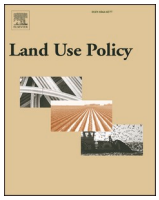
Land Use Policy 127 (2023) 106574

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol



Citizen perceptions and values associated with ecosystem services from European grassland landscapes

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ARTICLE INFO

Keywords:
Permanent grassland
Rural landscape
Citizen perception
Ecosystem services
Socio-cultural values

ABSTRACT

European permanent grasslands are multifunctional landscapes that deliver an important mix of ecosystem services. The effectiveness of future policies linked to landscape and agricultural practices requires consideration of citizen perceptions of, and priorities for, benefits (e.g. ecosystem services) demanded from permanent grasslands. This exploratory research aimed to expand understanding of citizens' perceptions and socio-cultural valuation of grassland landscapes, ecosystem service provision and management across Europe in order to inform future research. Fifteen focus groups with residents of rural areas, urban areas, and young adults from rural areas (aged 18–26) (N = 104), were conducted across five European countries (Spain, Sweden, UK, Switzerland and the Czech Republic) between 2020 and 2021. Overall, participants perceived grassland landscapes positively, describing connection to the landscape through experience, emotions, environmental characteristics, activity, access, and cultural identity. Prioritisation of ecosystem services from grassland varied between countries, influenced by grassland system diversity, and complex socio-cultural and socio-economic differences. Rural dwellers, including rural youth, perceived more benefits from grasslands than urban dwellers. Perceptions of problems were related to reduction, degradation and abandonment of grassland, and varied between urban and rural dwellers. Consumer education about the value of grasslands was perceived as vital in ensuring sustainable management and use of these landscapes. Citizens across different countries shared farming ideals relating to farming for biodiversity. These findings can help ensure that policies surrounding landscape and agricultural practices align with societal perspectives and priorities to effectively deliver multifunctional, valued, sustainable grassland systems.

1. Introduction

Grassland ecosystems are an important land use internationally, covering a third of the global land surface (Bengtsson et al., 2019; Egoh et al., 2016; Lemaire et al., 2011). In Europe, permanent grasslands (PG) cover 34% of the total agricultural area (Eurostat, 2020), and are defined as land used for five or more consecutive years to grow grass or herbaceous fodder, forage or energy purpose crops (EuroStat, 2019). PG are considered as multi-functional landscapes and deliver multiple ecosystem services (ES), including provisioning services (e.g. fodder production, human food production), regulating and maintenance services (e.g., habitat provision, erosion control, water flow regulation, carbon storage, maintenance of soil fertility), and cultural services (e.g., recreation, education, aesthetic value) (Bengtsson et al., 2019; Egoh et al., 2016). Recent research has focused on the supply of ES on permanent grasslands (Crouzat et al., 2015; Schirpke et al., 2016). However, the demand for the benefits provided from grasslands in relation to the socio-cultural valuation of ES has been understudied (Martín-López

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https://doi.org/10.1016/j.landusepol.2023.106574
Received 14 March 2022; Received in revised form 18 January 2023; Accepted 31 January 2023
Available online 14 February 2023

et al., 2019; Zhao et al., 2020). It is important to consider public perspectives about, and preferences for, ES delivered by landscapes if agri-environmental policy is to be societally acceptable (Seppelt et al., 2011). Previous polices relevant for grassland management have not fully considered demand for ES (Hunter et al., 2019). If more holistic landscape policies are to be implemented across Europe, there needs to be a more coherent and transparent process that allows citizens' interests to be reflected in policy making (Bas-Defossez et al., 2018).

Citizens' perspectives on ES and grassland landscapes have been studied through perceptions (i.e. the process by which people interpret and organize stimuli to produce a meaningful experience of the world (as defined by Lindsay and Norman, 1977)), and values (i.e. the importance people assign to phenomena from the perspective of their own well-being (e.g. see Zoderer et al. (2019) in reference to socio-cultural valuation of (bundles of) ES)). Attitudes related to grassland (i.e 'deeply held mental stances' that connect to preferences for, and perceptions of, land or landscape, as well as the way that people attach meaning and value to it (Swanwick, 2009))) are also studied, but have more often been studied in relation to farmers and farmer behaviours (e.g. Hammes et al., 2016). Studies use multiple terms to describe citizen's relation to landscape. In this study 'perspectives' will be used to encompass perceptions, values and, where appropriate, attitudes. Attitudes are more complexly associated with underlying personality, beliefs, values, behaviours, and motivations (Pickens, 2005), and as such a closer understanding of citizen's attitudes is outside the scope of this exploratory study.

In general, citizen's perspectives of grassland have been studied in the context of wider landscapes that include grassland elements (Konkoly-Gyuró, 2018; Pătru-Stupariu et al., 2016; Sottini et al., 2018; van Berkel and Verburg, 2014; Zoderer et al., 2016). Many studies have focused on mountain regions (Jaligot et al., 2019; Schmitt et al., 2021; Zoderer et al., 2019), or marginal or protected landscapes (Bernués et al., 2016; Kovács et al., 2015). Research has also focused on cultural ES delivery including recreation, landscape aesthetics and tourism (Howley, 2011; Howley et al., 2012; Junge et al., 2011, 2015; López-Santiago et al., 2014; Schirpke et al., 2016). Research has considered the quantitative, monetarised valuation of ES, including economic valuation (Richter et al., 2021), as well as willingness to pay (Bernués et al., 2014, 2016; Oteros-Rozas et al., 2014; Rodríguez-Ortega et al., 2016; Scholte et al., 2015; Villamor et al., 2014). Qualitative approaches to understanding socio-cultural valuation of grassland are less frequent (Fagerholm, 2016), and are usually included in mixed methods approaches (Bernués et al., 2014; Oteros-Rozas et al., 2014). Socio-cultural perspectives can acknowledge the pluralistic values that people hold towards ES (Scholte et al., 2015; Wegner and Pascual, 2011). Value pluralism recognises that different and potentially conflicting values are associated with each-other in potentially complex ways and are non-reducible to each other (Arias-Arévalo et al., 2018, 2017; Gómez-Baggethun and Martín-López, 2015; Jacobs et al., 2016; Kenter, 2016; Pascual et al., 2017). Pluralistic approaches recognise that values go beyond the intrinsic-instrumental dichotomy that has often dominated management approaches, to acknowledge the importance of relational values (as defined by Chan et al., 2016:1462 as "preferences, principles, and virtues associated with relationships, both interpersonal and as articulated by policies and social norms"). A pluralistic understanding of values is growing in scholarship (e.g. Arias-Arévalo et al., 2018; Chan et al., 2016; Jacobs et al., 2016; Jones et al., 2016; Kenter, 2016; Pascual et al., 2017), and is a critical research priority toward the sustainable management of ecosystems (Arias-Arévalo et al., 2017; IPBES, 2022). A pluralistic approach is called for in order to explore in more detail the complex relationships between ecosystem function, management, governance, human wellbeing and quality of life, as well as exploring the drivers of problems associated with these (Martin-Lopez et al., 2019).

Many studies of perceptions and values of grassland landscapes contrast citizen perspectives with those held by other stakeholders, including farmers (Bernués et al., 2014, 2016; Lamarque et al., 2011; López-Santiago et al., 2014; Schmitt et al., 2021). These highlight many potential conflicts in relation to prioritisation, and financial incentivisation of the production of certain ES through policy drivers. Socio-cultural approaches using qualitative methods to explore citizen perspectives have often focused on Alpine regions, e.g. Quétier et al. (2009) explored local descriptions of a mountain grassland area in the central French Alps in relation to socio-political discourses. Pachoud et al. (2020) assessed the perceptions of local stakeholders and tourists regarding summer farms (temporary units where cattle are moved during summer to graze on Alpine pastures) in Italian Alps. Research in other regions have focused on public perceptions of agricultural systems including grassland (e.g. agro-forestry systems in the Spanish dehesa grassland (the dehesa is a multifunctional, agrosylvopastoral system and cultural landscape of southern and central Spain (Gaspar et al., 2016)). Schmitt et al. (2022) focused on plural valuation of grassland areas in Bavaria, Germany, using qualitative and quantitative methods to consider the spatial distribution of intrinsic, instrumental and relational values of grassland. They highlighted the significance of trade-offs between instrumentally valued grassland suitable for provisioning services, and intrinsically valued grasslands that are closely associated with relational values of care, as well as identifying synergies between different value judgements. The results have consequences for informing practical insights for prioritization of certain grassland management practices. Schmitt et al. (2022) demonstrated the importance of pluralistic valuation approaches to provide vital information for land use prioritisation and management advice.

Multiple factors have been found to affect people's perception of ES in grassland landscapes, including age, gender and education, as well as rural/ urban residency (Martín-López et al., 2012; Orenstein and Groner, 2014), and environmental interest (Schmitt et al., 2021). Social preferences for specific ES and ES bundles have been shown to vary across rural-urban gradients due to a complex set of factors including cultural traditions, individual needs, access to ES, and sources of household income (Martín-López et al., 2012). Such factors underpin different worldviews and different connections to ecosystem services. Rural populations have been shown to perceive more diversified ES due to a closer connection to their own wellbeing, and urban populations less perception of ES essential to life due to a disconnection between human well-being and life-supporting environments. Thus perceiving more value in ES associated with external factors such as recreation and aesthetics (Martín-López et al., 2012). Recent research has found that hotspots of multifunctionality in peri-urban grassland landscapes occur where rural/ urban preferences overlap (Filyushkina et al., 2022). It is therefore important to understand the differences and similarities in urban/ rural perceptions of ES (and the values and preferences that may be related to perceptions) associated with grassland to better align policy and management efforts for landscape governance that can deliver multiple benefits.

Age has been shown to affect preferences for ES associated with lifestyle and education (e.g. Schirpke et al., 2016). Young rural residents are a stakeholder group key to the preservation of sustainable rural areas (Council of Europe, 2022), but can be vulnerable to poverty and/or disadvantage (European Commission, 2008). Aging populations (UNECE, 2017) and a structural decline in employment in agricultural industries in many areas of Europe lead to higher rates of out-migration of young people from rural areas, which has become a concern in relation to maintaining economic growth and equality of opportunity in rural areas, as well as cultural ES (Augère-Granier, 2017; Pellaton et al., 2022). Recent policy within the EU (e.g. European Union Youth Strategy (2019–2027)), has emphasised the importance of youth engagement in the development of rural areas and the interconnected wellbeing of urban and rural people (European Union, 2022). The perceptions and values of rural youth are important to explore in light of goals focused on the sustainability of rural areas, and the need to engage rural youth in developing sustainable grassland systems and policies. Studying the

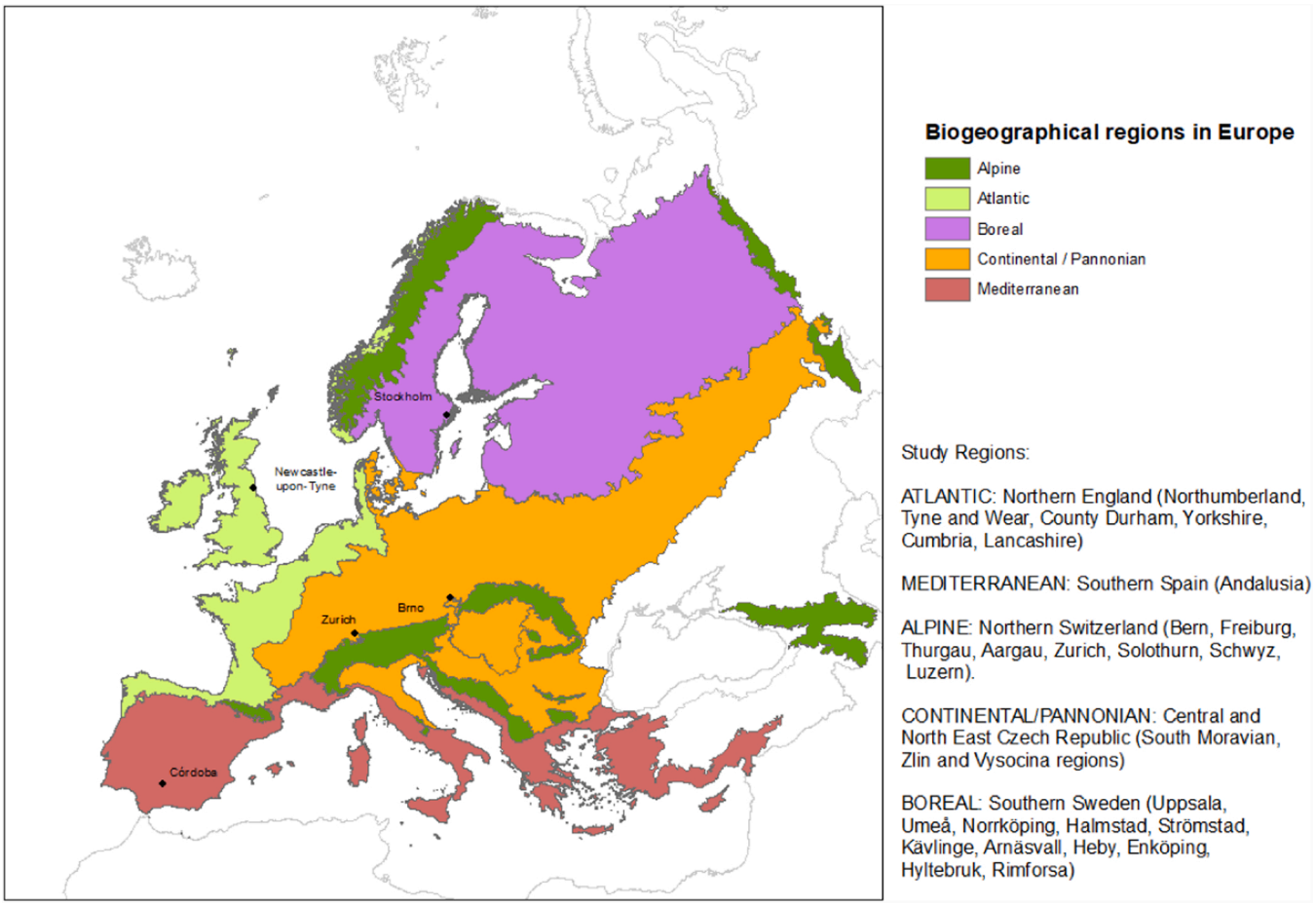

Fig. 1. Map of biogeographical regions (BGRs) of Europe included in the study and case study regions.

perceptions and values of citizens in rural and urban areas, as well as younger rural residents, gives important insights into the variety of understanding and interpretations of the impacts of land management and governance. It also give insight into the level of social acceptability of environmental policy and decision-making across different contexts (Bennett, 2016).

This study aims to expand understanding of the perspectives (including perceptions and values) of citizens about grassland landscapes, ESs provision and management across Europe, between urban, rural, and rural youth populations, using a qualitative approach.

2. Materials and methods

2.1. Study locations

The research took place in five case study countries: Spain, UK, Sweden, Switzerland and Czech Republic, representing five biogeographic regions in Europe (Fig. 1). Case study areas represented regions within each country containing a mix of grassland landscapes and incorporating urban centres. This regional scale was chosen in order that participants had a shared geographical frame of reference, and to enable comparison of the perceptions of rural and urban dwellers. The case study areas (see Fig. 1) are characterised as follows:

- The Spanish case study area, dehesa, is considered as a forest transformed into a land-use and management system based on the exploitation, mainly for livestock and also forestry, hunting and agriculture, of an area of grassland and Mediterranean scrub with scattered presence of arboreal vegetation.
- The UK study region spans several counties in Northern England and is characterised by grazing livestock and mixed farming systems in lowland and upland areas, and some arable systems on the eastern plain. Livestock grazing farms in lowland areas are typified by improved and semi-improved grasslands, while upland areas, including the Lake District and North Pennines, have extensive areas of moorland used for rough grazing and some limited areas of species-rich grassland.
- The Swedish case study covers three boreal regions including the Boreal-Nemoral in the south dominated by arable farms, and the Southern Boreal region and Boreal region where the majority of semi-permanent grasslands are situated and boreal forests fill the landscape in relatively sparsely populated areas—most often adjacent to farms and close to the (west) coast (see Hunter et al., 2020).
- The Czech study region is botanically rich and diverse. It covered a wide variety of biotopes and species (such as herb-rich meadows of White Carpathians or undulating cultivated steppe of Bohemian-Moravian Highlands) with low hills and valleys and a wealth of woods and groves. The original virgin forest was transformed into cultural landscapes with the co-existence of nature protection interests and economic land use.
- The Swiss case study region, the Swiss Plateau, has an area share of about 30%. It is one of the three mountainous regions of Switzerland, along with the Jura and the Alps. It comprises the partly flat but largely hilly area between the Jura and the Alps and lies on average at an altitude of 400–600 m above sea level. Favoured by its basin location, it is by far the most densely populated region in the country. Grasslands in the area include extensive pasture/meadow, intensive

Table 1
Focus group (FG) participants.

	Urban FGs	Rural FGs	Rural youth FGs	*Total*
Participants (n)	35	34	35	*104*
Female (n)	20	17	19	*56*
Male (n)	15	17	16	*48*
Age range	19–69 +	21–70 +	18–26	*18–70 +*
18–25	5	4	34	*42*
26–34	6	6	1	*13*
35–44	7	7	0	*13*
45–54	10	6	0	*16*
55–64	5	8	0	*13*
65–74	2	3	0	*5*
Highest educational level				
Primary	0	1	1	2
Upper secondary	3	8	8	19
Tertiary undergraduate	13	12	6	31
Tertiary postgraduate	8	1	9	18

pasture/meadow (grazed by animals) and intensive/extensive grassland (cut and not grazed by animals).

2.2. Focus group participants

Fifteen focus groups with citizens were conducted across five countries. The focus groups aimed to explore the variety of perceptions, opinions and attitudes of a purposive sample of citizens, highlighting contrasting views (Yin, 2009), as well as examining the joint construction of meaning (Bryman, 2016). Three focus groups were held in each country with residents of rural areas, residents of urban areas, and young adults from rural areas, aged between 18 and 26. These groups were chosen to contrast the views of people who may differ in their knowledge and experience of grasslands, potentially contrasting everyday experiences of living and working in the countryside (more likely linked to rural dwelling), with visiting for specific purposes (more likely linked to urban dwelling). Younger rural residents were a focus due to their importance for rural sustainability, and the risks associated with out-migration from rural areas (UNECE, 2017). The 18–26 participants in the mixed rural groups were evaluated as part of a mixed-age perspective due to the small numbers and collective influence of discussion in mixed groups.

A variety of recruitment strategies were employed, including using an external recruitment company for rural and urban residents (UK, Switzerland), and a combination of social media, email, and word of mouth (Sweden, Czech Republic and Spain). The focus groups contained a mix of gender, age and educational level. Sessions lasted between 1 and 2 h and were conducted between June 2020 and January 2021. The focus groups were conducted online using video conferencing tools due to COVID-19-related restrictions on travel and face-to-face meetings in all case study countries at the time of data collection. This enabled participation from across a wider geographical region, and the utilisation of additional online functionality to aid facilitation of discussion. Each focus group was conducted in the language native to the location, recorded, transcribed and subsequently translated into English in order to enable standardised analysis. A total of 104 participants took part in focus groups (Table 1).

2.3. Focus group content

Focus groups protocols and prompts (translated and back translated) were used to guide discussion around the values, opinions, and preferences of participants, covering topics such as: visits to the countryside and activities undertaken when visiting; likes and dislikes associated with grassland landscapes: benefits of grasslands; perceptions of problems in the countryside; perceptions of management approaches and opinions about who has responsibility for grassland landscapes; as well as views on food labels from sustainably farmed products from grassland (Table A.1). Each focus group used the same protocol, but facilitators allowed participants to lead the order and focus of the session.

Initially, participants were asked to talk about their experiences of visiting the “countryside”. Subsequently the facilitators introduced discussion on grassland landscapes, using a short description and photographs of different types of grassland relevant to each country (see supplementary material 1). These images depicted examples of grassland in different farming systems to prompt memories, feelings, emotions and opinions about all types of “grassland”. As focus groups were conducted in local languages, different terms were used to refer to grassland within the local context. All countries also used terms referring to grassland in general, as participants were unlikely to be able to easily distinguish PG from other types of grassland, including temporary grassland. Whilst most questions focused on perceptions of grassland, participants also answered with reference to the wider landscape or countryside.

During discussions about the benefits of grasslands, participants were first asked an open question about benefits provided by grasslands, where they provided answers without prompting. Subsequently, an image was shared depicting simple symbols representing a variety of different ES delivered by grassland (including provisioning, regulating, supporting and cultural). For practical reasons, only the term ‘benefits’ was used with participants to avoid confusion, as the term ‘ecosystem services’ is not often familiar to those outside of academia.

2.4. Analysis of focus group content

The translated transcripts were uploaded into qualitative data analysis software, NVivo 12 Pro (QSR International Pty Ltd, 2018) and coded thematically based on the key topics covered in the focus groups. Open coding of each transcript was applied to identify cross-cutting themes (Flick, 1998; Strauss, 1987.). Coding was completed when no new themes emerged (Esterberg, 2002). Benefits and problems with grassland landscapes were interpreted using an ecosystem services typology (adapted from the Common International Classification of Ecosystem Services (CICES, 2021)). Not all statements made by the participants could be directly classified within this ES typology, as participants often described features that underpin multiple ES (e.g. biodiversity, which plays a variable role in the provision of ES (Mace et al., 2012; TEEB, 2011)). Classifications were made based on the key functions of grassland and link to grassland features as mentioned by the participants. The concept of ES disservices (defined as “the ecosystem generated functions, processes and attributes that result in perceived or actual negative impacts on human wellbeing” (Shackleton et al., 2016: 590) was used to capture the adverse impacts of loss or change to grasslands as described by participants. The concept of ES disservices is not included in current ES classifications such as CICES (Haines-Young and Potschin, 2018), but recent studies have called for the need for ecosystem disservices and ES to be considered equally to improve understanding of people’s views and actions in relation to ecosystems (Blanco et al., 2019a; Guo et al., 2022). Therefore, this study used an adapted approach to ES classification in order to incorporate disservices. The relative importance of themes was analysed based on the proportional number of phrases coded to each theme. Ten percent of the sample coded were cross checked by an additional coder to ensure consistency.

3. Results

3.1. Experiences of grasslands landscapes

When describing and discussing grassland landscapes, focus group participants discussed six key themes (Table 2), which represented elements of grassland perceived as relevant or significant for participants, and those which participants preferred or liked. The landscape qualities

Table 2
Themes associated with experiences and descriptions of grassland, with example quotes from participants. (Participant references include an identifying number, country, and focus group type.).

Theme	*Topic*	*Example quote (s)*
Landscape quality	*Extrinsic qualities* (e.g. *varied, diversity, biodiversity, meadow flowers, beauty, fresh air)*	• *"[In grassland] I can actually enjoy those scents and I like meadow flowers, and I like to observe the life around me, moreover it's passable (accessible) and the views are better." (W7, Czech Republic, Urban)*
	Intrinsic qualities (e.g. *natural, nature, balance)*	• *"I love going to the countryside and visiting, above all, landscapes such as the dehesa, where you can see the breadth and balance of nature, animals, plants, and all the members of this ecosystem." (F1, Spain, Urban)*
Emotions, feelings and memories	*Positive feelings* (e.g. *relaxation, happiness, calm, freedom)*	• *"In spring, a diverse blooming meadow is a feeling of freedom for me." (F1, Switzerland, Rural Youth)*
	Home	• *"So for me, the meadow means home, because there were meadows around us, around my house, there are rarely forests in Pálava, […] I appreciate [meadows] more in the landscape, which is flatter, clearer,…. […] I like it very much." (W3, Czech Republic, Urban)*
	Sadness at loss of grassland	• *"The 5th [photograph] already, for me, is the biggest sorrow because those trees that you see there, are the ones that [show] that in their time that was a dehesa. It's a shame, but well, in those times there [was a need] to make farmland, which led to this disappearance. The truth is that it makes me sad." (M1, Spain, Rural)*
Cultural connection	*Rural past and heritage*	• *"I really like to walk or go hiking and I really like it when some cows, sheep graze in those meadows or pastures, it evokes the feeling of such a typical Czech landscape." (W5, Czech Rep, Urban)*
		• *"I believe that in Spain and Andalusia [the dehesa] forms part of our natural heritage." (M4, Spain, Urban)*
	Love for landscape	• *"Truth is that I have been in love with the dehesa since I was a child" (F3, Spain, Rural)*
Livestock, animals and wildlife	*Presence of livestock*	• *"I love animals grazing. The most natural thing for animals is to be outside as much as possible. I like pastures." (P4, Sweden, Rural)*
		• *"When you go to the dehesa, in a search of landscape, you go in search of animals; and it is one of the main attractions of the dehesa landscape. And then, in terms of the management and stability of the "dehesa" as a system" (M3, Spain, Rural Youth)*
	Connection to animals	• *"Meadows are also extremely important to create a connection between people and grazing animals. Without grasslands, there would be no cows in the meadows, and then most people would never see a cow, and I think just for the awareness of where our meat or milk comes from, it's very important that there's an encounter there with people, and not just between producers and animals. That everyone has the opportunity to walk up to a cow." (F4, Switzerland, Rural Youth)*
	Negative associations	• *"I will certainly be avoiding the livestock anyway. [I] wouldn't want to trespass and wouldn't want to get too close to them anyway." (F3, UK, Rural)*
Farming and agriculture	*Agricultural grassland*	• *"I prefer high grasslands in the mountains over the artificial meadows in the midlands, it's not really nature, it's more agriculture." (M1, Switzerland, Rural youth)*
	Productivity	• *"[I prefer] whichever of the pictures [of grassland] reflect a living countryside, both animal production and harvest" (P5, Sweden, Rural Youth)*
		• *"I grew up in the countryside as well. Like most of the others, I enjoy the farming aspect of [grassland], and livestock in particular." (M2, UK, Rural Youth)*
Comparisons with other land areas	*Comparison to forests*	• *"We prefer to visit the forest, that is actually number one" (P2, Sweden, Urban)*
		• *"The landscape I like is a type a bit close to the mountains; colder than elsewhere in the country, fewer fields, more forests.[…] I like that (apart from some complete extremes) you can escape into it in the heat and calm down, disappear into the forests" (M6, Czech Rep, Rural Youth)*
	Comparison to mountains	• *"The way [grassland] is in the mountains, I personally like best. What I like less is the way the grass is kept here in the lowlands, everything is green, lots of clover, almost no biodiversity in the meadows. This is much too useful and not beautiful enough." (F1, Switzerland, Rural)*
	Accessibility compared to other areas	• *"Thinking of accessibility, then I prefer meadows because croplands and cultivated land is probably off limit." (P3, Sweden, Urban)*
		• *"The Lower Engadin is the most beautiful place for me, where you can move freely and walk a little on the meadow without getting into conflict" (M2, Switzerland, Rural)*
		• *"It wouldn't matter so much to me if it was a field, or it was a forest. As long as it's still usable for the general public to walk through. Or, explore." (F2, UK, Urban)*

of grassland were often framed positively, and participants referred to extrinsic qualities including visual elements such as meadow flowers, views, colours and lack of buildings and people. Participants also referred to positive experiential qualities including openness, space, fresh air, wilderness, (pleasant) smells, biodiversity, beauty and aesthetics. Participants' showed preferences for intrinsic qualities of grassland landscapes, such as nature or natural aspects; a living landscape. They saw grassland as multifunctional; balanced; and part of an ecosystem. Grasslands themselves were also seen as offering balance in the landscape, and many participants shared a preference for diverse, balanced and heterogeneous landscape in general. The diversity of grassland types was valued.

Predominantly positive emotions and feeling were expressed in association with spending time in grasslands, including: "peace", "calm", "happiness", "escape", "pleasantness", "safety", "freedom" and "relaxation". Negative emotions were associated with the loss or degradation of the landscape. Participants expressed preferences for particular landscape types related to familiarity from childhood or a place where they "grew up". A number of participants (n = 15) expressed a cultural connection to grassland landscapes through links to national identity and typical national landscapes, or to a rural past and heritage. Some participants (n = 11) used emotive language around love and pride for the landscape, linked to the cultural value of the landscape, particularly in reference to specific types of grassland (e.g. the silvo-pastoral system in Southern Spain - dehesa).

Participants mentioned the presence of livestock as a significant defining characteristic of grasslands. Some participants (n = 27) had positive feelings associated with seeing and being close to livestock, and grassland as a home for livestock. Although there were more positive comments associated with livestock than negative, some participants (n = 5) expressed fears in relation to getting close to livestock. Some participants mentioned the importance of the presence of livestock for creating a feeling of completeness or true identity in the landscape. The visibility of livestock to wider society was seen to help increase social connection to food production. Some participants (n = 17) described enjoyment when experiencing the presence of wildlife, including insects

Table 3
Summary of perceptions relating to experiences of grassland landscapes in the five case study countries.

Country	Summary of perceptions of grassland landscapes
Spain	• Strong emphasis on the special cultural value of the dehesa linked to cultural heritage and ancestry, as well as traditional practices • Love and passion for the landscape • Strong value for livestock and productivity • The dehesa was seen as distinct from the general countryside
UK	• Emphasis on beauty, fresh air, openness and space • Grasslands were valued for their accessibility and for opportunity for recreation • Grassland landscapes facilitated feelings of relaxation and enjoyment • Wildlife watching, walking and exploring were important activities
Sweden	• Grassland was perceived to provide variety in the landscape – people preferred diverse landscapes. • Grazing was seen as good for a "healthy countryside" • Comparisons were made to forest landscapes, which feature heavily in people's recreation and were liked for that reason • Grasslands were valued for the chance to explore nature, for their beauty and relaxation • People valued the meadow flowers and bees
Czech Republic	• Meadows and pastures were frequently perceived as beautiful, green, peaceful, quiet and clean • Some people expressed pride in the landscape and local identity • Comparisons were made between grassland landscapes in Czech Republic, and alpine grassland, as well as forest land, which was valued for its familiarity and proximity
Switzerland	• Emphasis on the wilderness, freshness, beauty and flowers in alpine grasslands • Alpine grasslands were often preferred over lowland, or 'artificial' meadows • Alpine grasslands were seen to provide freedom from agricultural landscapes • More diverse grasslands were preferred

such as bees and butterflies, as well as birds in grassland environments.

Associations between farming, agriculture and production and grassland depended on the type of grassland and perspective of each individual and country. In some countries participants associated mountain grassland with "natural" grassland, in contrast to more agricultural grassland, which was associated with lowland areas. Mountain grassland was often preferred for its beauty and diversity. However, some participants valued the agricultural systems that produce grassland landscape, whilst recognising their semi-natural characteristics. Productivity of grassland was also mentioned as an important value.

In areas where forests are a prevalent land use (Sweden and the Czech Republic) some participants showed a preference for spending time in forests. For example, in the Czech Republic this preference for forests was linked to childhood memories of "deep forests" (M6) in mountainous areas, in contrast to a lack of forests in more intensive agricultural areas (e.g. South Moravia). Forests were also linked to recreation and leisure in Czech Republic as activities are possible in every season (meadows and pastures become "inaccessible" in summer due to tall grass, grazing animals). Others stated that they preferred to visit the mountains, for the views, adventure or wilderness (e.g. in Switzerland). In some cases, participants expressed indifference as to whether land should be used for grassland or forest, and primarily valued the ability to access the land for general benefits from the countryside (e.g. in UK). Ease of access of grasslands was valued by a number of participants, particularly in comparison to croplands or (other) agricultural land.

The impression and identity of grassland landscapes varied across the five nations represented in this study (Table 3). These differences reflect the distinct cultures shaping grassland landscapes and their use and value in each country.

3.2. Benefits of grasslands (ES priorities)

Using the Common International Classification of Ecosystem Services (CICES) to code participants' responses, 14 ES within three categories (cultural, provisioning, and regulation and maintenance) were mentioned when participants were prompted to discuss benefits. Fig. 2 represents the connections participants made between the benefits and values of grassland (e.g. wildlife is supported, physical health, food production etc.) and the biophysical structures of the landscape and physical functions and ecosystem characteristics (e.g. grass, open landscape, views, meadow flowers, water retention etc.). Fig. 2 demonstrates how these connections can be analysed through the lens of ES. There is an interconnectivity and plurality of ES provision, where citizens' discourse on ecosystem features underpins multiple ES, which can be connected to multiple perceived benefits discussed by citizens. The ES labels did not always easily encompass the sentiments of participants' comments, and boundaries should be seen as fluid between categories, as well as between ecosystem features, and benefits and values. Despite difficulties categorising some comments, participants' opinions on the benefits of grassland could most often be categorised as ES associated with providing habitats for wild plants and animals (Fig. 2), followed by cultural ES of sport, recreation and leisure. Many benefits could also be associated with provisioning ES, particularly in relation to the supply of food from grassland, and support for livestock. Other benefits were linked to aspects of regulating and maintenance ES. These were less often described, perhaps due to their lack of visibility. Cultural ES, other than leisure and recreation, were mentioned less frequently but could be categorised within several cultural ES labels. This represents the difficulty in untangling the plural value that participants held, and the fluidity of the cultural ES categories (as defined by CICES). Participants talked about the importance of the benefits and values, both for society in general and personally (see Table 4). Often participants listed many benefits, with some stating that a combination of benefits was of significant value.

Urban focus group participants mentioned the provisioning services of livestock systems in relation to food supply the most, and more often referred to biodiversity and support for wildlife, and recreation and leisure compared to the other focus group types (see Table B.1). Participants in rural and rural youth focus groups discussed a higher variety of benefits in general. There were also some differences in the benefits described by participants across countries (see Table B.2). In Spain and Sweden the most frequently described benefits were associated with livestock and the supply of food, and production value of the land. In Spain the provision of a home for livestock and the benefits of livestock rearing were significant, linked to the unique habitat of dehesa grassland for specialist livestock. In Switzerland and the Czech Republic, the most frequently named benefit was the provision of habitats for wild plants and animals. In the UK, the benefits were frequently associated with recreation and leisure. Such differences reflect the different experiences and preferences of participants in each country (see Table 4), and are likely to reflect the different cultural connections each country has with grassland, as well as the environmental characteristics of the regional grassland for each country.

3.3. Problems and threats to grassland

Problems and threats to grassland described by participants were classified into three themes: i) conversion of grassland to urban land use or cropland, or reduction of access to grassland; ii) degradation of grassland; and iii) abandonment of grassland (lack of management). Participants described the negative consequences of such problems and threats, often holding up valuable aspects of grassland systems that would be lost (or have been lost) should the threats and problems arise (or had already arisen in certain areas). These were classified into ES categories (Fig. 3), also acknowledging the limitations of ES categories for capturing the diversity of values described. Many participants were

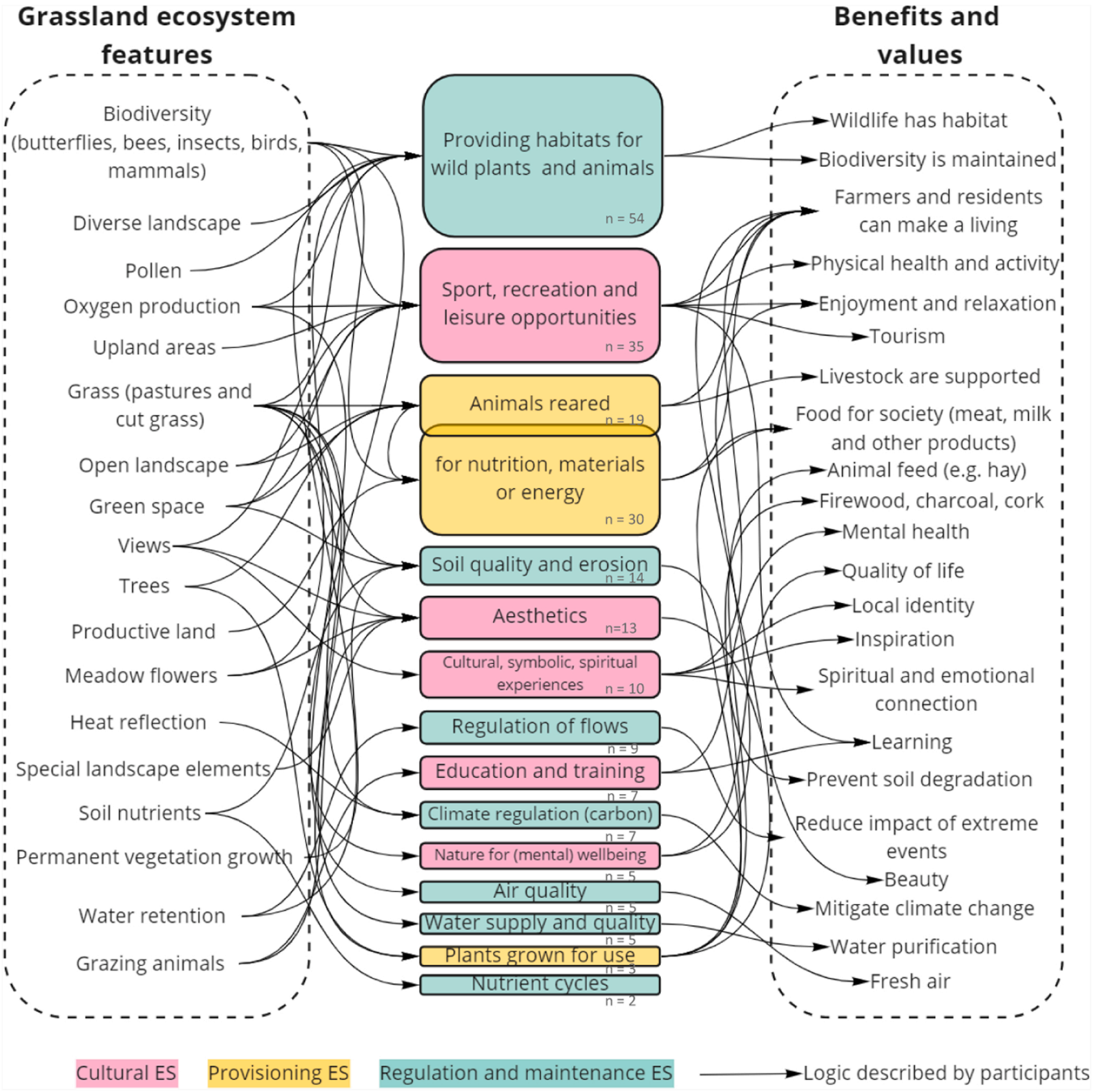

Fig. 2. Benefits of grassland as stated by participants (of all focus groups) interpreted though the ES framework (size of box equivalent to relative number of coded references within focus group transcripts (n) – size not exactly proportional). Black arrows refer to connections and logic described by participants.

concerned that biodiversity (because of habitat loss) would be lost if there was degradation of the land or conversion of the land away from grassland. Biodiversity was mentioned by participants in all five case study areas (see Fig. 3) and reflects the perceived importance of grassland for habitat provision and the need for grassland to be present and well managed to provide valuable biodiversity. Participants also discussed the negative effects of problems and threats (disservices) that would arise (or had arisen) in grassland areas, which were also classified as part of data analysis in ES categories (Fig. 3) as best as possible, given the connections already described (see Fig. 2). Participants also described the drivers of the problems and threats to grassland, shown on Fig. 3, connecting to specific problems and threats. Some drivers were described as resultant from wider, overarching drivers, which were different in different biogeographic regions. For example, the threat of the loss of grassland through conversion into cropland was described by a number of participants as being driven by a lack of profitability (of grassland) in all five case study countries (see Fig. 3). However, in Spain (SP) this lack of profitability was described as driven by changing prices and markets alongside drought, whereas in the United Kingdom (UK) participants attributed it to competition from powerful supermarkets and competitive imports. Fig. 3 therefore demonstrates the different perceptions people described of the wider economic, political and food systems associated with grassland across the different case study areas. Fig. 3 also shows the variation is risks to ES and risk of disservices across case study countries.

Conversion of grassland (to urban land use or cropland) was the most frequently discussed problem. Concerns related to conversion of grassland to urban land use (both residential and industrial). Narratives of

Table 4
Ecosystem services and benefits of grassland mentioned by participants, with example quotes.

Ecosystem service category	Example benefits and values from participants	Example quotes from participants
1. Habitats for wild plants and animals	Wildlife is supported	• *"[Grasslands are] a source of food for bees, which collect pollen from flowers there, it also serves as food for animals, which can also hide their young there." (M4, Czech Republic, Rural)* • *"In the dehesa you can also enjoy certain species that are only seen in the dehesa at certain times of the year. […] The cranes come to the dehesa every year in winter. In other areas or landscapes it is very difficult to see them." (Female 4, Spain, Rural Youth)*
	Biodiversity is maintained	• *"I think that [grassland] is especially important for the diversification and diversity of those animal and plant species. That, I think, is the most important thing." (W3, Czech Republic, Urban)*
2. Sport, leisure and recreation	Physical health and activity	• *"These areas [of grassland] make you more active, nature makes us more active." (P1, Sweden, Urban)*
	Enjoyment and relaxation	• *"People have more fun when they go picnicking on the green meadow and watch the cow graze. That's a recreational added value that you also get from the grasslands, because you can look there, which is of course also nice if you have a nice view" (F2, Switzerland, Rural)*
	Tourism	• *"It's quite nice to have natural meadows [,] and you have the bonds between recreational visitors [,] like campers [,] [which] brings in revenue to certain regions so that they can actually put more money into the landscape" (M1, UK, Rural)*
3. Livestock rearing	Food production	• *"I think it's very important that these lands exist in many different places so you can have local production. These dairy cows can contribute with local milk, local meat . That is important for me" (P1, Sweden, Rural Youth)*
	Productive systems for livelihoods	• *"The breeding and rearing of animals would be very important because the creation of employment has an impact on everyone" (M1, Spain, Rural Youth)*
	Support for livestock	• *"When the meadow is mown and the hay dries, it is a tasty animal feed. Pastures have their function in the name, they are important for animals that can graze here and are satisfied in nature." (W7, Czech Republic, Rural Youth)*
4. Cultural, symbolic and spiritual experiences.	Emotional connections, religious experiences, local identity and inspiration	• *"I still have a little bit of a bond with the religious, with the elements, so the green meadows and green pastures are still a distinctive part of my life," (M2, Switzerland, Urban)* • *"I also think that (the dehesa's) social character has a lot of weight" (F1, Spain, Rural Youth)*
	Nature for wellbeing, including mental health benefits and quality of life	• *"I also find important the psychological; the recovery; the separation of cities and the natural; that this really has an effect on the quality of life" (M2, Switzerland, Urban)* • *"Some of the students who have suffered from mental health issues, take them on trips to the countryside, do outdoor education, that is the benefit of grasslands". (M1, UK, Urban)*
5. Regulation and maintenance	Climate change mitigation	• *"So when I think of a ley – [I] think wow, here's a lot of growth going on, soil sequestering a lot of carbon. So I have a bit of a climate anxiety". (P4, Sweden, Rural)*
6. Multifunctionality	Regulating services underpin other benefits	• *"I also believe that biodiversity and soil protection are most important because without these two things we have neither food nor the possibility to use it for leisure." (F4, Switzerland, Rural)* • *"It's a bit like choosing a favourite child because everything is important. […] if you can design the landscape in a meaningful way, that it is useful for humans from the point of view of food and does good for biodiversity, if it is also beautiful, but that follows automatically." (F1, Switzerland, Rural)*
	Multiple benefits	• *"I believe that multifunctionality is what characterises this ecosystem (dehesa) and what we all value" (M3, Spain, Rural Youth)* • *"It's the whole that contributes with a lot of benefits, when you talk about pastures. When you separate the parts, you lose a lot of the benefits." (P5, Sweden, Rural)*

personal loss were used to express sadness at past loss and potential future loss of grassland (Table 5). Drivers of conversion of grassland were seen to be associated with financial pressures on farmers to sell their land to developers, as well as the political will to build houses and a demand for affordable housing. Cropland was seen to produce less benefits than grassland, particularly in relation to biodiversity, and aesthetic value. Drivers of conversion to crops were associated with a lack of profitability of grassland. Some participants also expressed concerns that access to grasslands by the public may be lost in the future, driven by land ownership change and closure of access roads.

Degradation was often seen to be driven by bad behaviour of visitors to grassland, e.g. in relation to littering and anti-social behaviour (see Table 5). Many people drew on their own experiences of seeing bad behaviour and held the view that the public should have responsibility for looking after the environment. The trade-off between encouraging more accessibility of grassland areas with the potential for damage and degradation and the importance of maintaining a balance was discussed. Degradation was also related to overexploitation of the land, and particularly overgrazing, and poor management and use of chemical fertilisers and machinery. These were problems most often associated with ecosystem disservices. The disservices were sometimes complexly interlinked across ES categories, for example in the Czech Republic, respondents mentioned artificial fertilizers (even though they are currently used very little on PG), which they associated with regulating and maintenance disservices such as soil degradation. They also associated this with the threat of having to use PG more intensively as was the case in the past (socialist agriculture), which is more closely linked to socio-cultural experiences and perceptions of agricultural and its function for society. Overgrazing and poor management were mainly discussed in Spain and the Czech Republic. Drivers included a lack of knowledge and training amongst landowners about appropriate management practices, issues with subsidies and policy, as well as a lack of profitability of the land. Some participants discussed the trade-off between profitability and conservation, implying that an imbalance between the two was a cause of degradation. Lack of profitability was a consistent driver mentioned by participants, including in relation to policy and financial instability, illustrating the connection made by participants between grassland and the economic viability of land management.

The threat of abandonment of grassland was described as an issue in most countries apart from the UK. It was linked to a lack of management of the land leading to, in some cases, overgrowing of vegetation. Negative feelings and consequences were associated with abandonment, as it was seen as representing loss of benefits, rather than a gain (Table 5). Drivers of abandonment of land were linked mainly to lack of profitability of land, lack of market for the products from grassland, and lack of policy incentives to maintain grassland. Low profitability and unclear policy were seen to lead to alternative land uses and poor land management.

Urban focus groups were concerned about conversion of grassland to

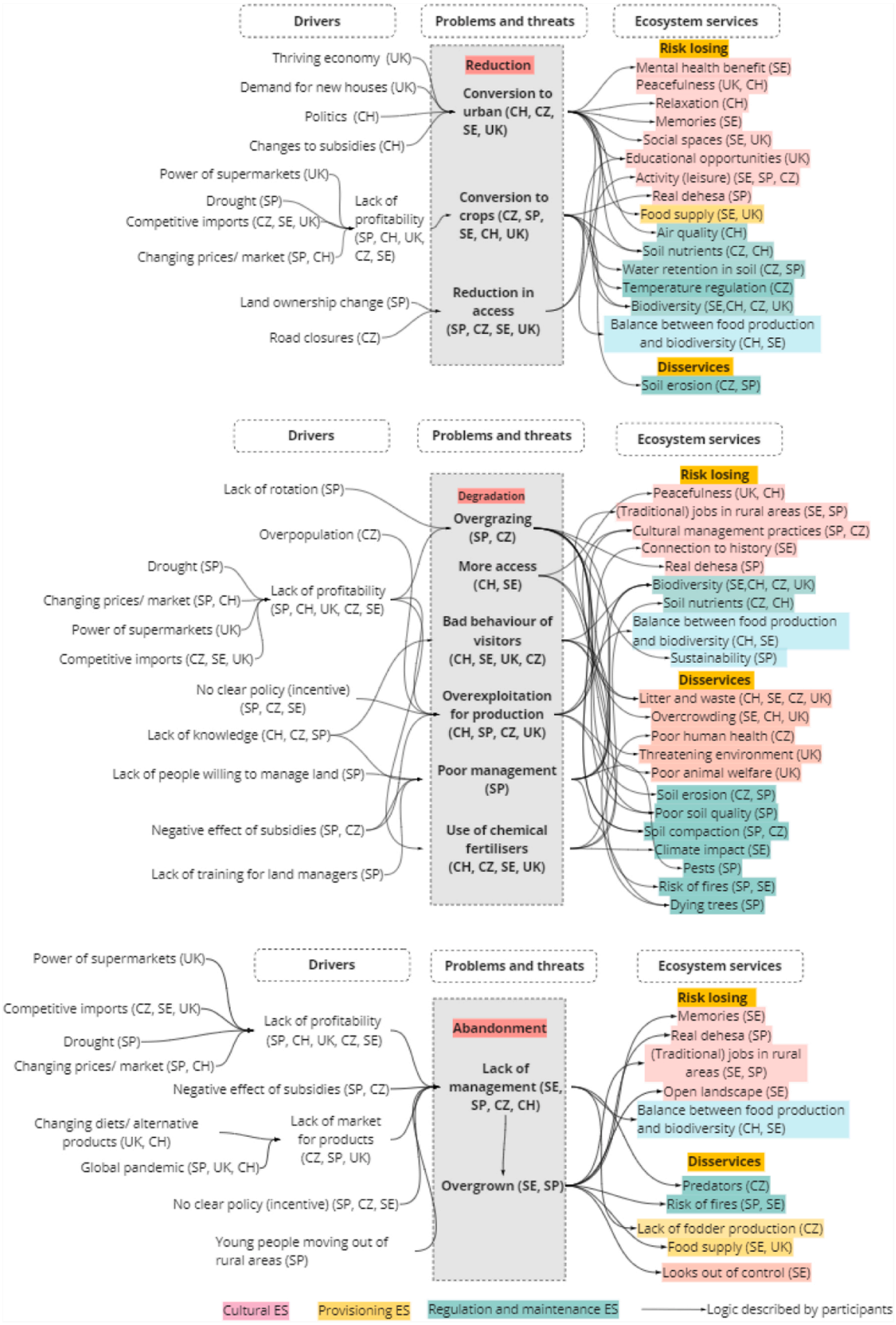

Fig. 3. Perceived problems and threats to grassland landscapes, including links to drivers and to ecosystem services lost. Arrows represent logic described by participants. Presence of theme by country is indicated with country codes in brackets (CH= Switzerland, SP=Spain, UK=UK, CZ= Czech Republic, SE=Sweden).

Table 5
Problems with grassland identified by citizens, with example quotes.

Problem theme	Problem or driver	Example quotes
1. Reduction	Conversion to urban land use	• *"Well, where I live these areas are being built on. I live in the outskirts of Norrköping and this area has grown very fast in recent years. […] It's very sad that there are almost no green areas left, apart from some parks in the city. There are so many new buildings and it's very sad." (P2, Sweden, Urban)* • *"I think I would feel robbed if a lot of the landscapes started to change […] we've got some absolutely gorgeous countryside around us and [with] talks of the open cast mining, […] to lose that landscape, because it would be gone forever, will be criminal. You know, really would be criminal." (M2, UK, Rural)*
2. Degradation	Bad behaviour of visitors	• *"Like when I see that people have played with fire, burning the picnic table or they've barbequed, just leaving everything behind when they're done. People don't clean up after themselves and take care of nature as they should" (P5, Sweden, Urban)*
	More accessibility	• *"I would love [to] welcome more accessibility. It's just, it's the balance between having it right and then not damaging, and not having loads of people foot pathing through, causing disturbance." (M1, UK, Rural)*
	Conflict between productivity and conservation	• *"You also notice the conflict, because food production has to be economical somehow, but people want more biodiversity because it's nicer" (F3, Switzerland, Rural Youth)* • *"With regard to repopulation [of trees in dehesa pastures], the farmer, the producer, the owner, would like to do it, but, profitability is profitability and, this is not always in harmony with the function of conservation." (Male 1, Spain, Urban)*
	Buying power of supermarkets	• *"I don't believe there's any restrictions in place to sort of limit the big supermarkets buying power. That's probably the cause of some of the problem, because we have a little farm shop down the road from here […]. And all of the stuff is fresh. It's all really nice, but it's probably twice the price of ALDI or LIDL or TESCOS. Because they can afford to do it cheaper. So it makes the competition totally unfair I think for those small providers." (M3, UK, Rural)*
3. Abandonment	Negative effect of loss	• *"During the 1700 my family moved there, and fought hard to open the landscapes, that in just a few decades have been overgrown again. Hundreds of years of work disappears in a few decades. It's tragic." (P5, Sweden, Rural)*
	Lack of profitability	• *"[Farmers] were already having problems getting their products out, and if they are not supported as they should because the aid is not forthcoming, my fear is that, as they are not economically profitable, the producers will abandon this ecosystem and try to find other ways." (F2, Spain, Urban)*
	Lack of clear policy	• *"You don't need permission to let your farm get overgrown or enter into succession, but you need permission to grow forest. Makes you think about where you draw the line." (P4, Sweden, Rural)*

urban land use, as well as littering and anti-social behaviour more often than other groups. Rural groups more frequently discussed overgrazing and pollution, and identified lack of training and knowledge of land managers, and lack of profitability as drivers of conversion of grassland to other land uses. Rural youth groups focused on conversion to crops, abandonment of grassland, and negative issues with tourists and visitors. Different issues were also reflected in each country. Participants in Switzerland and the UK discussed conversion to urban land most frequently, with the UK participants also focusing on the lack of profitability, visitors, and littering and anti-social behaviour. The Swiss participants focussed on overexploitation, reforestation, and tourism and visitors as the main issues affecting them. Participants in Spain brought up the issue of a lack of training and knowledge of farmers and land managers regarding management practices as a driver of problems, and overgrazing as a key issue of degradation. Swedish participants described abandonment of grassland the most frequently, together with overgrowing and conversion to urban use. In the Czech Republic, overgrazing and pollution, particularly in relation to use of manufactured fertilisers, were mentioned more than other issues. Such differences reflect the combination of socio-economic, political and environmental issues affecting each country, relating to the implementation and uptake of agri-environment policies, access to grassland, and the wider influence of economic policies relating to food and housing.

3.4. Management of grassland

Participants discussed many potential management approaches and techniques in relation to improving grassland landscapes, which were categorised into five themes, which relate to key social-psychological themes associated with behavioural change (education, rules, economics, tools and social pressure) (Lam et al., 2017), and a sixth relating to (participants' ideal) farming approaches (Fig. 4). Fig. 4 demonstrates the frequency that each theme (and corresponding sub-themes) were mentioned by participants, showing that education was the most frequently.

Table 6 gives examples of participants' discussion of each theme. Within the theme of education, education of consumers of grassland products regarding the value of grassland landscapes was the most frequently discussed. Participants assumed that more information provision through education would lead to decisions that favoured buying local products that were sustainably produced. Education was seen to be important via visits by the public to producers to learn about farming systems, or through adverts and marketing by supermarkets. Labels were recognised as important, but not the only necessary aspect of educating people about the value of products and sustainable systems. Information was thought to be needed to raise the profile of smaller producers as well as grass-fed meat. The trustworthiness of information was seen as important, and "greenwashing" was an issue. Education of children about the value of grassland and the countryside, was seen to influence more care for the countryside in the future and to encourage people to be more responsible consumers if the benefits of well managed countryside are embedded in societal knowledge (see Table 6).

Rules and regulations were seen to be necessary to control the use and management of the landscape and limit activities of land users and managers. Some participants criticised existing regulations and policies, whilst most people referred to the need for more or stronger regulation of farming activities, or the need for improved planning and land management policy (Table 6). Linked to this was the idea that the multifunctionality of certain landscapes should be protected or recognised, assisted by landscape strategies together with long term planning to establish embedded sustainable practices.

Participants in all countries referred to the need for farming that improved biodiversity and wildlife (including farming for nature). Traditional farming, extensive farming, natural management, specific approaches such as rewilding and regenerative agriculture, and specific actions such as reduced chemicals and change in livestock numbers, were held as ideals for improving farming. Economic aspects were tied closely to wider issues including food supply, food prices, climate change mitigation, food sovereignty and farmer livelihoods, and sustainability, biodiversity and the supply of ES from farmed land. A number of participants criticised the current model of subsidy for farmers, linking poor subsidies to unaffordable food and poor management choices by farmers. Agri-environment schemes and the potential positive effect they can have was acknowledged, although the success of these schemes was thought to be under threat. The need for consumers to be willing to pay more for products in order to support better use and management of grasslands was also discussed, e.g. through creating stronger links to local, small-scale farmers, and education of consumers. Potential payment by visitors to areas of the countryside, as well as

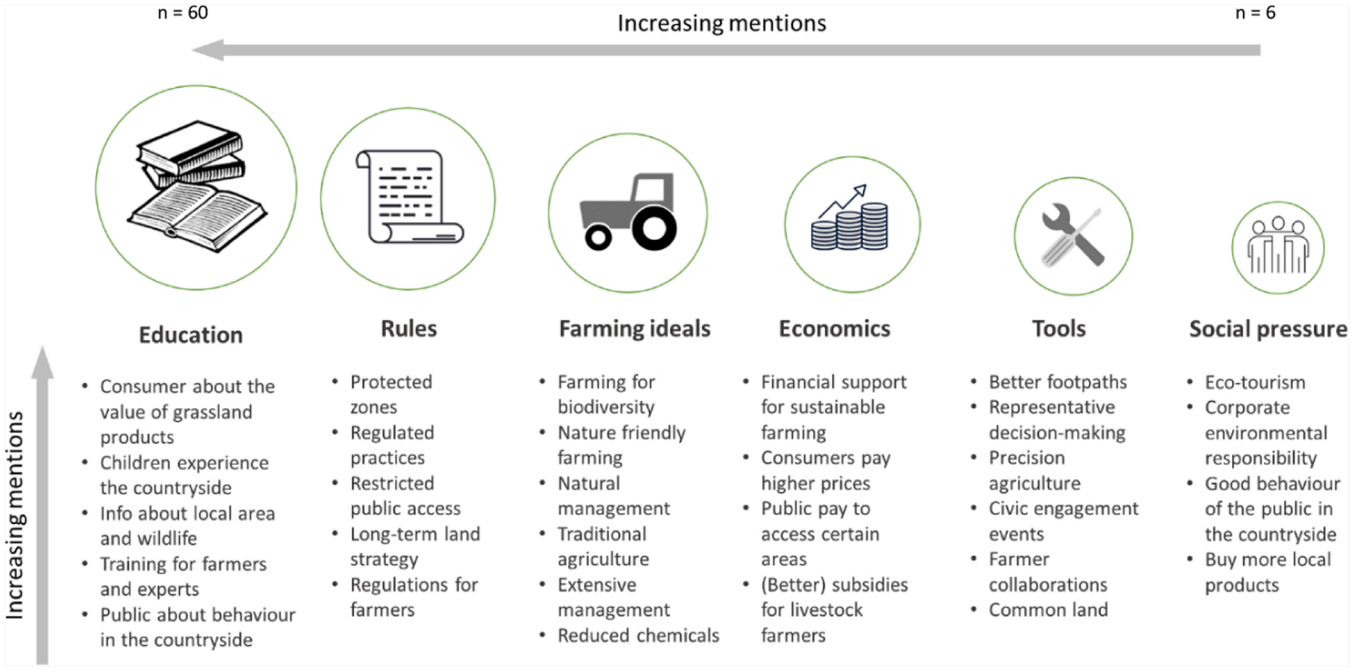

Fig. 4. Approaches and techniques for improving grassland landscapes described by participants, ordered by relative number of times each theme was 'mentioned' (representing instances where phrases stated by participants were coded to the relevant theme (n)) in each focus group.

raising a levy for homeowners to maintain areas of the countryside, were discussed in the context of economic functioning.

Specific mechanisms and techniques that could be used to improve grassland landscapes were described. These were varied but often linked to the improvement of access for the public to grassland spaces, including footpaths and signposts, and general information about where to visit. Governance changes included reference to more public representation in land use decision-making, and more community engagement events in grassland spaces, communal land ownership, and collectives of producers to share resources. The need for changes in behaviour of the public, through encouragement of eco-tourism, and better behaviour in grasslands in relation to litter, was identified as an issue. Some participants referred to the need for industry to take more corporate environmental responsibility, including supermarkets.

4. Discussion

Using focus groups with citizens from urban and rural areas in five European countries, this study has explored perspectives (including perceptions and values) of grassland landscapes, including the perceived benefits they provide, problems they face, and way they should be managed. Using an ES adapted framework, the range and types of ES that citizens associate with grassland at a landscape scale has been inferred. The results of this exploratory study will inform future research into citizen perceptions of grassland landscapes, including quantitative research at scale (Tindale et al., in preparation).

Table 6
Mechanisms perceived to improve grassland, with example quotes.

Improvement theme	Mechanism	Example quotes
1. Education	Information provision	• *"Perhaps if we were conscious in the supermarket when it came to making decisions, we would make a different kind of decision." (M1, Spain, Rural Youth)* • *"Veganism [is] obviously [a] big thing on the rise, and I think part of that is maybe, not in every case, but part of it could be, lack of education on how the meat and everything is actually produced and how it's sustainable." (M5, UK, Rural Youth)*
	Educating children	• *"When the children are shown, for example, the panels of honey, they are very impressed. They are natural products of the land, products that they see, that they learn, assimilate and integrate. Then, tomorrow, it will be easier to understand." (F4, Spain, Rural Youth)*
2. Rules and regulations	Land management policies	• *"Land owners should be limited by some regulations so that the landscape remains a landscape and then does not give the impression of a wasteland." (W5, Czech Rep, Urban)* • *"I think there is a lack of regulation. It is true that strong regulation is needed, but more than input regulation, political regulation is needed." (M3, Spain, Rural)*
3. Farming ideals	Farming for biodiversity	• *"They should promote biodiversity. Farmers should manage their pastures and meadows with foresight and the knowledge that they will continue to be important in the future […] and maintain the diversity of plant and animal species" (W4, Czech Rep, Rural Youth)*
4. Economics	Support for farmers	• *"Those who cannot spend more will always go for the cheap and efficient in terms of production, but perhaps not in terms of environmental care. This is where there is room for a policy that remunerates unpaid farm services, which allows for efficiency and cheaper production for the consumer, without overexploiting the land." (M2, Spain, Rural Youth)*
5. Tools	Infrastructure and land ownership	• *"What we need is parking spots, public transit to natural areas, roads adapted to the sheer amount of tourists that visit us, that go out in nature. The infrastructure around the flows." (P5, Sweden, Rural)* • *"I think a first step is that there is more, not private land, but common land, so that the community can decide what is done there and what is allowed there." (M1, Switzerland, Rural)*
6. Social pressure	Corporate responsibility and eco-tourism	• *" I think every organization has to take a bit of responsibility I think. Take better responsibility" (M1, UK, Urban)* • *"To reach the general public […]it may not necessarily be only with the sale of the products of the dehesa, but also with the enjoyment of the dehesa as an ecosystem, that is, all that is leisure associated with the dehesa" (F3, Spain, Urban).*

4.1. Plurality of values for grassland and ecosystem service delivery

Many participants described "layers" of benefits from grassland, acknowledging that some benefits underpinned or resulted in others. This understanding of complexity is not always transferrable to an ES analysis where each service is delineated, particularly when analysing provisioning, regulating and maintenance, and cultural ES together. Fig. 2 demonstrates the multiple connections identified between ecosystem features and perceived values and benefits. Many aspects of grassland can be encompassed by each ES category and are often interconnected. Moreover, many comments by participants were difficult to classify and fitted into multiple ES categories. Previous research indicates that cultural ecosystem services can be co-created, and result from a relationship between environment, culture, body and mind (Raymond et al., 2018). This combination emerged from participants' descriptions of grasslands, linking activities, feelings, experiences, and descriptions of intrinsic and extrinsic characteristics of the landscape. The top-down ES classification may not always be suitable for the analysis of stakeholder perceptions due to the complexity of ecosystems, as well as the multiplicity of perceptions of agricultural systems (Bernués et al., 2016).

Value perceptions can be understood as intrinsic, instrumental, and relational and can coexist in people's narratives about the importance of ecosystems (Arias-Arévalo et al., 2017). Many types of values existed for grassland and were held simultaneously by many participants. Such plural values have been shown to translate to spatial plurality of value when mapping value hotspots for grassland. Schmitt et al. (2022) showed synergies between intrinsic values and relational values of care, and instrumental values and relational values of sense of place (Schmitt et al., 2022). As with a number of other studies (e.g. Arias-Arévalo et al., 2017; Klain et al., 2017; Topp et al., 2022) relational values were most often expressed by participants in this research, referring to mental health benefits, quality of life, local identity, inspiration, spiritual and emotional connections, beauty, recreation and physical health, enjoyment and relaxation. Such aspects reflect constituents of a "good life" (Díaz et al., 2015) attributed to relational value, and begin to touch on embeddedness, collective meaning, flourishing, heritage, beauty, self-transformation, sense of place, spirituality, livelihoods, justice, conviviality, care, and kinship, which have been subject of previous studies of relational values of ecosystems (Admiraal et al., 2017; Arias-Arévalo et al., 2017; Cundill et al., 2017; Gould and Lincoln, 2017; Jackson and Palmer, 2014; Singh, 2015).

Alongside a significant consideration for relational values, citizens also emphasised intrinsic value of grassland proportionally more often than some other studies (Arias-Arévalo et al., 2017; Topp et al., 2022). In this research, intrinsic value (although often not described in isolation) related to the biodiversity supported by the landscape, including the provision of a 'home' for livestock. This emphasis on biodiversity of grasslands was also found in a study of pluralistic values of grassland in Bavaria, Germany (Schmitt et al., 2022), and attributed to the high biodiversity of grassland compared to other agricultural land. Schmitt et al. (2022) also highlight that lines between value attributions are often blurred. Intrinsic values can also be seen as relational values, particularly when related to care and stewardship of the environment (Muradian and Pascual, 2018; O'Connor and Kenter, 2019). When referring to problems with grassland landscapes, citizens often referred to loss of biodiversity as significant, linked to poor management and care, and degradation of the land. Functions of the landscape seen as important such as soil quality, water purification, oxygen production can be seen as intrinsic, but with underlying and implied links to instrumental and relational value. Examples of functions that were expressed in relation to the protection of human wellbeing included mitigation of climate change and reduction of the impact of extreme events. This emphasis on the intrinsic value of grassland, its relational significance, and link to human wellbeing in light of management decisions, demonstrates the importance of considering pluralistic values for future management decisions.

Instrumental values were expressed in relation to farmers making a living from grassland, the production of food, animal feed and other products, as well as the tourism industry. According to definitions (see Himes and Muraca, 2018), instrumental values associated with a certain ecosystem are, in theory, substitutable by other ecosystems with other land uses that produce similar benefits. However, due to the plurality of values people hold in relation to grasslands instrumental values are often inseparable from relational and/or intrinsic values. Many participants emphasised the characteristics of grasslands that facilitated the benefits and values they perceived. Characteristics were shared across all five case study areas and included the presence of livestock and wildlife; its beauty and natural qualities; its accessibility; its variety and diversity; the provision of balance in the landscape; and for providing relaxation, calmness and peacefulness. The combination of environment, experience, activity and positive emotion in descriptions exemplifies the connection felt between the environmental qualities of grassland and wellbeing, which also reflected relational values.

4.2. Perceptions of grassland in the rural landscape

Nature connectedness is a concept used to describe an individual's relationship with nature (Mayer and Frantz, 2004). This study has shown that people feel a connectedness to nature in grassland landscapes, at varying levels dependent on individuals and context. The nature connectedness felt within grasslands is important in terms of understanding the perception of grassland in the rural landscape (e.g. how people make sense of the landscape). Recent studies have shown causal links between nature connectedness and mental wellbeing (Pritchard et al., 2020), as well as more pro-environmental behaviours (Richardson et al., 2020). Many participants valued heterogeneity within the landscape, and although grasslands were an important part of landscape diversity, some people also found value in other landscapes such as forests, particularly if these were more familiar to them. In some countries (e.g. Czech Republic) forests were perceived as more accessible, with paths and roads leading through them, compared to meadows and pastures which were seen as difficult to walk or ride through, particularly in summer. Balance is a characteristic of rural landscapes that is valued, and provided by grassland, but the influence of familiarity of specific landscapes is significant (Aretano et al., 2013; Hinds and Sparks, 2008; Kaplan and Kaplan, 1989).

4.3. Sense of place in grassland landscapes

Although some perceptions and values of grasslands were shared across geographies, there were distinct local variations associated with the local landscape type, as well as the culture and societal use of grasslands. Sense of place (Stedman, 2016) is a concept that can be included in assessments of cultural ES, however, is one of the most neglected ES in terms of research due to its complexity (Hausmann et al., 2016). Sense of place is used to describe the attachments and meanings that people or groups attribute to place (Tuan, 1977), where place attachment is a multi-dimensional construct that considers place identity, place affect, place social bonding, and place dependence (Lewicka, 2011; Ramkissoon et al., 2013, 2012; Trentelman, 2009). Place meaning represents the reasons for the connection to place (Gottwald et al., 2022).

Place attachment and place meaning have been found to be variously and differently connected to the physical environment, where place meanings act as a mediator between place attachment and the physical environment (Stedman, 2003). Strong attachments have been shown to be linked to proximity to dwelling, with closer places associated with stronger attachments (Gottwald et al., 2022). Place attachment is also strongest where social ties are strong, linked to family connections or cultural practices (Storie et al., 2019). Some participants spoke more passionately about grasslands when there was a connection to home,

Table A1
Themes and prompts used to guide focus group discussions.

Theme	Prompts
Visiting the countryside	• Do you visit the countryside often, where do you go, how often?
Value of grassland	• Which types of landscape (that you see in the photos) do you prefer? Or not prefer? • What do you enjoy or value personally about these types of landscapes?
Benefits and services	• What benefits do you think grassland landscape provide? • Which benefits do you think are most important? • If grassland/ pasture/ fields weren't there, what do you think might happen? • What if grassland was converted to forested land/ wild land/ other land use?
Problems and improvements	• What would you want to improve about the grassland landscapes (in this area or areas you visit)?
Management and responsibility	• Do you know who makes decisions about grassland management? • Are there other people that should be involved in making decisions? Why?
Labelling	• If we were to label products from well managed grasslands with lots of benefits what type of information would be important to your purchase decision?

Table B1
ES themes mentioned by focus group participants, by focus group type (percentage of total number of phrases coded).

	Urban	Rural	Rural Youth	Total
Cultural				
Aesthetics	4%	6%	4%	5%
Cultural, symbolic, spiritual	4%	11%	6%	7%
Education and training	2%	5%	4%	4%
Mental health and wellbeing	9%	6%	3%	5%
Recreation, leisure and health	19%	17%	12%	15%
Provisioning				
Animals reared in housing and-or grazed outdoors	4%	11%	13%	10%
Animals reared for nutrition, materials or energy	26%	12%	11%	15%
Plants grown for nutrition or energy	0%	0%	1%	1%
Regulation and maintenance				
Air quality	2%	0%	1%	1%
Climate regulation (carbon storage and temperature)	2%	2%	7%	5%
Nutrient cycles	0%	2%	1%	1%
Providing habitats for wild plants and animals	24%	23%	19%	21%
Regulation of baseline flows and extreme events	4%	2%	4%	4%
Soil quality	0%	5%	8%	6%
Water supply and quality	2%	2%	3%	2%
Total	100%	100%	100%	100%

family, and a cultural identity in relation to grasslands. This, however, was not only linked to the current proximity of their dwelling to grasslands (e.g. urban or rural), but also where they had grown up or spent time in the past, and with significant people in their lives. Therefore, paying attention to people's past experiences, childhoods and social relationships in connection to grassland gives a deeper understanding of grassland's connection and value. Grasslands therefore can facilitate relational experiences that grow place attachment. Stronger place attachments may be linked to pro-environmental or pro-nature behaviours (Ramkissoon et al., 2013). Grassland has the potential for many and varied origins of place attachment through relationship, memory and experience as it is a multifunctional landscape facilitating farming, local economic activity through the sale of local food, and local recreational use due to its accessibility compared to other areas of the countryside (as recognised by many participant in this study). The variation in types of grassland and the cultural meaning across Europe is important to consider in relation to management policies, particularly through international legislation (such as within the EU). Flexibility in decisions about local management could offer a better sensitivity to the local variation in place attachment.

Place meaning is seen to be linked more closely and complexly to personal attributes, including environmental local knowledge (Gottwald et al., 2022), although this is debated (e.g. Lin and Lockwood, 2014). Some place meanings can be linked to cultural ES. However in this study, in line with (Gottwald et al., 2022), the ES concept did not fully reflect the relational values expressed by participants, such as well-being, memories, sense of home, or sense of connection to the local area and cultural meaning. Therefore, in agreement with the conclusions of Gottwald et al. (2022) 'deep meanings' relating to individual and subjective perceptions (such as memories, for example) should be integrated into future studies using ES analysis, alongside an understanding of the creation of place attachment and place meaning through sense of place.

4.4. Multifunctionality of grasslands as perceived by urban and rural dwellers in different country contexts

The results presented here suggest that citizens understand that grasslands are multifunctional. Not only do they express connections between multiple cultural ES and additional relational values (Plieninger et al., 2013), but also recognise the interconnectedness of all ES (which can be expressed as intrinsic, instrumental and relational values). As such, grassland benefits may be more effectively described as ES "bundles". Research into ES bundles have used the concept in relation to ES supply (Villamagna et al., 2013), but ES demand bundles are relevant for interpreting socio-cultural perceptions (Bernués et al., 2016; Martín-López et al., 2012). Distinction can be made between perceptions of the supply of ES from a landscape (e.g. what it currently offers: the focus of this research), and idealised visions of the ES a landscape can supply. Variation in current ES (benefits) described by citizens for grassland landscapes emerged between urban and rural residents, while younger rural residents held very similar views to all other rural residents. The lack of difference between rural residents of mixed ages and younger rural residents could be a signal that perceptions and values associated with grassland ecosystems are not simply linked to characteristics such as age, but more complexly linked to individual attributes, character traits, attitudes and preferences in relation to value expression (Gottwald et al., 2022). Links to individual attributes (such as underlying attitudes) could not be deciphered in this exploratory study and should be further investigated at greater scales.

Differences in perceptions between urban and rural residents indicates the influence of differences in individual attributes (e.g. on place meaning) and differential experience, and access to grasslands (influencing place attachment). Urban residents 'bundled' fewer benefits than rural residents and younger rural residents, primarily highlighting the supply of food and other products from grassland, biodiversity, and recreation and leisure. Rural residents, including younger rural residents, 'bundled' more benefits, highlighting a range of services. Rural-urban differences have been found in relation to ES bundles in previous studies of social preferences for ES (Bernués et al., 2016; Martín-López et al., 2012). Preferences are likely to vary due to a complex set of factors, including individual needs, cultural traditions, access to ES, and sources of household income, which may vary across the urban-rural divide (Martín-López et al., 2012). The higher range of benefits described by rural residents in this study may be because their wellbeing, lives and livelihoods are more closely related to more ES (Martín-López et al., 2012). Urban residents echo the more generalised preference of humans for provisioning services (Hartter, 2010), as food production is a very tangible benefit of grasslands (instrumental value). This is counter to previous research that found that there was less

Table B2
ES themes mentioned by focus group participants, by country (percentage of total number of phrases coded).

	Spain	UK	Switzerland	Czech Republic	Sweden	Total
Cultural						
Aesthetics	0%	9%	3%	4%	9%	5%
Cultural, symbolic, spiritual	9%	0%	10%	3%	9%	7%
Education and training	3%	5%	4%	4%	2%	4%
Mental health and wellbeing	6%	5%	7%	3%	6%	5%
Recreation, leisure and health	18%	27%	14%	9%	15%	15%
Provisioning						
Animals reared in housing and-or grazed outdoors	15%	5%	6%	17%	6%	10%
Animals reared for nutrition, materials or energy	21%	9%	10%	5%	31%	15%
Plants grown for nutrition or energy	0%	5%	0%	1%	0%	1%
Regulation and maintenance						
Air quality	0%	0%	3%	1%	0%	1%
Climate regulation (carbon storage)	3%	14%	1%	5%	6%	5%
Nutrient cycles	3%	0%	0%	3%	0%	1%
Providing habitats for wild plants and animals	12%	18%	32%	20%	17%	21%
Regulation of baseline flows and extreme events	0%	5%	1%	9%	0%	4%
Soil quality	6%	0%	4%	12%	0%	6%
Water supply and quality	3%	0%	3%	4%	0%	2%
Total	100%	100%	100%	100%	100%	100%

emphasis by urban residents on food provision as an important ES across multiple ES types (Martín-López et al., 2012), demonstrating the perceived importance of grassland for food provision for urban residents.

Participants often discussed the provision of 'local' products as a benefit. Local origin of grassland products can be an influential factor on consumer behaviour, including purchase likelihood and willingness to pay for product from grass-fed animals (e.g. Stampa et al., 2020). The differences in ES demand bundles across urban-rural populations could be significant for the management of grassland. Where the perceptions of the supply of ES from grassland are mismatched, it may be beneficial to consider the socio-cultural values placed on grassland by different populations, to better engage those populations, as well as provide a rural landscape that works for all beneficiaries.

ES demand bundles also varied across countries, with participants in each case study area describing a different combination of benefits. Such differences may represent the characteristics of the grassland ecosystem, agricultural priorities within the region, the biophysical environment and culture. The consequence of understanding the ES demand bundles that emerge in different countries in relation to grassland could be important for the tailoring of policies influencing land use decision-making. It is useful to better understand the spatial mismatches between ES supply bundles, driven by physical environmental characteristics combined with policies, economics and individual land-manager decisions, and ES demand bundles (perceptions of the supply of ES). Better understanding could help make better land-use decisions and policy, particularly in relation to how spatial mismatches are experienced by different groups (e.g. urban-rural populations) (Zoderer et al., 2019).

4.5. *Problems and threats to grassland: Ecosystem disservices*

Problems and threats perceived by citizens to be associated with grasslands broadly match those categories identified by experts, including conversion, degradation and abandonment. The multi-functionality of grasslands is reflected in the range of ES that could be lost (or had been lost), as well as disservices that could arise (or had arisen) as a result of problems in grassland landscapes. These included cultural, regulating and provisioning ES (see Fig. 3). These also relate to losses of values, particularly relational values. More cultural ES (including relational values) were discussed compared to the other classifications of ES, which may reflect the personal and experiential nature of loss or degradation of grassland, and represent the process of heuristic reasoning where losses are weighed more highly than gains (Kahneman et al., 1982). Loss and degradation may reduce the nature connectedness that grasslands offer and reduce the opportunity for place attachment to grow (e.g. participants described losing memories (place identity), sense of safety (place affect) or traditional jobs (place dependence)). Different perceptions of grasslands that emerge through the discourse of loss or degradation, compared to benefit, may be important for the communication of management decisions and mediation between groups when there is a conflict of interest associated with potential loss of grassland areas. Under some circumstances, ecosystem disservices may influence people's actions in relation to management of ecosystems more than ES (Blanco et al., 2019a). Previous studies have shown that land management decisions can be driven by prevention of certain ecosystem disservices (e.g. diseases (Friess, 2016), poisonous plants and soil degradation (O'Farrell et al., 2007), dangerous falling trees (Conway and Yip, 2016), labour required to manage hedgerows (Blanco et al., 2019b)). This is despite decision-makers showing knowledge of, and giving importance to, ES during research interviews and surveys. Ecosystem disservices emphasised by citizens should also influence decision-making and may mean that more relational values become drivers of change.

Conversion of grassland to urban land use was identified as significant problem by participants (associated with financial pressures on farmers to sell their land to developers, as well as the political will to build houses, and a demand for affordable housing). The prevalence of the problem as a threat to grassland is in line with other studies (see Pellaton et al., 2022). Urban dwellers discussed this issue as significant, perhaps because it is an easily observable land-use change, closely linked to negative emotions, which can be a strong driver of opinion or perception. Moreover, loss of human-nature connectedness and relational values may be particularly significant if changes are rapid and extreme (Riechers et al., 2022), such as conversion of grassland. During focus group discussions, in some cases, grassland was referred to more generally as "green space". The issue of development of green space in the countryside may have represented a wider issue of environmental damage to participants. The urban focus group participants described grassland conversion to urban land use as a problem more frequently than both younger and mixed age rural groups in the context of personal experiences. Urban dwellers potentially have more awareness of urban expansion happening in their town or city. Rural focus group participants described issues of grassland degradation, particularly over-grazing, potentially because it was closer to their experience. Perceptions of issues in grassland landscapes are therefore likely to be linked to the individual experience of citizens, and the cultural and land-management history and context of the area.

Citizen's perceptions of the drivers of problems in grasslands were varied, but often converged around cross-cutting themes. For example,

poor profitability of grassland production was seen to drive degradation and abandonment across all countries. This was linked to changing markets affecting imports, prices and powers of supermarkets. Other drivers of problems were perceived to be connected with political and economic contexts, such as lack of relevant policy, training, changing subsidies, government agendas for housing, land ownership, and changing rural populations. In other studies assessing landscape benefits policies and markets were thought to be the most prominent indirect driver of change in landscapes including mountain areas, which contain grassland (Martín-López et al., 2019). Equally, population growth and urbanisation have been evidenced as relevant drivers of European biodiversity decline (Fischer et al., 2018). Citizens' perceptions of grassland and ES delivery are connected to their perceptions and knowledge about the wider socio-economic system, indicating that citizens directly and indirectly connect grassland land use with wider socio-economic drivers of change.

Grasslands can be understood as social-ecological systems (Ostrom, 2009; Vanwindekens et al., 2013), in which resources, users, physical systems and governance systems interact in social, economic and political settings to give specific outcomes, an assertion supported here. The results show that perceptions of actors (e.g. citizens) within social-ecological systems can be usefully collated to highlight the most important relationships within systems (e.g. Vanwindekens et al., 2013). Where previous research has focused on farmers within grassland systems, a better understanding of the perceived dynamics of such systems amongst different groups, including citizens, may help to identify common ground when trade-offs and conflicts occur. This may be useful where institutional change is needed to create sustainable agri-food systems, including grasslands, across Europe.

4.6. Sustainable consumption of grassland products: citizen-consumer identities

Citizens' assessment of the management approaches needed to improve grasslands across all case study countries emphasised the need for education (e.g. Fig. 3), for example in relation to the value of grassland products. Individuals can hold identities as both citizens and consumers, but there is often an assumption that, in their role as a consumer, an individual may have different priorities to that held in a citizen's role. Concepts such as the 'citizen-consumer' represent individuals who use particular values to make decisions about food purchases that go beyond individual concerns (MacRae et al., 2012). Participants in this study expressed a need to connect citizen and consumer identities in relation to grasslands, in ways that connect to trends in Europe and beyond in relation to sustainability and environmental concerns influencing food choices (Ehgartner, 2018; Hirth et al., 2021; Levidow, 2015). As yet, however, there are few tangible ways for consumers to make informed sustainable choices, with the exception of origin labels, organic labels and some trials of eco-labelling (Hartmann et al., 2021). Other studies identify evidence of confusion about products from grassland and terms used to label such products e.g. grass-fed (Stampa et al., 2020). Participants in this research identified issues with current food labelling, as well as difficulty in justifying spending more on sustainable grassland products. However, multiple social and environmental factors shape food choices and behaviours, over and above education and information provision (Monterrosa et al., 2020). Moreover, participants recognised the need to build place attachment, meaning, and nature connectedness to potentially influence a more deep-rooted cultural shift towards pro-environmental behaviour, including consumer choices (Richardson et al., 2020).

4.7. Agricultural and environmental policy agendas and goals for grassland

Citizens also recognised that the policy mix associated with grassland management is complex, and there are many relevant polices, sometimes with conflicting agendas (Hunter et al., 2020), and many potentially not known to all citizens. Rural dwellers, including younger rural dwellers, were more likely to describe issues with current policy such as the EU Common Agricultural Policy (CAP), and therefore emphasise the need for financial support for farmers. Even though many legislative policies protecting special landscapes and ensuring environmental standards already exist, citizens may have seen a need for stronger legislation and rules to improve accountability in decision-making, and ensure standards are met. Therefore, more transparency is needed about the management of the countryside. In some countries, trust in government to develop or implement the right policy, or in farmers to make the right decisions was low, particularly where political or policy complexity was perceived to be high. Addressing issues of trust in decision-makers is key to engaging or communicating with citizens.

Solutions may also lie in finding common ground amongst stakeholders, including citizens, in relation to agricultural and environmental policy agendas and goals. Citizens highlighted farming ideals, including farming for biodiversity, nature friendly farming, and using "natural" techniques to manage grassland. These goals were described across all five case study countries, suggesting that there are shared ideals amongst citizens for grassland farming. If the broader idealistic goals are agreed upon by farmers and citizens, and transparently communicated, there may be more coherence in delivery of ES that benefit more widely. This may be particularly relevant where values (that underpin perceptions) also align spatially in order that land-use and land-management changes can be made that are more likely to be publicly accepted (Schmitt et al., 2022). Difficulties often arise when goals between farmers and citizens are not aligned (Schmitt et al., 2020). Farming for biodiversity, particularly in grassland, is often desired by many farmers, but factors such as financial viability and risk-perception may affect farmers' ability to take up agri-environment schemes (e.g. Wezel et al., 2021). Goals therefore also need to be aligned with successful support for farmers and land managers, a consistent theme suggested by participants to improve grassland management. Improved communication of citizen priorities to farmers and land managers could legitimise change in the wider economic system, as well as initiate dialogues about mismatched policy goals and delivery mechanisms. Overall, citizens' opinions (based on their perceptions and values) about management of grassland show potential for influence through soft policy instruments, where elements such as education, involvement, and shared ideals, rooted in an understanding of citizen's sense of place and place attachment for grassland, could be encouraged alongside harder policy instruments, to better align idealistic goals with practical reality for farmers.

4.8. Limitations

This research was an exploratory study, limited in size and scope. Thus, no general conclusions for the continental scale could be made. The results therefore are indicative rather than representative of the social and demographic groups included. Based on this limitation, the results should be a starting point for further research.

The research was conducted during 2020 and 2021 when much of Europe was experiencing the COVID-19 pandemic. There were restrictions on travel and movement in many countries including within rural areas. The necessary online focus group methodology needed to account for this context may have limited some of the interactive elements of the focus group discussions. The adaptation required in different countries at the time also affected the consistency of recruitment methodologies, which may have influenced the results. Participants' perspectives about grassland landscapes were also potentially affected by the events and circumstances of that time. To take this into account, we included discussions of the effect of the pandemic on use and valuation of grasslands and the countryside in general. There were mixed results amongst participants depending on where they lived, and

in relation to the local pandemic restrictions. Some participants found the pandemic increased their valuation of local grassland and the countryside as spaces for recreation, socialising, fresh air, and to escape from the "everyday", particularly for urban dwellers. Some rural dwellers felt worried at the increase in visitors to the countryside, and others happy with less visitors when restrictions on travel applied. Many participants commented on the emphasis on local food supply chains during the pandemic, and discussed changes to their own food purchases as a result. Most participants were unsure if changes would be sustained after the pandemic, but the results indicated that there were significant effects on their experiences, understanding and valuation of the countryside at the time.

5. Future research

This exploratory study has indicated that the heterogeneity of citizen perspectives on grassland could be further explored through large scale surveys. This could better connect perceptions with characteristics, personal attributes, and geographical variation. Large scale surveys could also better explore citizen's attitudes, which were not able to be assessed in this smaller, qualitative study. Future research could also explore further the cross-cultural issues of ES perceptions and values for grassland landscapes. In addition, future research is needed into how to balance different stakeholders' perspectives, including citizens', in order that grassland can be managed in a way to balance ES delivery, acknowledge pluralistic values, and reduce conflict when changes occur.

6. Conclusions

This exploratory research has applied a qualitative approach to explore the perspectives of citizens (including perceptions and values) to evaluate the ecosystem services and disserves delivered by PG in five European countries. The results indicate that citizens perceive a range of ES provided, which are linked to multiple values that can be held simultaneously. Plural valuation can help to identify values that are not yet integrated into management objectives, and can help to create recommendations for environmental management as well as policy goals that take into account trade-offs and synergies (Arias-Arévalo et al., 2017; Schmitt et al., 2022). Differences in perceptions and values were observed between urban and rural groups (mixed age and rural youth), and between different countries, suggesting that some national and local policy differentiation might be required to guide decision-making for grassland management. Although this needs to be confirmed using larger, nationally representative samples.

The implications of this research are that as agricultural landscapes are continually contested areas, a better understanding of citizen perspectives may lead to better conceptualisation of how and when mismatches in (perceptions of) ES supply and demand (including relational values) occur. It may allow better communication between stakeholder groups, including citizens, farmers and policy-makers, particularly if shared ideals or (social-ecological) systems understandings can be incorporated into deliberations or decision-making processes. Changing policy would also need to address people's interconnected identities as citizens and consumers, facilitating regionally-specific connection and attachment to grasslands through education, shared ideals, and discourses, emphasising the multiple values of grassland at a local and landscape scale. This may help improve pro-environmental behaviour to facilitate transition to sustainable grassland systems.

Data Availability

Data will be made available on request.

Acknowledgements

This work was supported by the EU H2020 programme SUPER-G – Developing Sustainable Permanent Grassland Systems and Policies [grant number 774124]. The authors would like to extend thanks to the participants of the focus groups; to those colleagues who helped to facilitate and co-facilitate focus groups in each country; and to Isabel L. Castillejo González who designed the map included here.

Appendix A

See Table A1.

Appendix B

See Table B1 and Table B2.

Appendix C. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.landusepol.2023.106574.

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