlife). For example, within AES, farmers have not been paid, they get advice from lots of different agencies, which can be complex and frustrating, and neither efficient or effective (Plantlife). One interviewee advocates for an integrated approach, where there is a need for a single point of contact, who can get to know the business and the farm, so farmers do not receive mixed messages. A similarly integrated approach is advocated between sectors, for example including air quality advice in the Farming Rules for Water (Plantlife) and ensuring that Defra departments are coordinated.

4.2.5.6.5 Impact

Certain policies such as the CAP rules and the EIA, are seen as ones that have had a direct impact because "*they capture quite a lot of the directive stuff*" (NE). SSSIs are seen as strong policy because they "*can conserve sites*" (NE). However, they are not immune to

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issues. There can be damage through passiveness of sites because frequent site visits are not possible. It is seen as "*not perfect but it does ensure some survival*". The impact of SSSIs is also affected by the monitoring method, as it uses the lowest status within one unit in a 100 unit area, which doess not always give a true picture of what is happening on the ground (NFU). The BGS interviewee stated that impact can be evidenced by the fact that "*permanent pasture is being protected*". Such assessments show that impact can be seen as achieving goals and seeing change in environmental indicators. However, another interviewee stated that policies like CAP Pillar II perform monitoring by proxy, for example farmland birds, and the scales are variable and "*it is really hard to actually say whether we have had an impact*". This is especially true if the indicators are not aligned with the design of the policy in the first place (NFU). Equally it is dependent on how the policies are implemented, for example the CAP policies in England are seen as working, but there are problems with the administration of schemes and the quality of advice (Plantlife).

The Nitrates Directive is seen to have had an impact because it has affected important activities such as manure management and nutrient management (NE), even if this may only be on grassland and not on arable land (Plantlife). This implies that impact refers to changes in behaviour. However, a representative from CEH stated that evidence from farmer practice surveys indicated that farmers often do nothing differently when being paid through agri-environment schemes. Despite this, agri-environment schemes are seen to be effective via published studies of effectiveness. However, there are some issues, including a lack of follow up and farm visits to monitor progress and ongoing impact, as well as being time limited (NE). Impact perception is also affected by the degree of monitoring available. For example, the NRW representative felt that there was not enough monitoring for the Glastir scheme, with uncertainty around the impacts and effectiveness.

4.2.5.6.6 Unexpected consequences

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Some example of the unexpected consequences of policy include:

- Policies limiting livestock on the uplands has meant increased livestock pressure on the meadows, which has negative consequences (NE)
- Some agri-environment schemes in the upland focus on destocking, which results in no -stock on some upland areas because of the way that the payments are calculated (NFU) with negative consequences for biodiversity that depends on grazing
- Decoupling of payments from production seems to increase abandonment (EFNCP)
- Small fields can be ploughed out without triggering an EIA (EFNCP)
- If the land has some trees and shrubs and cannot be defined as grassland, then there is no support for the land and it becomes abandoned (EFNCP)
- Fences are a good way to divide and manage land but are actually perfect perches for predatory birds (CEH)
- Political reasons why people have not renewed AES agreements. The paperwork and timescale can be quite daunting and Brexit means they think it will not be happening now and do not put the effort in. This is a retrograde step (BGS).
- Farmers get fed up with the process and are dropping out of schemes as a consequence - even doing without single farm payments. This is a concern because we want the scheme to work for farmers. If the farmers are not receiving money then they are not required to do cross compliance, meaning no mechanisms and no monitoring (Plantlife).
- Woodland creation and the push for tree coverage reduced PG, but there are carbon sequestration opportunities on some species rich grassland (NRW).

One interviewee suggested that in order to avoid unexpected consequences, policy makers and other stakeholders need to look at the system as a whole (NE).

4.2.5.6.7 Desired changes

There were many ideas put forward relating to desired changes including those related to extra resources, support and monitoring; new topics and approaches that should be more closely considered; definitions and clarity needed; new policy elements to

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encompass at the design stage; and specific goals to achieve. Some aspects are immediate and relate to current issues and some are more visionary and look to the future values that might underpin agricultural and environmental policy.

A. Resources/ support/ monitoring

- More support for grassland – not just the specialist habitats. (NE) e.g. a wider system of protection for grassland species rich areas (Plantlife).
- Better monitoring e.g. good GIS maps of grassland across the UK. We don't have a complete picture of semi-natural grassland in the UK (EFNCP).
- Better data availability linked to clearer definition (BGS).
- More evidence of benefits of ES (NRW).

B. Topics and approaches to consider

- Recognising the multiple benefits from PG (NE) e.g. Welsh Government is looking to provide multiple benefits from grassland around GHG mitigation, soil conservation, water quality, biodiversity and cultural services (CEH).
- Link to the delivery of ES - ES payments to landowners, but that depends on resources (NE).
- Net gain is important in new policy (NFU).
- Link between forest policy and grasslands (NFU).
- Flexibility for farmers (NFU).
- Whole system.
    - Think about the whole farm economy – farmers do not want payments in one small part but linked to the rest of the farm to overcome problems of unprofitable other parts of the farm (EFNCP).
    - Need to think about the whole farming system (NFU).
- Integration.
    - One policy element really ties in well with another element (EFNCP).

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- Agri-environment schemes need to be more integrated - make a single picture for farmers (Plantlife).
- Stronger link to air quality legislation needed (Plantlife).

- Brexit.
  - Need to be thinking about the impact of Brexit and future trade deals because that will impact land use. The sheep meat industry might collapse if the tariffs are not right (NFU).
  - Use Brexit as a chance to do things differently (Plantlife).

C. Definitions and clarity

- Need to differentiate between low input and high input systems. At the moment policy doesn't recognize the difference (NE).
- Clearer definition and distinction between different types of grassland (BGS).
- Distinctions for where the EIA is required. The definition for when you need permission to plough is different from what is written on a Defra return (which is a simple statement that the land has been in grass for > 5 yrs). NE have a different definition (BGS).

D. New policy (elements)

- Stronger soil policy (NE) e.g. Like to see a 5 year rolling programme for soil condition. Farmers could assess soil condition regularly if encouraged. Need skills training and schemes like Farming Connect to encourage farmers (CEH).
- There is a need for soil-focused policy – this is not a new idea, but would bring together elements of dispirate policies that tackle soil related issues (BGS).
- Biofuels could be a positive policy if managed well (NE).
- Food policy – which should be considered as having an impact on grassland e.g. should we be self-sustaining or import all food? (NFU).

E. New mechanisms/ instruments

- Increase special incentive payments in CAP Pillar I for the management of semi-natural grassland (EFNCP).

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- Results based payments as these have been successful at small scale. It would need to be collaborative and developed in partnership with farmers (EFNCP).
- Need payments for public goods - at the moment it is targeted towards “jewels in the crown” - what about the non-designated areas (EFNCP).
- Grassland management plans (Plantlife).
- Decrease in single farm payments - money given to farmers does not always support rural communities - payments should be more directly targeted at societal benefits (NRW).

F. Specific goals

- Prevent attrition of grassland (NE).
- Achieve some of the targets (NE).
- Maintain, restore and create species-rich and semi-improved grassland (Plantlife).

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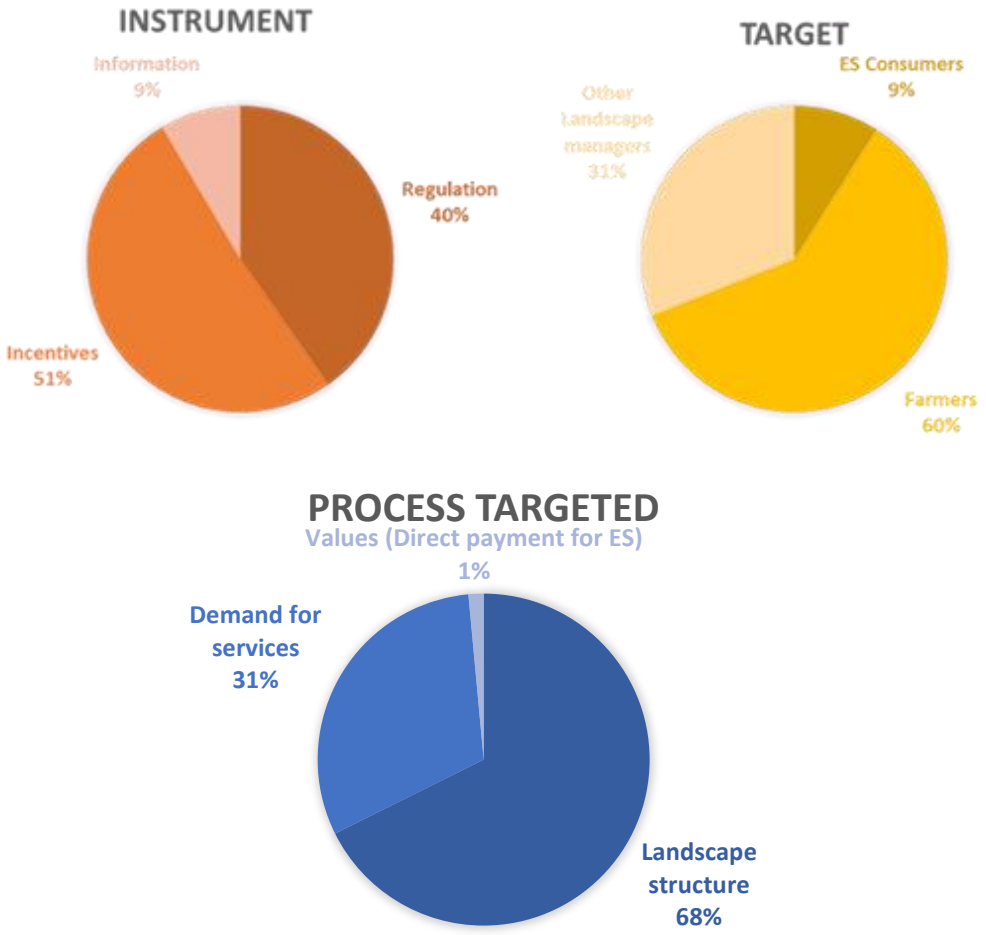
4.3 Policy logic and perceived effectiveness across case study countries and stakeholder type

Following on from the presentation of policy analysis within each of the case study countries, this chapter presents an analysis across the case study countries.

4.3.1 Policy across case study countries

A synthesis of policy logics across the five European countries reveals several consistent patterns (see Figure 52 below).

Figure 52. Prevalence of instruments, targets, and logic influencing grassland policy across five European countries**.**



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There is a clear policy preference across Europe for the use of incentives. Of the 82 policy instruments identified in our mapping, 51% were a form of incentive. Regulations were also commonly found, and of the total policy instruments identified, 40% were regulatory. The least common type of policy instrument was information. It was used as a form of influence only 9% of the time.

Another way to understand the logic is in terms of who is the target of policy instruments. Across Europe, we see that farmers (60%) and landscape managers (31%) are overwhelmingly targeted directly with policy instruments. Of the policy instruments we identified, only 9% were trying to target, or influence, demand from consumers of ES. Moreover, only a small number of the policies reviewed targeted direct payments for ES.

Through understanding the policy instruments used and the targets of policy across Europe, a picture of the policy logic emerges. The most common policy logic we identified was through directly influencing landscape management with incentives and regulations (68%). Landscape management in turn influences the structure and functions the landscape is capable of providing. Landscape management therefore indirectly influences the flow of ES.

The next most common policy logic we found across Europe (31%) was via increasing demand for specific ES. This logic indirectly influences how landscapes are managed by increasing the demand and therefore value of producing specific ES. As the value of a specific ecosystem service increases, it becomes more likely that landscape managers will adopt their practices in a way that the composition and structure allow functions conducive to producing the ES.

The final logic we found evidence for was through targeting the value of a specific ecosystem service through direct payments to farmers. This logic directly influences landscape managers' decision-making in the direction of the targeted ecosystem service. As covered in the previous paragraph, when the value of an ecosystem service rises, the land manager is expected to modify their landscape structure, composition and function in a way that allows the ecosystem service to be provided.

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4.3.2 Stakeholder evaluation of policy effectiveness across case study countries

4.3.2.1 Aggregation of stakeholder perspectives – overall perceptions of effectiveness

We aggregated stakeholder perceptions across the five European countries and groups as a starting point for discussion. This was done by assessing the overall 'mood' of each interview theme (e.g. relevance, democracy, legitimacy, efficiency and impact) with each interviewee, based on the balance of positive, negative or nuanced opinions they expressed. A summated index was created for each interviewee by quantifying the way they expressed their opinion, into the values 1, 2, and 3, representing negative, nuanced, or positive opinions respectively. These values have then been aggregated within the categories of relevance, democracy, legitimacy, efficiency and impact for each type of stakeholder across countries and for each country ascross all types if stakehodlers (Figure 53 and 54).

These assessments were made by the interviewers who experienced the conversations first-hand, therefore assessments are subjective judgements of the opinions of the stakeholders, however, they aim to be a mode by which the qualitative expressions within the 50 interviews can be represented (through fuzzy categorisation) as quantitaive scores. The comparisons through such numbers are highly speculative, but may give a starting point for the discussion of difference across geographies. The intention is not to (statistically) generalize our results. Instead it is to describe potential patterns found within and across stakeholder groups and countries. Similar to Mook (1983), we argue that the value in quantifying the stakeholder interviews across countries and groups is related to theoretical generalizability. The values we provide may hold true and have meaning in the specific conditions they were explored, and findings in one condition or context may theoretically generalize to others.

From the Figure 53, we can see that there are differences in the way that stakeholders have been assessed to be expressing their opinions about each theme. On average. stakeholders in Sweden have been assessed as expressing slightly more positively nuanced views than the other countries, and the UK has been assessed as expressing comparatively more negatively nuanced

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views. Theoretically, this result may be explained by a relatively higher trust in Sweden in government institutions than other European countries (Viklund, 2003). Figure 53 shows that Swedish stakeholders have been assessed to make the most positive expressions when talking about relevance and democracy of policies, but comparatively nuanced or negatively nuance opinions for the other catagories, showing that trust may only be manifesting as positivity for some aspect. The figure also shows that the Czech Republic, for example, have been assessed to have a higher level than Sweden of positivite statements made about legitimacy, perhaps also reflecting a particular power dynamic between the government and people with a vested interest in PG management in Czech Republic. Czech Republic also has an assessment of fewer positive statements about efficiency than the other countries, which may reflect some of the complications with the administration of policies in the country, similarly to the UK, where efficiency has also been assessed as relating to more negative statements, and where many stakeholders mentioned the negative aspects of some policy delivery processes.

Figure 54 shows that there are differences between stakeholder groups in the way they have been assessed to express opinion. Unsurprisingly, the most negative stakeholder group across Europe concerning policy effectiveness were the special interest groups (those representing environmental, regional or specialist product interest). We believe this is primarily due to their roles as representatives of environmental, climate and biodiversity groups—areas where grassland management has tended to prioritize provisioning services over regulating and cultural services. Surprisingly, European academics were the most positive and farmers were the second most negative (with the exception of Swiss farmer interest group, who expressed the second most positive opinion after the government). Broadly, these figures may reflect the fact that government stakeholders may be more reluctant to be critical of the policies and policy processes that they are responsible for, Specialist interest groups are also more likely to be dissatisfied because of the complexity and multiplicity of policies, some of which they may believe do not help or meet their needs or agendas. Governments and academics may be more likely to see the big picture. However, insights into these results are discussed in the next sections. These scores may help to reflect on the experience of each of thes interst groups and help t outilise the opinions of those with negative and nuanced views to improve the policy system so that it is more beneficial to a wider variety of stakeholders. Interview responses,

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discussed in the next section give more detail about the reasons behind the figures seen in Figure 53, and help understand the potential differences.

Comparisons of interviews across the five case study countries can be made based on the themes identified as important for understanding policy effectiveness. There is a variety of opinion across the case study countries, but there are some aspects that represent common or similar opinions and perceptions of effectiveness, including stronger positive assessment of democracy and less positive assessment of efficiency (see Figure 53). A comparison of perceptions may reveal something about the influence of context and some universal aspects important for effectiveness of PG management policies.

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Figure 53. Mean score of attitudes towards relevance, democracy, legitimacy, efficiency, and impact across five European countries (1 = negative, 2 = nuanced, 3 = positive).

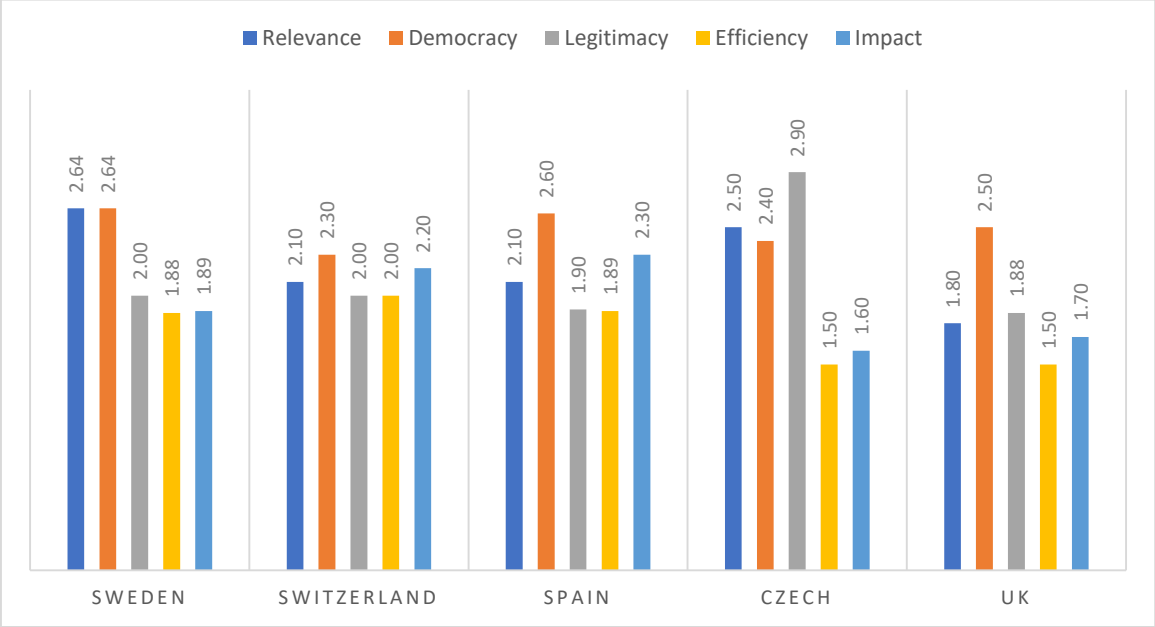
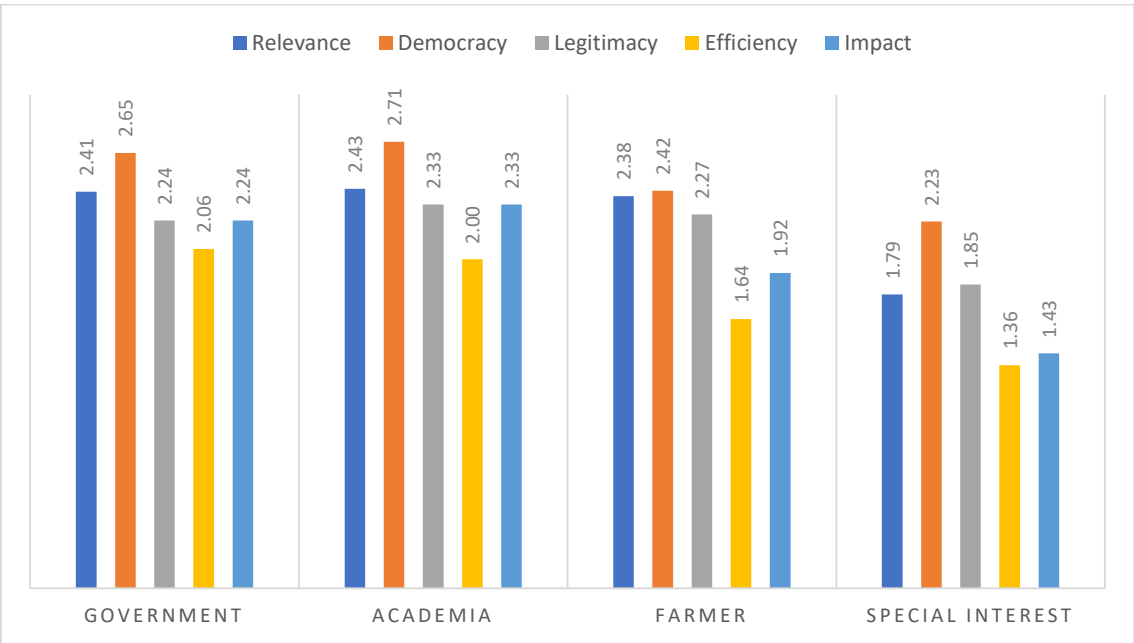


Figure 54. Mean score of attitudes towards relevance, democracy, legitimacy, efficiency, and impact across stakeholder type (1 = negative, 2 = nuanced, 3 = positive).



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4.3.2.2 Qualitative comparison of perceptions of effectiveness

Interviews were also qualitatively compared across case study countries and across themes. This section gives details of the opinions shared by the interviewees in relation to the core characteristics of effectiveness including relevance, legitimacy, democracy and efficiency. Two sections also detail stakeholders' opinion on unexpected consequences of policy, as well as desired change.

4.3.2.2.1 Relevance

Most interviewees agreed with the list of polices arising from the Delphi study and in general, most interviewees stated that there were some policies or parts of **policies that are relevant for PG** in their country. CAP pillar I and II policies were named as some of the most important, in particular CAP pillar II polices were named as most relevant by some Czech stakeholders and CAP pillar I and II by some Swedish interviewees. In Spain, interviewees' perception of the effectiveness of public intervention in PG of the dehesa differs widely depending on the policy and instrument analysed. In the UK, some people stated that CAP policies were important, naming agri-environment schemes, basic payments and payment for Less Favourable Areas (Scotland) and cross compliance. Some UK interviewees equally mentioned environmental policies such as the designation of Special Sites of Scientific Interest (England and Wales) and planning policy focusing on Environmental Impact Assessments. In Switzerland, a number of stakeholders agreed that the policy mix identified by the research team was adequate and good, and showed the important policies. One Swiss interviewee stated that direct payments provided a good basis, but were in need of development.

Interviewees mentioned a number of reasons why polices are relevant or qualities that they thought contributed to policy relevance. For example, in the Czech Republic interviewees mentioned that in PG policy there should be an aim to develop multifunctional agriculture (farmers interest), support family farming and environmentally friendly food (local action group), as well as support traditional and organic farming that maintains soil fertility and reduces negative environmental impacts (marginal areas interest). In Spain, interviewees generally perceive that the problems related to the provision of ES by pastures have been little taken into

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account in the design of policies, especially in the first pillar of the CAP. However, they recognise that it contributes to maintaining the supply of ES by the PGs to the extent that it financially supports the continuity of farm activity. The more specific the policies are, the better the interviewee's perception in terms of relevance. For example, the second pillar of the CAP (Rural Development Program of Andalusia) is better valued than the first pillar, but less than other policies such as the Dehesa Master Plan of Andalusia. In Sweden relevant policies were seen as providing a reasonable level of compensation for the farm (Environmental Protection Agency), distributing support money (farmer interest), and those that focused on the link between socio-economic benefit and environmental benefits to pastures and cultural environments (Board of Agriculture). In Switzerland, policies were considered relevant insofar as they promote a balanced delivery of agricultural and environmental quality objectives (government), within the Constitutional principle of multi-functionality of agriculture. Relevance was also associated to the quantitative effects that the policies caused in terms of preservation of PGs, e.g. difficulty to convert PG into arable land (environmental interest). The grassland-based milk and meat production (GMF) program was named as a good example of a win-win policy instrument, according to one interviewee, due to the "principle of graduated management", which implies different grassland management in different types of grassland (Researcher).

In the UK a variety of reasons for relevance or importance of policy were given. For SSSI policy, the reason for its importance was seen as long-term protection for grassland and the ability to conserve and maintain grassland (Natural England). The EIA policy was seen as important but only when there was a positive dialogue with the landowner (Natural England). A system of Payment by Results was stated by some interviewees to be a potentially more relevant policy approach than present because it give farmers more responsibility. Policy was also seen as having a role in correcting market imbalances, and that policies that had more of an objective and referred to the viability of the system were more relevant (environmental interest). One interviewee believed that legislation should not be disruptive to normal farming practice and that farmers should be able to maintain their land (farmers' interest). Another stated that tools associated with policy delivery should be accessible and usable by all, not just policy officials (environmental interest).

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There were also many comments pertaining to **irrelevant aspects of policies or issues with policies**, both touching on design and implementation of the policies. Regarding the inclusion of the problems related to permanent pasture in Spain, the interviewees considered that the objectives of the first pillar of the CAP did not respond to the problems of permanent pasture mainly because it is too generalist: this policy does not take into account the particularities of the pasture and its lays down requirements are not in line with the reality of this agro-ecosystem (such as, for example, the establishment of the grazing eligibility coefficient). Payments for the provision of ES have not been included either. As mentioned above, as the specificity of the policy increases, the perception of the interviewees about the adaptation of the policy to the problems of the pastureland improves. However, although the second pillar of the CAP is better valued, some interviewees point out that the EAFRD regulation itself has prevented the development of measures that would be even more appropriate for the resolution of specific problems, such as, for example, in the case of the maintenance of agroforestry systems such as the pasture. In Sweden, an interviewee believed that the costs were too low to compensate farmers of difficult to manage land, and another that policies aimed to preserve arable land (rather than promote grassland). They were also concerned about the effect of the current policy mix on increased food production, cultivated area and number of cows, which would contribute increased greenhouse gases. In Switzerland, the main issues also touched on the outcomes of the policy mix in a failure to meet environmental objectives, and in resulting in too much pollution (particularly, nitrogen deposition and ammonia emissions) and decreasing biodiversity in Switzerland. The implementation of policy was also seen as problematic, including the administrative burden, which is believed to be increasing over time, making it more and more difficult for farmers. A number of stakeholders referred to an existence of a trend toward intensification resulting from incentives from agricultural policy. Another interviewee mentioned the contradictory nature of some policies and a distinct lack of coherent PG policy.

In the UK, a lack of policy in relation to food was seen as important for grassland management. Where SSSIs were seen as positive when in existence, their geographical coverage is small and a number of interviewees mentioned the difficulty of managing and protecting areas not within the SSSI areas. One interviewee mentioned the lack of relevance of the Welsh agri-environment schemes as they did not link up to what farmers were already doing, particularly outside of

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designated areas. Similarly, to Switzerland the administrative burden of agri-environment scheme cause problems, as well as the lack of support that agencies can provide. The design of the policies were also seen as problematic as they favoured larger areas and are very prescriptive according to one interviewee. Similarly to Sweden and Switzerland, the outcomes of the policies are seen as problematic with some interviewees mentioning the presence of abandonment and afforestation at local levels. Several interviewees mentioned issues around the definition of semi-natural and PG within policy, and therefore that relevant policies should recognise that these terms mean different things to different people and often conflict in different legislation. Another example of an irrelevant policy was given where the design had been inspired by one context (for example, maize monocultures in Germany) and applied across Europe where this particular context may not apply. Equally where the interviewee feels that the policy may have been designed out of context (e.g. by people with no experience of upland hill farming and hay meadows) meaning that that interest is omitted from agri-environment schemes. Relevant policies were seen as those that would help tackle ongoing problems and contexts including Brexit and issues such as climate change and rewilding. Another issues for policy relevance was seen to be a lack of data about grasslands, including their extent and condition.

Overall, there appears to be relevant PG policies in existence across the five case study countries and a broad agreement that CAP policies (in EU countries and core Agricultural policy in Switzerland) may have the strongest influence, although as part of a policy mix and not without their issues. Relevant policies are seen as those with clear aims that meet the needs of diverse groups and that are fairly and resourcefully implemented, and that result in desired effects through land use change and environmental and socio-economic improvement. However, there are issues to tackle in relation to building a relevant policy mix including accounting for context, tackling difficult current and future issues, and ensuring that problematic trends and effects can be reduced as a result of the policy design and implementation.

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4.3.2.2.2 Legitimacy

Each of the case study countries assessed legitimacy in a slightly different way, which is perhaps reflective of the different political systems or even the way in which the question was phrased by interviewers. As a result, some interviewees assessed the level of legitimacy through assigning its importance to policies (CZ), others understood legitimacy through the level of inclusion of their needs (SP), others though support for policies and many other criteria. Moreover, each interviewee contributes some information or evidence to the way in which their country either fulfils the relevant criteria for legitimacy or falls short. Therefore, there is no consistent way to assess legitimacy between countries as different criteria and descriptions are used. However, it is possible to explore the details of the characteristics described by the interviewees.

In Sweden, the majority of interviewees stated that the policies in place were believed to be important, both in themselves and in relation to PG maintenance, for pastures, and cultural and farming landscapes. This is an interpretation of a characteristic of legitimacy. Stakeholders also assessed other characteristics or effects that related to legitimacy, sometimes through expressions of wishes for future improved policy and sometimes through descriptions of current polices. From a combination of descriptions from each case study country, it is possible to build a picture of the characteristics of legitimacy in relation to principles and approaches, targets and aims, design, and process and implementation (see Figure 55 below).

A number of stakeholders mentioned the principles and approaches that should underpin the policies around grassland management. For example both representatives from the UK and Switzerland mentioned the importance of looking at and valuing (perhaps through quantification) the ES that come from multifunctional grassland, as they are valuable compared to other habitats and are a vital part of successful agriculture in the grassland area. Although there was no direct assessment of the current valuation of ES, it was described to be an important focus by both interviewees. In Sweden, one interviewee mentioned that farmers in the country are accepting of management constraints in relation to environmental objectives as

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long as they do not interfere with profitability and competitiveness. This is therefore a desire to balance these aspects if the policy is to be legitimate. It is also a positive assessment of the legitimacy of policy in Sweden according to this interviewee.

The targets and aims of the policy were seen to be important for legitimacy in Switzerland and Czech Republic. However, several Swiss interviewees acknowledged that in Switzerland none of the 13 environmental goals laid out by the Federal government have been met to date, which suggests that the instruments put in place to realize those objectives have been unsuccessful. They note that ambitious agro-environmental goals are the expression of a consensus achieved between agricultural and environmental interests. Therefore, the achievement of those goals should be important. In the UK and Switzerland, stakeholders believe that PG and grassland environments should be the focus of specific policy for grasslands. In the UK, the interviewee acknowledges that the focus on grassland within current schemes is not very strong and that ideally it should have a shared common purpose in order to gain clarity in what is aiming to be achieved.

In Spain, in the case of the first pillar of the CAP, it should be noted that half of those interviewed stated that they had not participated in its design and those who stated that they had participated were of the opinion that, although the Administration collected their demands through participation processes, these were not ultimately reflected in the design of the policy. Therefore, the groups felt little or very little identification with this policy, especially the environmental organisations. In the second pillar of the CAP (PDR for Andalusia), eight of the ten interviewees consider that their needs and interests have been included, to a greater or lesser extent, in the design of this policy.

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Figure 55. Stakeholder expressions of grassland policy legitimacy in each country.

Legitimacy is…..

Principles and approach
CH - UK - Valuing ecosystem services
CZ - High degree of adaptability
CZ - Proving to younger generation that farming is worth it
UK - Consistency in policy
UK - Farmer choice and decision-making
UK - Results based approach
SE - Balance management constraints and profitability
CZ - Community driven development and support

Targets and aims
CH - Meeting environmental goals
CH – UK – Targeted PG policy
CZ - Preventing abandonment
SP - Interests taken into account

Design
SE - Better designed aid policy
SE - Clear definition of meadows and pastures
SE - Subsidies should be larger
UK - Land in longer agreements

Process and implementation
UK - Being listened to and consulted
CH – Find common ground through dialogue
UK – Well-resourced farm advisors
CH - UK - Farmer responsibility and motivation
CH- UK - Regular evaluations and monitoring
SP- Policy acceptance
CH – Farmers happy with the rules

4.3.2.2.3 Democracy

In relation to democracy, it is perhaps a little more difficult to compare across contexts, as each country has their own system of interaction between relevant stakeholders involved in political processes. Equally, each country has their own power relations, which play out differently in relation to environmental policy.

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It is possible to broadly compare across stakeholder types and between the different countries in order to gain insight into the ways in which different types of stakeholder might be successful in influencing policy, their different modes of influence, any dissatisfaction or lack of influence reported and a chance to assess whose voices are thought to be loudest.

Firstly, with the exception of a few, most stakeholders, regardless of country or type stated that they had some form of **opportunity to become involved in policy design and implementation**, whether through consultation, discussion, comment on new policy, work with other stakeholders, or participation in working groups, partnerships or pilot schemes. Where some stakeholders only described in general the way that their organisation or interest might become involved, some stated the successfulness of the involvement. For example, in Sweden a farmers' interest group described that their interests are being listened to and often implemented. Similarly, in the UK a representative on an environmental NGO stated that they had had some influence recently when working with other organizations to change the consideration of inclusion of trees and shrubs in the grassland definition used in policies. In Spain, with regard to the first pillar of the CAP, half of those interviewed replied that they had not participated in the design of this policy and that they do not know whether other entities belonging to their groups have done so. All agreed that this is a rather rigid policy that does not allow for major changes. In the case of the second pillar of the CAP (Andalusia RDP), interested groups have been able to participate in the design of this policy through the Participation Commissions. The convocation of these groups is carried out by the EAFRD management authority, it is obligatory and its procedure is officially established by the EU. However, one of the environmental organisations interviewed stated that in general the processes of participation in the design of RDPs in Spain have not been carried out correctly, and that for this reason they submitted a letter signed by more than 50 organisations to the European Commission at the time. Regarding other policies, such as the Dehesa Master Plan, the Habitat Directive, the Nitrates Directive or the Climate Change Adaptation Strategy, most of the interviewees stated that they had participated in their design by attending meetings, participating in working groups, etc. Other stakeholder groups for other countries varied in their description of their involvement, but most described some form of participation.

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This holds particularly true for Switzerland, where a semi-direct democracy is in place. The Swiss political system prescribes an iterative, consultative process of policymaking: for a piece of national legislation, first an expert group of the federal administration prepares a draft, which is presented to different federal departments in an inner-administrative consultation. Secondly, the government carries out a public consultation in which citizens, interest associations, political parties and cantonal authorities can voice their position. Thirdly, to become federal law, a relative majority in both chambers of parliament must approve the draft. Finally, direct democracy comes into play with the facultative national referendum, which can challenge the new legislation.

In relation to **lack of participation or influence,** a number of interviewees expressed issues with their current level of contribution. Although these issues were spread across many different stakeholders, there was a lack of mention of such issues from government agencies, whereas there were a number of comments from farmers' interest groups and unions as well as environmental NGOs, environmental agencies and other interest groups. This is likely reflective of the responsibility of government agencies to design and develop policy and the difficulty in perhaps being critical of their own processes in an interview setting. In Spain, a number of interviewees of an environmental NGO´s and an agrarian union expressed a concern that they were not involved, consulted, or their ideas were not taken into account, and an environmental NGO related to young people in Sweden. Others stated that they were sometimes involved but wanted to be more closely involved including the Swedish Environmental Protection Agency, a farmer society and a pasture and herding association in Sweden, and a specialist grassland representative group in the UK (recognising that it is difficult with a small team to go looking for relevant consultations where there could be more targeting to improve involvement).

Other groups were **critical of the processes of involvement** in general, for example, an interviewee from an environmental agency (advisory to government) in the UK stated that the Environmental Impact Assessment policy had a token amount of public consultation. Equally, the board of agricultural directors of the Swiss Cantons claimed that the consultation process was a sore point. The Federal Office for Agriculture in Switzerland also described the difficulty in gaining good response to consultations, perhaps pertaining to the results rather than the

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process, but acknowledging that not all stakeholders are satisfied. For a farmers union in the UK it was stated that although members on the ground were engaged in general, when there was a high level of detail needed for something small, it is difficult to get engagement. A representative of the Environment Agency (advisory to government) in the UK communicated that the government dictated their level of influence, as it was the government who decided whether to take on board the advice given to influence policy. This shows that there is a reliance on the broader model of governance for the level of influence of each organisation. In Spain, interviewees from various groups, especially those belonging to environmental NGOs, stated that although they had participated in the design of policies through participation processes, their demands had not finally been reflected in the policy or only a few had been included. Therefore, the groups mostly felt little or no identification with the policy, especially in the case of the first pillar of the CAP. Interviewees from the agricultural administration argued that the policies have been designed in the best interests of all groups. However, it is not normally possible to meet all the needs of one particular group since they may be to the detriment of those of another.

Some interviewees were able to comment on the **relative level of influence of different organisations** in their country, for example in the Czech Republic, the Nature Conservation Agency acknowledged that there seems to be political support for large farms and that economic interests are most important. In Switzerland, tensions exist between the cantons and federal government, where the canton want to be heard more but the federal government believes there is too much talking. Equally in Switzerland, representatives from the government and special interests state that there has been an intensification of pressure from the agricultural industry, which makes it difficult to break the inertia in a system that favours the status quo and dilutes efforts aiming at safeguarding environmental objectives. In Spain, a number of interviewees from environmental NGOs stated that farmers' organisations have more influence than NGOs.

Such levels of influence show the dynamics of the approach to governance in each country. It is difficult to assess the nuances of the relationships and levels of influence, particularly based on just a small number of interviews, however it is clear that there exist processes of influence that

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some stakeholder are satisfied with and have been able to demonstrate past or ongoing influence on policy change. There are also areas that could be improved including the level, opportunity and method of engagement with some organisations who would like to be more involved. In some countries, there are certain interests that appear to have more influence than others do, reflecting the roles of each types of organisation and therefore the power imbalances in existence in current systems of policy development and implementation. The mode of governance in each country is tied to the mode of design and implementation of policies relevant to grassland management and therefore an important consideration in effectiveness.

4.3.2.2.4 Efficiency

Stakeholders in each country attempted to comment on the efficiency of policies and the policy mix for PG management. Some found it difficult to judge, difficult to answer or felt unsure of their knowledge about the topic, or ability to produce examples of efficiency (some interviewees from Sweden, Switzerland and the UK). One interviewee (UK) questioned the use of the term efficiency and advocated for the alternative concept of resilience to be the focus, stating that efficiency can be seen in the wrong way e.g. profit seeking farmers may be the most efficient, but it does not mean they are creating sustainable or resilient landscapes. Most stakeholders accepted the term efficiency and many referred to financial costs associated with policies as part of discussing efficiency. For example, in Spain, many stakeholders questioned that budget allocation of the instruments related with PG was sufficient to achieve the appropriate benefits for society. In Czech Republic, one stakeholder discussed the value of public goods (and the government's lack of awareness of value) in relation to rates of pay to farmers in Less Favourable Areas (LFA) and the difficulty in dealing with increasing LFA area leading to decrease in rates and support overall. In Switzerland, a number of the interviewees mentioned the high cost of the system, both the agricultural system and the payments system. Some believed the high costs were justified; others thought the money could be spent in a better way. In the UK one interviewee questioned the origin of costs when talking about efficiency – costs to who? Another mentioned the importance of viable farm businesses and the importance of overheads to farmers; others mentioned the administrative cost of the agri-environment schemes for

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governments. One stakeholder mentioned the simple fact that money availability really affects grassland.

Whilst there were a variety of ways that stakeholders interpreted and talked about efficiency, some were able to give a **positive assessment of the efficiency** of policies in their country. For example in the Czech Republic stakeholders stated that the conditions were set to the appropriate level and that goals such as reducing the risk of abandonment of land have been achieved, and PG's share of land have increased thanks to the measures. In Spain, interviewees assessed efficiency based on the adequacy of the budget for the achievement of objectives and a number of stakeholders claimed that CAP Pillar I objectives would be achieved. Others thought that for greening policies, additional payments and ecological agricultural instruments they would achieve their objectives but in a low degree. In Sweden, pasture remuneration was seen as most budget effective linked to the ability to increase area of pastureland if there is very high support that increases the profitability of grazing-based production. However, another stakeholder in Sweden stated that compared with other employment policy measures, several of the rural development programs are effective, stating that the greatest impact on employment is the farm subsidy, both in agriculture and in rural areas and in Sweden as a whole. In Switzerland a number of interviewees believed that the budget and policy measure were justified, and that the system, despite being complex, is well balanced and copes with many competing aspects and responds to several interests. Particular aspects of policies mentioned as positive (in good proportion to costs) in Switzerland were federal strategies (such as climate strategy, biodiversity strategy, antibiotic strategy, wastewater treatment, pesticides action plan, etc.), grassland-based meat, and milk production, particularly animal welfare contributions. In the UK, efficiency was tied to the fact that polices had done their job to maintain PG, and have beneficial effects.

Many interviewees assess the efficiency of policies on their achievement of goals; this is often proven through **monitoring and evaluation of policy effects**. Spanish and UK interviewees mentioned monitoring in relation to their ability to assess the efficiency of policies. In Spain, many stakeholders mentioned the fact that where policy instruments had been well designed they were often only recently implemented therefore the results could not yet be perceived in

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relation to efficiency. In addition, in order to measure the effects derived from the implementation of the instruments and the degree of execution of their objectives, all policies have a battery of official indicators. However, the majority of interviewees consider that these indicators focus on issues within the scope of implementation (e.g. number of applications made, area covered by aid, etc.) but are not sufficient to be able to measure important effects such as changes in biodiversity or in the provision of ES. In the UK, many interviewees mentioned the lack of data and monitoring programs available, sometimes due to a lack of, and cuts in, resources. Some mentioned the disparity between data available for protected and non-protected grassland areas. This links to a difficulty in some stakeholders to assess the efficiency of policy if they cannot know or prove the effects that the policies have had. In Switzerland, for instance, the 2016 progress report of the Federal Council on the 13 agri-environmental objectives recognized not only that none of these objectives have been achieved to date, but more worryingly, that for 9 of them it is absolutely uncertain whether they will ever be achieved, given the lack of data (e.g. soil erosion), metrics (e.g. effects of soil pollutants on human health), and tools (e.g. pesticides action plan, climate strategy, etc.). There appears to be a huge disconnect between policy objectives and implementation/monitoring tools. In particular, what seems to be missing is an integrated ES assessment and monitoring system to improve the calibration and gradual adjustment of policy instruments towards the achievement of the stated objectives across all their dimension, and minimize unintended effects and trade-offs. Such a system could also be used to improve the level of acceptance and adoption, hence effectiveness, by increasing knowledge of results and impacts for all stakeholders concerned.

There was significant comment on the ineffectiveness of policies or the issues and challenges that surround policies that may contribute to an assessment of their efficiency. These negatives association can be split into comments around the fact that some policies have not met expectations, standards or targets; that there are problems with the process of policy implementation; or that there are problems with the logic of policy.

In relation to **inefficiency as judged by unmet expectations, standards or targets**, in the Czech Republic it is seen that the desired reduction of biodiversity loss has not been achieved, for example, one stakeholder stated that despite the extensification of grassland use, there is a

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further decline of grassland related biodiversity (e.g. declining bird population). At the same time, the yield was seen to be significantly reduced. Although the stakeholder believed this was partly due to drought, it contributed to their opinion on efficiency. In Spain, a number of stakeholders were concerned that objectives would not be achieved, or will be achieved but to a low degree, that related to specific problems in the dehesa. In Sweden, one interviewee gave the example that the area of meadows in Sweden has reduced dramatically today, and only scattered fragments remain (due to the current policy mix). In Switzerland, the money spent on biodiversity is not seen as efficient because it achieves poor results. Biodiversity does not necessarily respond in the expected way to interventions and despite area targets being reached, the quality is not good. Another interviewee emphasized evidence showing that none of the thirteen environmental quality objectives of agriculture set by the Federal government in 2008 have been achieved, giving the example that nitrates/ammonia has very severe surpluses, bird indexes are negative, etc. (re. Federal Council Report of 2016). Another stakeholder claims that with the same amount of money so much more could be achieved.

Inefficiency can also be judged by **problems with the process of policy implementation**. In the Czech Republic, the effectiveness of measures was claimed by one interviewee to depend on the responsibility of farmers; and high administrative burdens were seen to limit farmers' adaptability to changing conditions, and thus farmers were unwilling to invest in new technologies. In Sweden, a stakeholder representing nature conservation in the North reported that administration for policies is too high and takes too much of the budget, and equally, that are too many details about the policies, thus are confusing and inefficient to implement. In Spain, the reason for the lack of achievement of the objective of the instruments is linked to 'bad implementation'. This is stated as manifesting in bad distribution of budgets, especially in biodiversity-focused instruments, and the fact that the money does not reach those who need it most. It is also claimed to be due to funds arriving with the farmers slowly, and usually arriving too late to solve the problem. Moreover, farmers do not often apply for payments associated with second pillar biodiversity instruments, for example, and, in many cases, the funds are neither implemented nor spent. In Sweden, a similar problem is claimed to occur due to a strong belief among farmers that the policies are too complex, the rules too difficult to follow and often too many hurdles to overcome to be compensated. In addition, similarly to Spain, there is also

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a belief that the compensation has not always gone to those most deserving. In the UK, one stakeholder stated that there are examples where farmers have not been paid and get advice from lots of different agencies, which means that the process is complex and frustrating and therefore not efficient or effective.

Policy logic is also a reason for inefficiency in PG policy. For example in Spain some interviewees claim that particular policy instruments were not well designed, and therefore do not achieve their targets. The budget allocated to the second pillar is insufficient to address its objectives and other policies do not have specific financial instruments and depend directly on EAFRD funds (policies such as the Pasture Master Plan of Andalusia, the Habitat Directive, etc.). In Sweden, interviewees have highlighted issues with the environmental compensation rules for grassland in relation to the link between definitions and farm support. In addition, in Sweden one interviewee mentioned problems with a particular policy to help restore pasture, which does not take into account the complexity of preserving cultural pastures, and there is a lack of money for restoration and a lack of recognition that farmers are getting older. In Switzerland the Grassland-based Milk and Meat Production policy is criticised as an excuse to distribute money and make farmers look green, meaning that efficiency is very bad. One Swiss interviewee agreed, "There are more perverse incentives than positive ones", which therefore hinder the achievement of sustainability goals in PG management, particularly in terms of quality, as indicated above. While the analysis of the full spectrum of policies with a negative effect on PG was outside the purpose and scope of the present study, several interviewers acknowledged a broader issue of lack of policy coherence, which may explain some of the observed negative trends. The general approach to direct payments is also explicitly mentioned in relation to the question of efficiency, where farmers receive most of their income through direct payments and are dependent on them. One interviewee claims that ‘this is basically wrong’. There is also a belief that the focus on subsidy support for production and food security takes emphasis away from compensating the non-food producing part of farms, which are then linked to ecological requirements. In the UK, one interviewee also mentions the focus of agri-environment schemes on income foregone, placing value only on what is lost rather than what could be gained. This shows that there may be benefits for policy effectiveness if benefits and value-added are the focus, rather than compensating loss of income.

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In counteraction of the negative assessment of efficiency, in many countries the interviewees stated **ways in which they hoped efficiency could or should be achieved in the future**. For example in Spain, there are no monitoring results because the instruments are still being implemented. Despite implementation or design deficiencies, it is expected that the instruments will contribute to maintaining the supply of ES by the PG, although due to these deficiencies, the results will be worse than initially planned. In Sweden, there is a recognition by a number of stakeholders that there are still problems of PG management and a need to think through and develop new ways in securing biological and cultural heritage. One interviewee has faith in the new CAP reforms to resolve problems of complexity. One interviewee explains that there is cooperation between the Swedish Environmental Protection Agency and the Swedish Board of Agriculture to work for a strategically based consensus on how the various funding opportunities should be used to ensure the long-term survival of grassland types in the most efficient way possible. They have proposed the potential need for guidance to county administrative boards to achieve this. In addition, one stakeholder from Sweden mentioned that instead of single farm payments, grassland support should be introduced. In Switzerland, there is an emphasis on the need to improve biodiversity instruments and to spend the money in a better way to achieve higher efficiency. In the UK, one stakeholder highlights the need for more training for advisors and for an integrated approach to policy design and delivery, so that objectives can be achieved and so that farmers do not get mixed messages. Another interviewee agrees with the need to integrate, through links with Defra and through linking urban and rural productivity to improve efficiency.

In relation to efficiency, some stakeholders are able to judge that the objective of some policies have been achieved and that the resources and budget allocated are justified. In other ways, it is difficult for some stakeholders to assess the efficiency due to a lack of evidence and data about the performance of the policies. Stakeholders were able to comment on the problems and issues with policies linking inefficiency to a lack of achievement of targets and goals as well as expectations for what the policy should be able to achieve; to the implementation of the policies, often based in the complexity of the policy and administrative burden putting off farmers from participating or poor design meaning that the money does not reach those most in need. A number of stakeholders are hopeful that better efficiency can be achieved, through

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reform of current policy and through wider discussions between institutions and stakeholders about how to best design policy that achieves integrated goals.

4.3.2.2.5 Unexpected consequences

The five case study countries gave a number of examples of unexpected consequences in relation to policy relevant to PG. Often the examples could be broken down into drivers and effects (Table 27). Most examples included an explanation of both, but in some cases the details of the interviews reported only allowed effects to be described. Some of the drivers of problems were described by multiple countries including biomass energy policy, and requirement of minimum or maximum livestock per ha, but with different consequences described. Some generic effects were described by multiple countries including abandonment, and lack of uptake of schemes, but with different drivers mentioned. Only one interviewee from Switzerland (FOAG) mentioned a lack of specific negative impacts from any of the instruments listed by the research team. Most interviewees mentioned single consequences arising from single drivers, perhaps because it is easier to describe this way, but two interviewees in the UK identified on the complexity of unintended consequences. For example, one mentioned that in one specific context in Dartmoor a number of factors had combined to produce unintended effects; the stakeholder states that 'policy had perceived that there was a general problem of overgrazing – this combined with foot and mouth disease, policy on culling herd if TB found, and lack of agri-environment schemes led to land abandonment'.

Drivers listed in Table 27 are described at the cross-policy level (e.g. lack of clear definition of PG, promotion of new technologies,) policy level (e.g. forest policy), instrument level (fertiliser ban and manure restriction) and implementation level (administrative burden). Consequences are described multiple levels in relation to landscape change (e.g. maize production, trees planted, land abandoned), action or management (e.g. lack of technical innovation, PG ploughed out, uptake of schemes), market, populations and personal change (e.g. imports of food, rural depopulation, poor mental health). These wide ranging consequences show the depth of impact that policy can have, but also the complexity of the experience of policy impact and consequence.

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Overall, there are significant ways in which the current policy mix is having unexpected consequences on multiple levels. Some of the drivers may be the same in each country, but equally there are multiple differences in each national context. There are universal threats and risks to PG that result from the variety of drivers, including abandonment and lack of uptake of schemes. However, equally, it is also not possible to say whether the effects and drivers do not exist in all the case study countries, and their lack of repetition may be a result of the stakeholders who participated in the interviews as well as use of different phrases and scale by which to describe the problems and effects.

Table 27. Drivers of unexpected consequences and perceived effects by country

Driver of unexpected consequences	Effect/ consequence	Country
Administrative burden	Lack of technical innovation	CH
	Lack of uptake of schemes	CH, UK
Biodiversity subsidies	Counterproductive for extensive meadows	CH
Biomass energy policy	Increase maize production	UK
	Invasive species supported	CZ
Decoupling payments and actions	Abandonment	UK
Fertiliser ban and manure restriction	Change in species composition	CH
	Manure increase on unrestricted areas	UK
Forest policy	Trees planted on grassland	UK
High threshold for action (EIA)	PG can be ploughed out	UK
Lack of clear definition of PG	Businesses in limbo – delayed payments	UK
Less grass production	Higher imports of food	CH
Policies focusing on just one element	'unintended consequences'	UK

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Policies not adapted to local context	Farmers don't receive payment from EU because they have too many trees in their PG.	SE, ES
Policy does not account for natural processes and change over time	Agri-environment payments are not effective because the land is naturally changing	UK
Political context (Brexit)	Reduced uptake of schemes	UK
Poor implementation of Pillar II schemes	Lack of uptake of Pillar II schemes	ES
Requirement of minimum or maximum livestock per ha	Destocking uplands – land abandonment	UK
	Increase stock on lowland meadows	UK
	Poor management – minimum effect on biodiversity	CH
	Decreasing PG productivity	CZ
Strict laws and regulations	Farmers driven by eligibility criteria	CH
	Frustration by farmers, who are dictated how to operate	CH
Support for productive soil structure	Soil erosion	CH
Technical requirements in Pillar I	Abandonment of conservation practices	ES
	ES	ES
Policies not adapted to local context and focused on the promotion of intensive livestock	Application of measures that are contrary to ecosystem conservation	ES
	Intensification of extensive livestock production	ES
	Disappearance of farms and cessation of activity, especially of sheep. The policy has encouraged beef production over goats or sheep	ES
Application of the reference ratio of permanent pasture (Pillar I)	Dehesa farms have suffered a reduction in income	ES
	Disappearance of high value trees and shrubs	ES
	Sending a contradictory message to farmers: Farms that have received a higher payment are those that	ES

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	have a more simplified ecosystem (so they provide less SE).	
Deficiencies in the implementation of the dehesa measures in pillar II	Generation of expectations that have not been finally fulfilled	SP
	Reduction of farmers' incomes due to the time elapsing between the application for aid and the resolution of their dossier	SP
	Rejection and disillusionment among the actors involved in the management of the dehesas	SP
Little success of measures aimed to the incorporation of young people and generational change	The sector remains unattractive to young people	SP
Shortcomings detected in the design of the dehesa measures in the Andalusia RDP.	Emergence of an Operative Group of applied research in native grass species to improve the pastures of the dehesa (positive consequence).	SP

4.3.2.2.6 Desired change

The desired change varied across countries and was tailored to the specific problems or issues in each area. However, there was some cross over in some of the desirable aspects of future policy relevant to PG. There were four broad ways in which the interviewees responded in relation to desired change including talking about particular messages, principles or goals should or must be a focus of future policy; describing new or better processes and approaches to policy implementation and design in order to achieve tough goals; describing aspects of current policy that should be moved away from; and making specific suggestion about change to current policy or design of specific new policy or aspects of policy.

In relation to the **messages, principles and environmental goals** mentioned by the interviewees (Table 28), the most mentioned pertained to the need to take a holistic or whole system view. In Sweden this related to the landscape scale (academic stakeholder), and in Switzerland to the need to consider the way that policies can be fragmented if the whole system is not considered (sustainable agriculture association). In the UK and Spain, multiple stakeholders mentioned the

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need to look at the whole system, including from a landscape scale and in relation to the whole farm system when considering the values and decisions made by farmers about their land. Other themes, common to two or more countries, included:

i. The need to emphasise the care of public goods, and to ensure that models of payment support the production of public goods (UK, Sweden, Czech and Spain)
ii. Maintaining a focus on rural life, making sense of the countryside, protecting rural populations and facilitating the public's experiences of grassland (Czech, Spain, Sweden)
iii. Emphasising the multi-functional aspect of farming and the multiple benefits it can bring (Czech and UK)
iv. The need to tackle ammonia and nitrate emissions (Switzerland and UK)
v. The need to pay attention to the motivations and acceptance of policies by farmers so that policy aligns with farmers decision-making (Switzerland and UK).

Other issues were reported by just one country, and although this does not indicate that they might not also be messages and principles relevant to the other case study countries, it is reflective of the reporting mode for the interviews and may also reflect the diversity of stakeholders.

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Table 28. Messages, principles and environmental goals mentioned by the interviewees(x equates to an issue reported by at least one stakeholder).

Issue reported	Czech Rep.	Spain	Sweden	Switz.	UK
SINGLE COUNTRY PRIORITY					
Prioritise soil and water conservation	x				
Focus on economic benefits of farming LFAs	x	x			
Focus on high biodiversity value PG			x		
More habitat creation			x		
Reduce livestock intensity				x	
Support for general grassland - not just specialist habitats					x
Better protection for species rich grassland					x
Equal standards to EU laws (UK post-Brexit)					x
Importance of food security					x
Specific regulations for extensive livestock farming and for PGs		x			
Inclusion of Compensatory Payment for the provision of ES.		x			
Importance of participation processes		x			
Improvement of the farmers' training in pasture management.		x			
More applied research and knowledge transfer to the sector, especially in the field of new technologies of transformation and digitisation.		x	x		
MULTI -COUNTRY PRIORITY					
Change in farmer attitude and motivation or alignment of policy with farmers				x	x
Emphasise care of public goods	x	x	x		x

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Promote values and rural life - cultural experience	x	x	x		
Emphasise multi-functional aspect of farming - multiple benefits	x				x
Reduce ammonia and nitrogen emissions				x	x
Holistic view - landscape scale and whole farm system		x	x	x	x

In relation to **new or better processes and approaches** reported as part of desired changes, more were reported by multiple countries than the principles and messages, which could indicate that there is potential for future approaches to PG management to be applied across different European nations. The most reported approach was around access to information, knowledge exchange and data (Spain, Sweden, Switzerland, UK), which could be to do with the broad nature of this aspect to most policies. This manifested in desires for more education, more and better communication and sharing of knowledge and insights (with public and farmer organisations), better data availability and production of maps and inventories using such data. In relation to this, a number of interviewees mentioned the desire for more advisors, support for farmers and dialogue with farmers, something which a number of interviewees mentioning as vital for the success of policy in order to develop and maintain knowledge exchange and trust (Spain, Switzerland, UK). Linked to the availability of data as a desire is the improvement of monitoring processes and data collection, as indicated above (see section 4.3.2.2.4), in order to analyse progress and results of policy approaches in an integrated way (Spain, Switzerland, UK). As one Spanish interviewee mentioned, such monitoring could help to design and implement better policies.

A number of interviewees mentioned an alternative approach to current approaches that may offer advantages – payment by results, or value/ goal-oriented/ performance-based payments (Spain, Sweden, Switzerland, and UK). This focuses on giving famers goals or targets (aligned with current agro-environmental objectives) and, instead of prescribing action to the farmer, allowing flexibility for the farmer to choose how to achieve those targets. Positives of the

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schemes mentioned include, empowerment, increased trust between farmer and governing institutions, cost-effectiveness and advancing action. Although this approach to payments could be seen as a potential solution, and many interviewees mentioned the existence of pilot schemes (in UK, Germany, Austria, Ireland, Spain and Romania), a number of interviewees pointed out the issues, including that a top-down approach would not work, and that the scheme would need to be collaborative and developed in partnership with the farmers in order to function (UK stakeholder).

In Spain, Sweden and Switzerland the promotion of goods and services originating from sustainably managed PGs was seen as an important approach for an improved effectiveness of PG policies. Interviewees mentioned the importance of promoting specific regional products, giving consumers choice, and persuading people to buy meat as well as environmentally friendly products from PG. Other approaches mentioned by stakeholders in two different countries include improved participation and collaboration between stakeholders, which is linked to information sharing and exchange (Spain, Sweden); better economic recognition for ES delivery (Spain, UK); the promotion of new technologies (Spain, Sweden); and the development of key definitions of types of grassland (standardised across different policies) and aspects such as extensive stockbreeding and low and high input systems (UK, Spain).

Approaches mentioned in just one country included increasing greening payments and assessing ES (Spain), better methods of restoration (Sweden), promotion of organic (Switzerland), policy integration, skills training for farmers, focus on net gain and flexibility for farmers (UK).

An important desired change for a number of countries was in **moving away from particular aspects of current policies**. This included ensuring a reduced administrative burden for farmers, making it easier for farmers to get the subsidies and to receive them on time, by having fewer checkpoints, fewer records and a more flexible process of enforcement (Czech, Spain, Sweden and Switzerland). In Sweden, this was a very important factor in reducing complexity of the compensation processes. In Spain and Switzerland, there was mention of reducing reliance on direct payments based on the current model. In the UK, this theme also arose. Interviewees also mentioned alternative policies or improvement to current policy as desired changes, however

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there was less crossover between countries, due to policy suggestions being tailored to local circumstances. Some suggestions included flexibility in cutting dates (Czech), policies specifically for the dehesa rural context (Spain), fence subsidies (Sweden), a nutrient management tool, export promotion and labelling programme, improved biodiversity subsidies (Switzerland), promotion of use of legumes, stronger soil policy, focus on trade policy and food policy, and creation of a grassland inventory (UK).

Overall, in relation to desired changes, there was some overlap between countries about the messages and goals that should be pursued in PG policy, including emphasis on public goods, holistic view of the farming and landscape system, promoting rural life and emphasising multi-functionality and multiple benefits. Equally, there are crossovers between countries and suggestions for better or new approaches to management including information exchange, better communication, more support and advice for farmers, more data availability. The potential for payment by results or goal-oriented payments seems to be topical in a number of countries. Such similarities in messages and approaches could indicate the potential for policy to tap into such underlying principles when applied across multiple contexts. Equally, there are issues and aspects of desired policy that are specific to each case study area and that would be the focus of policies with more flexibility to adapt to context. It seems that there is a significant amount of potential for change to the current policy mix at the international and national scale to create more sustainable PG systems across the varied contexts.

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5. CONCLUSION

The purpose of this report was to identify, map, and evaluate the most relevant European policies believed to impact PG management. We accomplished this within an interdisciplinary, cross-national research team that reviewed 24 different policies in five national policy contexts, with the help of key stakeholders. We aimed to identify the most relevant policies (and types of policies) commonly applied across European countries, accounting for EU member states (Spain, Sweden, UK, Czech Republic) and a non-EU country (Switzerland). The mapping of each country's policy mix included identifying the most relevant policy instruments associated with the key international and national policies. Mapping involved collating data from government sources detailing the aims, objectives, targets, monitoring, outputs and outcomes of each policy instrument. This resulted in over 50 categories of data collected across 24 policies, equalling thousands of unique observations recorded in excel. These observations reveal the pattern of intentions and impacts within the policy mix, and help to identify the policy logics created within each context. To complement the mapping of relevant policies a bottom-up approach was taken to assess the perceived effectiveness of the policy mix in each country. This evaluation included 50 interviews with key stakeholders across Europe representing government, academia, farmers, and special interests, and covered perceptions of democracy, legitimacy, relevance, efficiency and impact in relation to the effectiveness of policies relevant to the management of PG.

We have shown that the policy environment in Europe is extremely complex, and evaluating a policy mix addressing a specific land use as a whole is difficult. This review found few policies that directly target PG, and as such, a broad range of other policies affecting agriculture, landscape, environmental change, conservation and production influenced PG management decisions. We have, however identified the central role of EU CAP policies Pillar I and II (and the key agricultural and environmental policy in Switzerland) in shaping the economic, social and environmental context in which PGs are managed. This is supplemented by other policies at the EU level including Habitats Directive, Nitrates Directive and Climate Change policies, which stakeholders in this research identified as the most important EU policy influences on PG

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management. This was due to their effect on key management decisions such as nutrient application rates and land use change, as well as the promotion of important ES and environmental protection. Stakeholders identified these policies alongside various national scale policies that address more specific issues, such as planning policies, product premiums and quotas.

Finding clear and concise policy descriptions at the member state level was challenging. However, in relation to collating detail about the aims, objectives, effects, impacts and evaluations of policies, we conclude that it was nevertheless important to compile this information so that differences in, for instance, policy rationale, measurement, and logic could be distilled and compared. It was beyond the scope of this review to fully compare and analyse all the detail within the collated data. However, this type of data opens up opportunities for future researchers to explore details of the policy instruments in each case study country and also informs future research within the SUPER-*G* project. In particular, the findings can be used to inform and substantiate recommendations regarding possible changes in future policy targets, policy instruments and implementation directions (e.g. Task 4.4). Recommendations will contribute, for instance, to the ongoing debate about the priorities of the post-2021 CAP, such as the European Commission consultation on how to introduce measures aiming to promote sustainable development, preservation of natural resources, and rural value chains in areas such as clean energy, bio-economy, circular economy and eco-tourism (Nègre, 2018). Thus, we argue that the greatest contribution in this report is the resulting empirical database and the detailed operationalization of our mapping, which can be built upon in future.

In relation to better understanding policy logics across the case study countries, we found that the mechanism evidenced in policy instruments affecting PG management is remarkably similar across Europe. The most common approach, by far, is the use of regulation and incentives to influence land managers and farmers, who in turn make decisions about landscape management, which affects the structure and composition of the landscape, subsequently affecting its functions and the provision of benefits and values (Van Zanten et al., 2014). Nevertheless, many of the policies targeting PG management justify their existence by claiming benefits towards specific ES. However, our mapping data shows **there is often a gap between**

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policy rationale to improve particular ES (e.g. improved climate regulation through carbon storage, or improved species diversity) and actual measures used to ensure that policy objectives are met. This is not surprising since policy outcomes at the level of actor behaviour, such as changes in landscape management understood through number of sign ups to a particular management scheme, tend to be easier to measure than policy impacts like the ES that flow from the landscape (Caviglia-Harris et al., 2003).

Much less common in the policies reviewed were policy logics engaging consumer demand for ES or direct payments for ES (particularly those unrelated to food and energy). One reason we did not find more instances of engaging consumer demand is that we did not include informal policies in our review—some of which include support for engaging consumer demand for ES by NGOs. Equally, ES and PG may not yet be consumer issues. Direct payments for ES may have been underrepresented because of their indirect link to PG and the way in which we instructed expert stakeholders in this review to focus on the *most relevant* policies that intend to promote sustainable PG management. However, these limitations do not explain corroborating statements from our interviewees suggesting the need for more engagement with consumer demand and direct payments for ES. They also do not explain the lack of relevant examples of policies with indirect influences (policies not directly targeting PG land management) given by the stakeholders in this review. Perhaps the general lack of (and lack of prominence of) such policies is because they are often difficult to implement and are seen as indirect (and potentially inefficient in the short term) modes of achieving given policy outcomes. Although we recognise that this review did not include informal and voluntary policies, and therefore more research is needed into the type of consumer focus taken within these, we view that there is potentially a missed policy opportunity to design and implement more consumer-led policy around ES delivery. The increased flexibility that member states will have in the CAP reform 2021 could potentially address this additional policy focus. However, this is unlikely to occur without intervention in the policy development cycle for several reasons (explained below).

Firstly, although by the nature of international policy development, decisions about direction and inclusion of new instruments emerge from powerful committees at the highest level of policy development, the power in determining how the budget is allocated in each country

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resides with the most powerful groups within each nation. Although in each case in this review, it is the government who allocates budget and designs the focus of the implementation of policy goals, in several of the countries we investigated there appears to be a significant influence of farmer interest organizations in lobbying government agencies. Some government departments are heavily staffed by (former) farmers, although this is not the case in all countries studied. The powerful voice of farmer groups could be associated with the current focus of policy delivery on regulating land management, often with the aid of direct payments for compliance, rather than promoting consumer demand for ES (other than through a small number of voluntary measures and schemes). This may be because some farmer groups are motivated by the economic incentives they can receive for producing goods and managing the land (Elliot et al., 2019), and will therefore lobby heavily for this approach to be favoured in policy delivery. However, focusing on landscape management, whether through direct payments or other mechanisms, may only indirectly ensure that management prescriptions deliver ES. Conversely, focusing on increasing demand for ES may better serve societal interest. However, the benefits that farming groups are seeking from the management of PG may be (seen to be) secondary or indirect via such alternative policies. Understandably, therefore, farmer organizations (and possibly government agencies) will prefer direct payments for managing the land, possibly at the expense of the ES delivery that other groups may prioritise.

Secondly, in addition to farmer interest groups, there are many other interested stakeholders representing societal interests ranging from biodiversity to cultural heritage, and climate. Related to the fact that PGs have a wide variety of uses and benefits at multiple scales for multiple groups, policies are not currently integrated in relation to PG management. This means that stakeholder groups may only be brought together around single issues or localities, often without the wider governance structures to integrate more formally around their shared value in PG. Where stakeholder group agendas do not align, despite their shared environment of the PG landscape, conflicts can also occur, and a disparate mix of groups and messages emerge around policy and best management practices. Much like the farmer organizations who focus their influence on increasing payments for landscape management, these disparate (and often less well resourced) groups promote their own agendas when lobbying government or implementing policy. Although some organisations with similar interests have found modes of

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interaction to form alliances, shared interest associations and more powerful lobby groups, the values and ideas of other stakeholders cannot be easily reconciled. The net result of this may be that decision-makers embrace the simplest messages and solutions, particularly where they fit current economic and political models and ideals. Often the primary rhetoric denotes that without subsidies for farmers, farms and their social networks and supply chains will disappear along with the grasslands that provide essential ES such as carbon storage, unique biodiversity, landscape aesthetics and associated cultural heritage.

We suggest that unless stakeholders that represent broader societal interests can access the structures, opportunities and resources to work through conflicts, as well as to bridge competing legislatory requirements, policies will continue to reflect the interests of landowners and land managers. Despite some evidence of success and satisfaction with the way in which stakeholder groups become involved in policy design and delivery in our case study countries, some stakeholders recognise that there are limited opportunities to become involved in PG-relevant policy processes. More democratic participation in policy processes may therefore be beneficial to find new ways of delivering PG improvements, and may mean that new instruments and policy logics emerge as favourable and acceptable beyond economic incentives for land management. To influence PG management, we therefore recognise that the type of instrument, the policy logic, policy target and mode of implementation and policy design are highly interrelated, and need to be better coordinated to achieve the multifunctionality required to deliver a range of ES whilst also maintaining productivity and sustainability of the PG areas.

Despite these limitations to current policy processes, in relation to stakeholder interviews, we were surprised by the overall satisfaction of stakeholders with the policy mixes in each country that related to PG management. Interestingly, however, the reasons for general satisfaction differed greatly between countries. In Sweden, there appeared to be a high level of trust in government and farmer interest organizations. So much so that finding experts on PG policy outside of these previously mentioned groups was challenging. The lack of external experts could be seen as evidence that in Sweden there was little demand from other stakeholder groups to better understand and influence the policy development process. This, however was not the same for all case studies, and may demonstrate that PG plays different roles in the

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agricultural landscape and agricultural livelihoods of the populations. For example, in Spain the importance of grassland management was seen to have a more direct influence on the survivability of Spanish farms in the dehesa than Swedish farmers in northern Europe, where other forms of land use are often more of a focus.

For policy makers and others who influence the policy process, there are several important lessons, the first of which is the need to aid the management of complexity around PG policy. Numerous policies affect PG management at the international as well as national scale, and the variation in our first round of Delphi policy responses illustrated this. Our stakeholders tended to be experts in one or a few policies, or generalists in many policies; very few had a thorough overview of all policies. Our document search also highlighted the complexity of sources that exist to understand and learn about the policy requirements, monitoring and impacts. Equally, it was mentioned several times in this report that complexity in applying for and complying with agricultural policy has turned many land-managers off. More importantly however, we feel that the difficulty in accessing information about policy and, in some countries, a limited understanding of this policy concentrated into too few individuals is a direct threat to the legitimacy of grassland policy. We believe that the complexity associated with the multitude of policies affecting PG management inhibits stakeholders from taking a more active, democratic role in the policy formulation process. Further development of the PAT presented in this report, or a simplified database that provides in simplified language the goals of policy, its rationale, how it is measured, and how certain we are of its outcomes and impacts would be a useful resource for stakeholder groups that represent the public interest. It may play a part in helping to engage more groups in the policy development process, which, if taken alongside reform to the logic and mechanisms used to deliver outcomes, may create more effective policy environments for PG management.

Taken together, we believe that some concrete steps can be taken to improve the PG policy landscape; preferably before CAP reforms in 2021 become institutionalized.

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- Better management of complexity. We learned that complexity is not just about compliance, it is also about understanding the system of policies in place and making them accessible to stakeholders who (ought to) have an interest in or influence on policy development.

  a. Develop a database on grassland policy that is sortable and easy to access information.

  b. Develop decision support tools (DSTs) that inform stakeholders in language they understand what policies are in place and how they relate to ES/PG management.

  c. Introduce integrated ES assessment and monitoring systems (via DSTs) to improve the calibration of policy instruments towards the achievement of their stated goals and objectives, the minimization of unintended effects and trade-offs, and the monitoring of results and impacts by all stakeholders concerned.

  d. Develop standardized goals for PG management that are connected to the Sustainable Development Goals (SDGs) and ensure that measures are standardized and SMART.

- Require stakeholder assessments to accompany strategic plans. In future, member states will have more autonomy in determining how and why CAP money is spent. Ensuring that key stakeholders are aware of, understand, and are included in drafting strategic plans should improve democracy, legitimacy, and overall policy effectiveness.

- Encourage an understanding of trade-offs between PG and ES. European policies that influence grasslands are focused on either landscape structure or ES. Those focusing on structure aim to influence (loosely defined) ES indirectly. Those focused on ES indirectly influence landscapes. Policies that explicitly target the interaction between landscape structures and ES (or target them in parallel) may be more efficient in achieving their goals.

- Encourage a balance of policy logic. This entails moving away from targeting farmers with regulation or subsidies to manage the landscape towards targeting consumer demand for ES (through information, standard setting, etc.) and the value of ecosystem service (such as direct payments for regulating and cultural services). While informational tools (such as product labelling) are being used to address consumer demand (although were not part of

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this analysis), these are informal policies. We encourage governments to take a stronger role with these softer tools.

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7. APPENDICES

Appendix A - Delphi survey, Round 1

SUPER-*G* WP4 Task 4.1c: *Review of existing policies and impacts*

We are interested in identifying the range of EU/international and national policies influencing permanent grassland (PG) management. We are looking to better understand which policies are most important and why. The information you provide in this form will help us identify which policies to focus on in our review of policy effectiveness.

1. POLICIES INFLUENCING PERMAMENT GRASSLAND

Please fill in the table below in as much detail as you can (you may describe up to six policies in any order). If you are not aware of any policies that influence PG management, place an X in this box___and proceed to the questions after the table.

	Name of policy	EU or national scale policy?	How does the policy influence PG management?	Why is it important?
1.				
2.				
Add…				

2. CONTEXTUAL INFORMATION

Please provide some basic details to help contextualise the information in the table. These details will not be associated with your name or contact details in our record.

a. Which country are you based in (please also specify if your work is international)?

_____

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b. Which of the following groups best represent your interest group/ role in relation to the SUPER-*G* project? Please mark an X in as many boxes as are applicable.

Farmer ☐
Policy maker ☐
Government (local/ national) ☐
Researcher, HEI (SUPER-*G* project partner) ☐
Researcher, Consultancy (SUPER-*G* project partner) ☐
Researcher, HEI (non-partner) ☐
Researcher, Consultancy (non-partner) ☐
NGO ☐
Society, association or initiative ☐
Levy body ☐
Private business ☐
Interested member of the public ☐
Other ☐ Please specify:_____

3. FURTHER CONTACT

We would like to be able to contact you again to further narrow down our choice of influential policies based on the information we gather in this first survey. If you would be happy for us to contact you again in approximately 1-2 weeks with a further short survey, then please provide your email address and name below. If you are returning this form by email (and therefore we have your name and email address) then please just check the box to give your agreement.

I am happy for you to contact me again ☐

Email:_____ Name: _____

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Appendix B - Delphi survey, Round 2

SUPER-G WP4 Task 4.1c: Review of existing policies and impacts

Round 2

We are interested in identifying the range of policies influencing permanent grassland (PG) and PG management. As part of SUPER-*G* WP4 Task 4.1c we are planning to evaluate the effectiveness of selected EU and national policies relevant to PG and PG management.

Round 1 of this survey asked you to share details of EU and national policies relevant to PG. In this round of the survey we want to focus on confirming the most relevant

EU policies to evaluate further in our analysis of effectiveness**.** We cannot cover all aspects of all policies but aim to include the most relevant.

From our first round result, it was clear that the sub-policies within the Common Agricultural Policy (CAP) Pillar I (e.g. greening) are of direct relevance, and therefore will be included in our further analysis. CAP Pillar I policies are therefore not listed in this round. Please consider the relevance of the following additional policies listed in Section 1 and Section 2. Please feel free to add comments.

Section 3 provides space to suggest other important EU policies we may have missed and additional comments.

4. EU POLICIES INFLUENCING PERMAMENT GRASSLAND (suggested in first round survey)

How relevant are the following policies to include in a further in-depth analysis of effectiveness?

1. ***Nitrates Directive***

   The ***Nitrates Directive*** (1991) aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface water. The mechanisms encouraging action include identifying and promoting the use of good farming practices,

Not at all ☐ ☐ ☐ ☐ ☐ Very

Don't know/ Unsure ☐

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particularly in Nitrate Vulnerable Zones in order to ensure that the right amounts of nitrogen are applied to land at the right time and place via a number of measures.

[Optional comments]

2. Rural Development Policy/ Rural Development Programme (CAP Pillar II)

As the second pillar of the common agricultural policy (CAP), the EU's rural development policy aims to support rural areas of the Union and meet the wide range of economic, environmental and societal challenges of the 21st century. The mechanisms encouraging action include: provision of training and information, advisory services, quality produce systems, physical investment in farm business, restoration, development of farm business, revitalization of rural areas, investment in development, preservation of practice, subsidies for organic farming, payments linked to Natura 2000 or Water Framework Directive, risk management toolkits, payments for areas facing constraint, cooperation, animal welfare payments, payments for forest, environmental and climate services.

Not at all relevant				Very relevant
☐	☐	☐	☐	☐

Don't know/ Unsure ☐

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[Optional comments]

3. Habitats Directive

The Habitats Directive aims to ensure the conservation of a wide range of rare, threatened or endemic animal and plant species. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. The mechanisms encouraging action amongst land managers relate to special areas of conservation: necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans are developed, and appropriate statutory, administrative or contractual measures implemented, which correspond to the ecological requirements of the natural habitat types and contribute towards the achievement of the conservation objectives. Measures are also implemented to prevent deterioration of the habitats and disturbance of the species that are targeted by the conservation areas.

☐ ☐ ☐ ☐ ☐

Don't know/ Unsure
☐

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[Optional comments]

Not at all relevant — Very relevant

4. Natura 2000

The aim of Natura 2000 network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive. Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types that are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The mechanisms encouraging actions relate to the requirement to manage the designated sites sustainably, both ecologically and economically. Member States decide how to work with nature to ensure the conservation objectives of the Habitats Directive and the Birds Directive are met across the sites.

☐ ☐ ☐ ☐ ☐

Don't know/ Unsure
☐

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[Optional comments]

5. Birds Directive

The Birds Directive aims to protect all of the 500 wild bird species naturally occurring in the European Union. The mechanisms that encourage action for this policy relate to the designation of Special Protection Areas to emphasise the protection of habitats leading to restriction on activity such as hunting, measures to protect of nesting sites and other habitats, and promotion of research.

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

[Optional comments]

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6. *Water Framework Directive*

The Water Framework Directive aims to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It will ensure that all aquatic ecosystems, with regard to their water needs, terrestrial ecosystems and wetlands, meet 'good status'. The Directive requires Member States to establish river basin districts and for each of these a river basin management plan. River basin management plans are prepared, implemented and reviewed every six years. The mechanisms that encourage action include voluntary measures to prevent nutrient and sediment runoff, as well as pollution from urban areas and water treatment infrastructure; advice, guidance and support; measures to protect aquatic and riparian habitats; and community and farmer networks.

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

[Optional comments]

7. *EU Forest Strategy*

The aim of the EU Forest Strategy is to encourage sustainable forest management both in the EU and globally. The Strategy responds to the new challenges facing forests and the forest sector. It gives a new framework in response to the increasing demands put

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

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on forests and to significant societal and political changes that have affected forests over the last 15 years. The strategy identifies the key principles needed to strengthen sustainable forest management and improve competitiveness and job creation, in particular in rural areas, while ensuring forest protection and delivery of ecosystem services. Mechanisms that encourage action include supporting rural and urban communities; fostering competitiveness and sustainability of industry through trade; providing funding to achieve climate change objectives; enhancing ecosystem services by mapping and valuing; research and innovation into new products; dialogue groups and cooperation.

[Optional comments]

8. EU Biodiversity Strategy (/Biodiversity Action Plan)

The EU Biodiversity Strategy aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity. This builds on the progress made and lessons learnt from the previous EU biodiversity action plan. The mechanisms that encourage action include the development of 8 biodiversity targets to achieve by 2020. These targets are

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

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achieved through financing, such as tracking spending and providing funding for biodiversity; through partnerships with private stakeholders and civil society; building a knowledge base through monitoring and reporting.

[Optional comments]

5. EU POLICIES INDIRECTLY INFLUENCING PERMAMENT GRASSLAND (suggestions from survey and the research team)

The following policies could be considered as indirectly relevant for grassland management. Some were suggested in the first round of the survey and have been supplemented by some other potentially relevant policies. We would like you to give your opinion on the relevance of evaluating further any of the following policies in relation to their influence on PG and PG management:

1. Renewable Energy Directive

The Renewable Energy Directive aims to establish an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020. The

Not at all relevant				Very relevant
☐	☐	☐	☐	☐

Don't know/ Unsure
☐

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mechanisms that encourage action include national action plans that set national targets and require progress to be made; cooperation mechanisms that develop renewable energy projects or renewable energy schemes; sustainable biofuel targets and standards.

[Optional comments]

2. Sustainable Use of Pesticides

Directive 2009/128/EC aims to achieve a sustainable use of pesticides in the EU by reducing the risks and impacts of pesticide use on human health and the environment and promoting the use of Integrated Pest Management (IPM) and of alternative approaches or techniques, such as non-chemical alternatives to pesticides. EU countries have drawn up National Action Plans to implement the range of actions set out in the Directive. The mechanisms that encourage action include training of users, advisors and distributors of pesticides, inspection of pesticide application equipment, the prohibition of aerial spraying, limitation of pesticide use in sensitive areas, and information and awareness raising about pesticide risks.

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

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[Optional comments]

3. EU Strategy for the Promotion of Protein Crops

In 2018 the Commission produced a "Report from the Commission to the Council and Parliament on the development of plant proteins in the European Union". The report "reviews the supply and demand situation for plant proteins in the EU and explores the possibilities to further develop their production in an economically and environmentally sound way. It also summarises the analysis of the protein sector in the EU" according to the Commission. The mechanisms that might encourage action include, the support of farmers growing plant proteins via the proposed future CAP, and under rural development programmes.

Not at all relevant				Very relevant
☐	☐	☐	☐	☐

Don't know/ Unsure ☐

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[Optional comments]

4. Urban Agenda for the EU

The aim of the Urban Agenda is to improve the quality of life in urban areas. Within the Urban Agenda for the EU, urban stakeholders, cities, regions, national governments and other organisations and businesses are working together to develop solutions and recommendations that will contribute to sustainable urban development in Europe. The mechanisms that encourage action are developed through 12 dedicated partnerships that work on developing and implementing concrete actions to successfully tackle challenges of cities and to contribute to smart, sustainable and inclusive growth.

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

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[Optional comments]

5. EU Law on Organic Production

The Regulation on organic production aims to lay out the principles, aims and overarching rules of organic production and defines how organic products should be labelled. The mechanisms that encourage action include a set of formal regulations that are updated every year and that apply to producers and retailers, detailing, for example, rules for organic aquaculture; new organic logo; clarification on labelling; rules on specific organic products; regulation on feed; plant protection products, nutritional addatives and food processing aids.

Not at all relevant				Very relevant
☐	☐	☐	☐	☐

Don't know/ Unsure ☐

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[Optional comments]

6. Quality Regulation (including labelling of 'Mountain Products')

EU quality policy aims to protect the names of specific products in order to promote their unique characteristics, linked to their geographical origin as well as traditional know-how. In 2014 new rules for using the optional quality term "mountain product" were introduced for food products coming from mountain areas. This was the first optional quality term to be introduced, as provided under the 2012 "Quality Regulation" aimed at highlighting to consumers products which have an important added value, but are not covered under the other EU quality labels. The mechanisms that encourage action include regulations on the definition and labelling of mountain products (raw material and feed coming from mountain areas and the production of processed products in mountain areas).

Not at all relevant ☐ ☐ ☐ ☐ ☐ Very relevant

Don't know/ Unsure ☐

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[Optional comments]

7. EU Climate Change Adaption Strategy

In 2013, the European Commission adopted an EU strategy on adaptation to climate change. The strategy aims to make Europe more climate-resilient. By taking a coherent approach and providing for improved coordination, it aims to enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change. Mechanisms that encourage action include adoption of comprehensive adaption strategies; provision of LIFE funds to support climate action projects; opportunity to adopt strategies in cities; identifying knowledge gaps; provision of information on cost-benefits of policies; climate-proofing the Common Agricultural Policy and the Common Fisheries Policy by providing guidance and funding for appropriate actions; ensuring resilient infrastructure; and improving natural disaster insurance.

Not at all relevant				Very relevant
☐	☐	☐	☐	☐

Don't know/ Unsure
☐

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[Optional comments]

8. EU Action for Sustainability

In response to the adoption of the United Nations Sustainable Development Goals in September 2015, the European Commission published a communication in November 2016 aimed at fully integrating the United Nations' 2030 Agenda for sustainable development into European Union policy. The mechanisms that encourage action include the issuing of recommendations on specific aspects, including climate change and the transition to a low-carbon economy; sustainable production and consumption; protection of biodiversity, water and soils; air quality; health; mobility; agriculture; cities; culture; youth; migration and poverty.

Not at all relevant ☐ ☐ ☐ ☐ Very relevant
☐

Don't know/ Unsure
☐

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[Optional comments]

6. ADDITIONAL EU POLICIES INFLUENCING PERMANENT GRASSLAND

Please list in the box below any EU policies missing from the above lists that you think are either directly or indirectly relevant for permanent grassland and should be considered in our further analysis. Please also include the reason why the policy is important for permanent grassland management.

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7. CONTEXTUAL INFORMATION

Please provide some basic details to help contextualise the opinions you provide. These details will not be associated with your name or contact details in our record.

c. Which country are you based in (please also specify if your work is international)?

_____

d. Which of the following groups best represent your interest group/ role in relation to the SUPER-*G* project? Please mark an X in as many boxes as are applicable.

Farmer ☐

Policy maker ☐

Government (local/ national) ☐

Researcher, University (SUPER-*G* project partner) ☐

Researcher, Consultancy (SUPER-*G* project partner) ☐

Researcher, University (non-partner) ☐

Researcher, Consultancy (non-partner) ☐

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NGO	☐	
Society, association or initiative	☐	
Levy body	☐	
Private business	☐	
Interested member of the public	☐	
Other	☐	Please specify:_____

8. FURTHER CONTACT

We may contact you again to ask for a final opinion on the policies we will analyse further in the research process. If you are happy to be contacted again via the contact details you have already supplied then please tick the box below. If you would like to change your contact details, please fill in below.

I am happy for you to contact me again ☐

Change of email address:_____

Name: _____

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Appendix C - Policy Analysis Table fields

This appendix contains a table of the actual codes and coding instructions used to map all policies. In addition to the information provided in the table below, additional instructions and examples were given to coders for some of the questions. For example, in question number 11, the following information and example accompanied the coding instructions:

"The Swedish Policy "Agricultural Support for Northern Sweden" argues the net value to society as follows: We have analyzed the importance of the support for farmers and the conclusion is that many farmers are dependent on the support. Without the national support for milk, 30 per cent of the milk companies in the assisted area would show a zero result or lower. If the support for milk were to be removed, we risk that parts of the milk production will disappear, which also means that jobs disappear in the countryside. When there are fewer dairy cows, there is a risk that the growth of meadows and pastures increases, provided that the dairy cows are not replaced by other grazing animals." (Source: Jordbruksverkets rapport Landsbygdens utveckling i norra Sverige under 2012-2016 p.25) See Economic dimension on p. 11 of Green Book: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf"

Question #	Code	Coding instructions
1	Institution	*Issuing entity (e.g. EU, Local Government)*
2	Policy	*Name of the policy* *(max. 50 words)*
3	Description	*Brief description of the policy aims and goals. Around 1 paragraph to summarize.*
4	Objectives	*What are the specific, measurable objectives of the policy?*
5	Scope	*Indicate the scope of the policy i.e. who does it apply to (e.g. all farmers or only conventional farmers; large farmers vs. small), where (e.g. across member state vs. specific region vs. specific types of landscapes) and when (e.g. year round vs. during winter; under conditions of drought).*

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6	Year	*Indicate the starting year of application (e.g. 2015)*
7	Offiicial reference	*Official policy reference, i.e. formal code assigned to the law/directive the policy is embedded in.*
8	Other policies	*List names and reference of other policies stated or mentioned in the policy document (e.g. CAP, Natura 2000, Habitats Directive, etc.)*
9	Source	*Provide citation or reference (e.g. URL or DOI) to the main policy*
10	Rationale (Strategic)	*What is the rationale of the policy? Focus on describing the gaps between the desired outcome and business as usual (i.e. not having the policy). If the rationale of the policy is different than the stated purpose/goals/aims/objectives, list them as well.*
11	Rationale (Economic)	*What is the net value to society (the social value) of the intervention compared to continuing with business as usual?*
12	Rationale (financial)	*What is the impact of the proposal on the public sector budget in terms of the total cost of both capital and revenue?*
13	Monitoring	*Who monitors and how is monitoring implemented? (e.g. does monitoring take place during intervention thus allowing for adjustments to take place to implementation)?*
14	Evaluation (outcomes)	*What outcomes did the policy deliver and when?*
15	Evaluation (continued change)	*What continuing change is expected as a result of the policy outcomes?*
16	Evaluation (process)	*How well did the process of delivering the outcomes work?*
17	Evaluation (unintended effects)	*Were there significant unintended effects? Describe.*
18	Evaluation (social)	*What social value was created as defined in column K?*
19	Evaluation (confidence)	*What level of confidence/certainty/trust is attributed to the estimates of impact, including social value?*
20	Evaluation (financial)	*What was the actual cost to the public sector (compare with column L)?*
21	Feedback	*What lessons were learned and what suggestions have been made for improving overall impacts/cost-effectiveness?*

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22	Policy towards land managemnt (on biogeographical level)	*Does the policy use policy instruments to target farmers/other land managers? If so, what is the instrument and what type of instrument is it? USE A NEW ROW FOR EACH ADDITIONAL POLICY INSTRUMENT*
23		*Describe the scope of the policy instrument*
24		*What is the rationale of the policy instrument and how does it compare to the overall policy rationale (i.e. compared to what was written in columns J-L)?*
25		*Does the instrument aim to influence landscape structure/composition/function? If so, how?*
26		*Does the instrument aim to influence production inputs?*
27		*Does the instrument aim to influence production processes?*
28		*What and to whom is the stated benefit of the policy instrument?*
29		*What and to whom is the stated value of the policy instrument in terms of monetary or social valuation?*
30		*What are the overall costs of the policy instrument? What are the total costs of adminstering the policy instrument /what is the amount the policy instrument spends to influence behavior?*
31		*What indicators are used to capture the effects of the policy instrument? (e.g. % of land conversion)*
32		*What is the effect of the policy instrument in terms of outcomes and impact according to official government sources?*
33	Policy Towards increasing Demand for Ecosystem Services (on biogeographical level)	*Does the policy instrument target demand for ES services? If so, what is the instrument, and what type of instrument is it? USE A NEW ROW FOR EACH ADDITIONAL POLICY INSTRUMENT*
34		*Describe the scope of the policy instrument i.e. who does it apply to (e.g. all consumer, a specific segment of consumers or other stakeholders), where (e.g. across member state vs. specific region) and when (e.g. year round vs. during winter; under conditions of drought).*
35		*Which ecosystem service(s) are targeted? (Use the Millenium Ecosystem Assessment to help identify and code services)*
36		*What is the rationale of the policy instrument and how does it compare to the overal policy rationale (i.e. compared to what was written in columns J-L)?*
37		*What and to whom is the stated benefit of the policy instrument?*

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38		*What and to whom is the stated value of the policy in terms of monetary or social valuation (e.g. farmers can charge more for organic beef)*
39		*What are the overall costs of the policy instrument? What are the total costs of adminstering the policy instrument /what is the amount the policy instrument spends to influence behavior?*
40		*What indicators are used to capture the effects of the policy instrument? (e.g. % of land conversion)*
41		*What is the effect of the policy instrument in terms of outcomes and impact according to official government sources?*
42	Policy Towards Increasing Value of ES (on biogeographical level)	*Does the policy instrument target direct payments for ecosystem services? If so, what is the instrument used and what type of instrument is it? USE A NEW ROW FOR EACH ADDITIONAL POLICY INSTRUMENT .*
43		*Describe the scope of the policy instrument i.e. who does it apply to (e.g. all farmers or only conventional farmers; large farmers vs. small), where (e.g. across member state vs. specific region vs. specific types of landscapes) and when (e.g. year round vs. during winter; under conditions of drought).*
44		*Which ecosystem service(s) are targeted? (Use the Millenium Ecosystem Assessment to help identify and code services)*
45		*What is the rationale of the policy instrument and how does it compare to the overall policy rationale (i.e. compared to what was written in columns J-L)?*
46		*What and to whom is the stated benefit of the policy instrument?*
47		*What and to whom is the stated value of the policy in terms of monetary or social valuation*
48		*What are the overall costs of the policy instrument? What are the total costs of administering the policy instrument /what is the amount the policy instrument spends to influence behavior?*
49		*What indicators are used to capture the effects of the policy instrument? (e.g. % of land conversion)*
50		*What is the effect of the policy instrument in terms of outcomes and impact according to official government sources?*

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Appendix D – Interview documents

Information sheet

Dear Participant,

Thank you very much for your interest in the SUPER-*G* project. We would like to invite you to participate in an interview, where we hope to discuss your views on the effectiveness and impacts of various policies and policy instruments relevant to grassland management. It is part of research being conducted in the SUPER-*G* project, which focuses on developing sustainable permanent grassland (PG) systems and policies.

The SUPER-*G* Project

The overall objective of the project is to co-develop sustainable PG systems and policies with farmers and policy makers across Europe that will be effective in optimising productivity, whilst supporting biodiversity and delivering a number of other ecosystem services (ES). SUPER-*G* works across 14 European countries and 20 research institutions and universities.

Outputs and impacts from SUPER-*G* include:

- Better understanding of the importance and functioning of permanent grasslands
- Increased availability and uptake of grassland management options & technologies
- Improved competitiveness of farming systems based on or including permanent grassland
- Development of agricultural and environmental policies that support optimal management of permanent grassland

To find out more about the SUPER-*G* project please visit www.super-*G*.eu

Purpose of the interview

Task 4.1c of the SUPER-*G* project aims to better understand existing policies relevant to the management of permanent grassland. Our research aims to understand the effectiveness, relevance, legitimacy, efficiency and impacts of various EU level and national level policies. Ultimately, the project aims to contribute to discussions about new or reformed management options for PG that will help better deliver environmental benefits in balance with sustainable production.

We value your experience and knowledge of the policies and/or their wider impacts. During the interview, we will provide overviews of the policies as a starting point for the discussions, and we are interested to get your opinion on the impacts and effects of the policies that you have experienced or are relevant for your interests in your area.

Topics for discussion will cover:

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- Representativeness of the policies to stakeholder interests
- Design and coherence of the policies
- Satisfaction of needs through the implementation of the policies
- Achievement of specific aims and targets
- Resources required to implement the policies
- Effects or impacts of the policies, and their opportunities or barriers to achieving objectives

Consent

We ask that you read over the consent form supplied. If you are happy with the conditions, please sign it (either on the day or in advance) in order to give your consent to participate in the project and return it to us. If you are unhappy with anything, please contact us before the interview or talk to us directly.

Recording and confidentiality

We would like to audio record the interview so that we can better analyse and get an accurate impression of what was said. If you are not happy with the discussion being recorded then please let us know.

Any information you provide in the interview is greatly appreciated and will be treated confidentially, to the fullest extent of the law. Your name will not be used in any written documentation of the research but we may refer to your representative organisation, unless you let us know otherwise. You have the right to withdraw your information from the study at any point without reason or consequence.

Data storage

Task 4.1a is coordinated by Swedish University of the Agricultural Sciences, but the data for the work in the UK is gathered and managed by Newcastle University. The information and personal data you give will be transported, stored and processed in compliance with the General Data Protection Regulation and will not be shared outside of the research team. Your contact details will only be used for the purpose stated in this information sheet in relation to this task (separate to any other consent you may have given to be contacted by the SUPER-*G* project). Should you have any concerns or queries about the storage and processing of your personal data please contact the research team on the below email addresses or contact Newcastle University Information Security Officer rec-man@newcastle.ac.uk.

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Analysis of the interview discussions

The information and opinions you share during the interview will be used to inform the research team about the impact of the policies discussed. It will form part of a wider policy analysis across five European case study countries, which has already included a desk-based research process, a number of surveys with practitioners and academics, and informal discussions with a variety of stakeholders. The findings and analysis will be summarised in a project report by the end of summer 2019. We would be very happy to share the report with you. It will also be available on the project website.

SUPER-*G* is an ongoing project. If you would be happy to hear about future projects, discussions or events related to the project, please let us know via the consent form.

Many thanks for your contributions and we look forward to speaking with you.

Kind regards,

Consent form

Task 4.1c – Review of existing policies and impacts

CONSENT FORM

Please complete and sign the following form and return to the researcher prior to the start of the interview.

1. I confirm that I have read and understand the information sheet for the study. I have had the opportunity to consider the information and to ask questions. Any questions asked have been answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my legal or personal rights being affected or violated. ☐
3. I agree that the interview discussion can be audio recorded. ☐
4. I understand that the researchers will hold all audio recordings and transcripts collected during the study confidentially to the fullest extent of the law. Efforts will be made to ensure I cannot be identified as a participant of the study (however, I understand that there may still be a risk that I am inadvertently recognised). I give permission for the researchers involved in the study to hold relevant personal data on me. ☐
    - No sensitive personal data will be collected, and personal data will be stored separately from project data.
    - After five years (equal to the project duration), all audio or video data will be erased or destroyed.

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5. I understand that other researchers in the SUPER-*G* team will only have access to this data if they agree to preserve the confidentiality of the data and if they agree to the terms and conditions I have specified on this form. ☐
6. I agree that the researchers can contact me again about further studies and workshops using the information I supply below. ☐
7. ***I agree to take part in the above study.*** ☐

Name of participant. Click or tap here to enter text.

Date (dd/mm/yy) Click or tap here to enter text.

Email address. Click or tap here to enter text.

Signature. Click or tap here to enter text.

Interview questions

SUPER-*G* Task 4.1c:

Review of existing policies and impacts

STAKEHOLDER EVALUATION INTERVIEW

Thank you for agreeing to take part in this interview! As mentioned, we are interested in your organization's views on the spectrum of UK Grassland Policies.

We understand that, although you have specific knowledge and expertise, you might have a limited overview of all the complex policies in existence. Therefore, we will provide you with an overview of "UK Grassland Policy" objectives and their impact as evaluated by official government sources. If you like, you may keep this document open and refer to it during the interview.

As you may know, permanent grasslands are important because of the ecosystem services they can provide such as food and fuel, their ability to regulate the climate and water, or their importance for recreation and cultural heritage. Polices often vary in their approaches and design to the promotion of ecosystem services and may target land managers or other groups through education, regulation or subsidies. Conflicts of interest inevitably exist, and policies can both help and hinder these differences in priorities. We are interested in better understanding

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the impacts of the current policy landscape in relation to the ecosystem services that grasslands can provide.

Interview Questions

1. (MAIN INTEREST OF ORGANISATION) What are the main interests your organisation represents with regards to ecosystem services and/or permanent grasslands?

2. (RELEVENCE) Are the objectives of UK "grassland policy" in line with the problems and interests your organisation represents? Please explain in general terms or with reference to specific policies.

3. (DEMOCRACY) How has your organisation been involved in influencing key decisions related to permanent grassland policy? Please provide examples on how (the) policy was influenced by or meets the needs of your stakeholders.

4. (LEGITIMACY) Do the individuals your organisation represents recognize the importance of permanent grasslands in providing the ecosystem services that matter to them? If so (or if they were made more aware) do they/ you support the policies currently in place? E.g. do the policies (e.g. outcomes of and processes and procedures of the policies and policy delivery) match their/ your expectations and work for their/ your benefit)? If not, how do they go about achieving their goals or influencing a change in policy? Please provide examples.

5. (EFFICIENCY) Are the costs associated with UK grassland policy (and/or a specific policy) justified by the benefits? Why do you believe this to be the case?

6. (IMPACT) Each policy that influences grassland management and ecosystem services makes claims about certain impacts. Are the claims being made accurate? What impacts have you seen? Please provide examples to specific policy claims.

7. (UNEXPECTED NEGATIVE CONSEQUENCES) Can you think of any negative, possibly unexpected consequences that arose (may arise) due to the policies (or specific policy) in place?

8. What changes would you like to see in UK grassland policy in light of the political changes ahead (e.g. in terms of objectives, indicators, stakeholder engagement, etc.), why, and what challenges do you see for these changes to happen?

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