

MultiSward

Multi-species swards and multi scale strategies for multifunctional grassland-base ruminant production systems

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Note with most appropriate scenarios for multi-functional grasslands

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Concerned workpackage leader: DLO-LR (Dr. Agnes van den Pol-van Dasselaar)

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Dissemination level: PU

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Summary

Objective of the deliverable:

To briefly discuss appropriate scenarios for multi-functional grasslands based on the importance attached to different functions of grassland by stakeholders.

Activities:

- Analysis of results of an extensive questionnaire among stakeholders
- First analysis of results of a short questionnaire among stakeholders (this questionnaire closed 15 November 2013, a full analysis is planned for the next Deliverable 1.6)
- Analysis of results of (inter)national stakeholder meetings
- Reflection on scenarios with different grassland acreages (less and more than the current)

Teams involved in stakeholder consultation:

Wageningen UR Livestock Research (DLO-LR), The Netherlands
Institut National de la Recherche Agronomique (INRA), France
Teagasc, Ireland
Poznan University of Life Sciences (PULS), Poland
Università degli studi di Udine (UNIUD), Italy

Geographical areas covered:

Atlantic regions, mountainous regions, Mediterranean regions, continental regions

Summary:

Questionnaires among different stakeholders and different regions in Europe provided insight into the appreciation of the current and future expected functions of grasslands in Europe. The results showed that the different functions of grasslands are highly recognized and appreciated. The large European grassland area is essential for economy, environment and people. Results of questionnaires provided insight in the value of the different ecosystem services that grasslands provide and of different components of these services for different stakeholders in different regions. The data confirm that the different services provided by grasslands are well recognized by all relevant stakeholder groups. It is therefore important that future policies continue to support conservation of grasslands. Scenarios with less grasslands will lead to an overall decrease in total ecosystem services delivered, since grassland is the only land use option which is capable of delivering a large number of ecosystem services simultaneously. Maintaining or increasing the grasslands area and thus securing the importance of the different functions and services of grasslands in Europe is a challenge for the coming years. This is the most appropriate scenario. Furthermore, it is an extremely important scenario ensuring the continuation of different ecosystems being delivered simultaneously by multifunctional grasslands.

1. Introduction

Sustainability (profit, planet, people) is high on the societal, political and economic agendas. The EU-project MultiSward aims to increase reliance on grasslands and on multi-species swards for ruminant production contributing to increased sustainability and competitiveness of livestock production systems, increased food security and enhanced environmental goods while securing optimal European grassland acreage. In order to achieve this, MultiSward wants the active participation of stakeholders and the identification of stakeholder requirements and expectations with respect to multi-functionality of grasslands within Europe.

An international team of representatives of five countries throughout Europe has therefore been established, representing the different regions in Europe. The countries are Ireland, the Netherlands, France, Italy and Poland representing Atlantic, Mountainous, Mediterranean and Continental regions. The international team facilitates and stimulates the stakeholder consultations and discussions by securing the different steps of a multi-stakeholder process: setting up the process, strategically planning the process, implementing and managing the process, learning through monitoring and adapting. The team is in charge of organising national and international meetings and questionnaires throughout Europe. Furthermore, the team collects and synthesizes the output of these meetings and questionnaires.

Six deliverables of MultiSward are related to stakeholder consultation. Deliverable 1.1 of MultiSward (de Vlieghe and van Gils, 2010) reported on the roles and utility of grassland in Europe. Deliverable 1.2 (Pinxterhuis, 2011) reported on the appreciation of the current and future functions of grasslands in Europe and identification of implementation gaps between today and future multi-functionalities, as seen by international stakeholders. Deliverable 1.3 (Van den Pol-van Dasselaar *et al.*, 2012) reported on the appreciation of the future functions of grassland and identification of research and implementation gaps between today and future multi-functionalities by national stakeholders. This deliverable was based on first results from an extensive questionnaire, national meetings and a workshop during the Annual Meeting of MultiSward in 2012. Deliverable 1.4 (Van den Pol-van Dasselaar, 2013) was a note on near-future policies (2012-2020) regarding grasslands that will be required to fill gaps between today and future multi-functionalities by stakeholders. However, no gaps could be detected.

The aim of the current Deliverable (“D1.5 Note with most appropriate scenarios for multifunctional grasslands”) is to briefly discuss scenarios for grasslands. The identification of most appropriate scenarios is based on the opinion of stakeholders on grasslands as a result of the above-mentioned extended questionnaire and first results of a short questionnaire which was developed in 2012, in agreement with the discussion of the 2012’ general assembly, and put on-line in 2012 and 2013. The opinion of the stakeholders, which is the basis for D1.5, has been discussed at the Symposium of the European Grassland Federation in Iceland in June 2013. The current deliverable D1.5 is based on the corresponding paper (Van den Pol-van Dasselaar *et al.*, 2013). In a few months from now, the final Deliverable D1.6 will be delivered (“Synthesis paper on perception of European stakeholders on

multifunctional grasslands”), in which the final results of all questionnaires and meetings will be jointly analysed and presented.

2. Materials and method

A questionnaire on multi-functionality of grasslands was developed in 2011 in five languages: Polish, Dutch, Italian, French and English (see Appendix 1). The questionnaire was available in a paper version in a few countries and available as soon as February 2011 in France and on-line after few months (www.multisward.eu). There were questions on sustainability of grasslands and ecosystem services provided by grasslands. Sustainability covers economic, environmental and social issues (profit, planet, people). Respondents to the questionnaire were asked to divide 10 points across these three aspects of sustainability, giving most points to the one they considered the most important aspect (e.g. 4, 3, 3 if they consider that ecological and social aspects are of equal interest and that economy is slightly more important). Ecosystem services can be divided in four groups: provisioning services (e.g. production of food, water), regulating services (e.g. control of climate and disease), supporting services (e.g. nutrient cycles, crop pollination) and cultural services (e.g. spiritual, recreational). Respondents to the questionnaire were again asked to divide 10 points over the four groups of ecosystem services. The set-up and analysis of the questionnaire have been extensively described by Van den Pol-van Dasselaar *et al*, 2012). To increase the number of responses on the most important questions, it was decided during the general assembly in 2012 to develop a simplified version of the questionnaire (short questionnaire, see Appendix 2). This questionnaire focused on the division of 10 points across the three aspects of sustainability and on the value of the different functions of grasslands. The questionnaire was available in Polish, Dutch, Italian, French, English, German, Swedish and Danish and it was widely spread in many European countries: Ireland, UK, Sweden, Denmark, the Netherlands, Belgium, Germany, Poland, France and Italy. Also a few people from other countries responded, as it was also spread to international networks, e.g. of the European Grassland Federation. The questionnaire was closed at 15 November 2013 and by then there were approximately 2000 valid responses. A full analysis of the results will be part of Deliverable 1.6. However, first results have been used to check the general validity of conclusions of this deliverable.

3. Results - Importance of different functions of grasslands

The different meetings and the questionnaires (both extensive and short) provided valuable information on the importance of different functions of grasslands as perceived by the stakeholders. At the start of the MultiSward project, an international stakeholder consultation (Pinxterhuis, 2011; van den Pol-van Dasselaar *et al*, 2012) showed that economic functions of grasslands, mainly feed for herbivores, were considered the most important in most countries. Stakeholders expected this to remain unchanged in future. Environmental functions of grasslands were placed

second: water quality and quantity, adaptation to climate change, mitigation and biodiversity. Finally, social services were mentioned.

From the results of the extensive questionnaire (160 valid responses), further information was obtained for different stakeholders and for different regions (Figure 1). In general profit was considered to be the most important aspect, followed by planet and followed by people. Some observations:

- Primary producers and to a lesser extent industry parties gave a higher value to profit than the other stakeholders and a lower value to the other components, especially people
- Both France and Italy valued people aspects relatively higher and profit aspects relatively lower

Grasslands can provide several services, the so-called ecosystem services. Figure 2 shows that provisioning services were considered to be the most important services. However, there were clear differences between stakeholders and between regions. The differences between regions reflect the differences in the farming structure throughout Europe.

There were almost no differences in stakeholders' appreciation of today and future functions of grasslands (not shown). The only remark from the stakeholders was that they expect increasing importance of both feed protein supply at farm level and environmentally friendly systems. Reasons for the lack of large differences between appreciation of today and future functions may be that there is no difference or that stakeholders cannot yet imagine differences in appreciation between today and the future (Van den Pol-van Dasselaar, 2013).

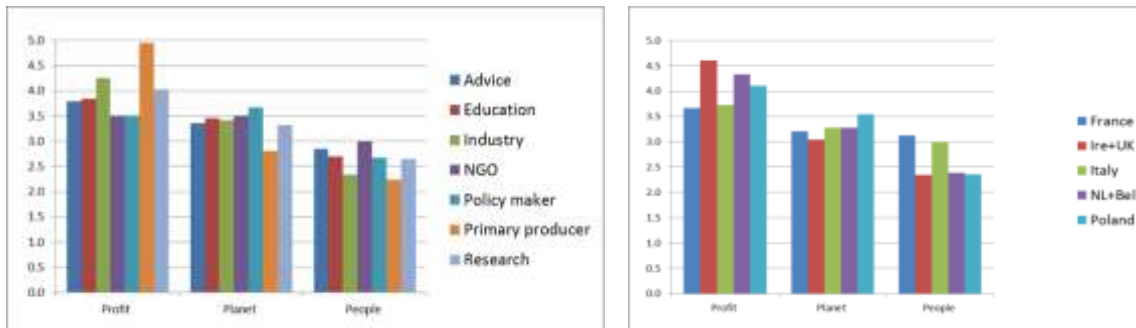


Figure 1. Importance of aspects of sustainability for different stakeholders and different regions (total of people, planet and profit equals 10 for each stakeholder group or region) (Van den Pol-van Dasselaar et al., 2013).

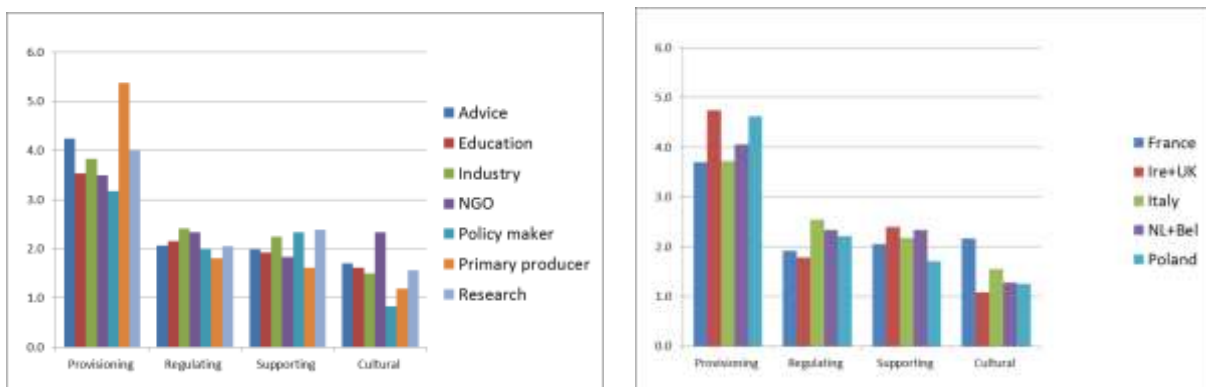


Figure 2. Importance of ecosystem services for different stakeholders and for different regions (total equals 10 for each stakeholder group or region) (Van den Pol-van Dasselaar et al., 2013).

A first analysis of the results of the short questionnaire (around 2000 responses) increased our understanding on the opinion of the stakeholders. Full results will be available in the next Deliverable (D1.6), but first results confirm the findings of the extensive questionnaire. Many functions of grasslands and ecosystem services are seen as very important (on a scale ranging from not important to very important). Grasslands are considered a valuable resource.

4. Conclusions – scenarios for multifunctional grasslands

The questionnaires and the national meetings provided insight in the appreciation of different functions of grasslands in Europe. They clearly showed that the different functions of grasslands are highly recognized and appreciated by all relevant stakeholder groups. The large European grassland area appears to be essential for economy, environment and people. It is therefore important that future policies continue to support conservation of grasslands. Scenarios with less grassland will lead to an overall decrease in total ecosystem services delivered, since grassland is the only land use option which is capable of delivering a large number of ecosystem services simultaneously.

We conclude that all stakeholders consider grasslands to be a valuable resource in Europe. Maintaining or increasing the grasslands area and thus securing the importance of the different functions and services of grasslands in Europe is a challenge for the coming years. This is the most appropriate scenario. Furthermore, it is an extremely important scenario ensuring the continuation of different ecosystems being delivered simultaneously by multifunctional grasslands.

References

De Vlieghe A. and van Gils B. (2010) *Report on roles and utility of grassland in Europe*. Report MultiSward, ILVO, Belgium.

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Van den Pol-van Dasselaar A., P. Goliński, D. Hennessy, C. Huyghe, G. Parente, J.L. Peyraud and J.B. Pinxterhuis (2012) *Report on appreciation of the future functions of grassland and identification of research and implementation gaps between today and future multi-functionalities by national stakeholders*. Report MultiSward, Wageningen UR Livestock Research, Lelystad, the Netherlands.

Van den Pol-van Dasselaar A. (2013). *Note on near-future policies (2012-2020) regarding grasslands that will be required to fill gaps between today and future multi-functionalities of grasslands as seen by national stakeholders*. Report MultiSward, Wageningen UR Livestock Research, Lelystad, the Netherlands.

Van den Pol-van Dasselaar A., Goliński P., Hennessy D., Huyghe C., Parente G., Peyraud J.L. and Stienezen M.W.J. (2013) *Appreciation of current and future functions of grassland by international stakeholders in Europe. Grassland Science in Europe 18*.

Appendix 1: Extensive questionnaire

Questionnaire for stakeholder consultation 2011 on multi-functionality of grasslands in Europe

MULTISWARD is an EU-project aiming to improve the use of grasslands in Europe. To achieve this, the project will focus on:

- increasing reliance on grasslands and on multi-species swards for ruminant production
- contributing to increased sustainability and competitiveness of ruminant production systems
- increasing food security
- enhancing ecosystem services (e.g. biodiversity, water and soil quality)

In order to achieve these objectives, MULTISWARD will conceive, evaluate and promote sustainable ruminant production systems based on the use of grasslands, and provide adequate evaluation tools to assess the best means of combining high production efficiency with optimal provision of regulating and supporting services from grasslands at farm and regional levels. MULTISWARD also aims to identify and analyze the effects of socio-economic and policy scenarios supporting or constricting grassland development or inducing grassland replacement by annual crops in order to support the design of future policies.

MULTISWARD wants active involvement of stakeholders. This involvement supports the development of a common learning environment on grassland based farming systems, it will improve the scope for anchoring new developments (in MULTISWARD as well as in concurrent or future projects), which are based on better understanding of societies perspective on sustainability of grasslands.

In this initial phase of the project stakeholders will be consulted to help define:

- Which farming systems currently make use of grasslands?
- What functions grasslands are required to fulfil, now and in the future?
- How the quality of the contribution of grasslands to these functions is, or can be, measured (indicators)?
- What constraints prevent grasslands fulfilling the required functions?
- What near-future policies (2010-2020) are foreseen to impact on (use of) grasslands?

On the following pages a questionnaire can be found. This is the basis for a consultation in five countries, Ireland, the Netherlands, France, Italy and Poland, representing different regions in Europe (Atlantic, Mountainous, Mediterranean and Continental). The consultation will be organised as national meetings, online questionnaires, and in some cases individual interviews.

NOTE: this questionnaire is to obtain the thoughts and opinions of a range of stakeholders. You are asked to fill in this questionnaire to give your own perception of the use of grasslands in your region. So you do not need to do

any research to complete this questionnaire. Filling in the questionnaire may take up to half an hour.

A note on privacy

This survey is anonymous.

The record kept of your survey responses does not contain any identifying information about you unless a specific question in the survey has asked for this. If you have responded to a survey that used an identifying token to allow you to access the survey, you can rest assured that the identifying token is not kept with your responses. It is managed in a separate database, and will only be updated to indicate that you have (or haven't) completed this survey. There is no way of matching identification tokens with survey responses in this survey.

1-6

Country

Region

Name

E-mail address

Organisation

To which group does this organisation belong?

Choose one of the following answers

Please choose...



7-8

Sustainability is high on the societal, political and economic agendas. Sustainability covers economical, ecological and social interests. Please divide 10 points over these three aspects of sustainability, giving most points to the one you consider most important aspect: (e.g. 4, 3, 3 if you consider that ecological and social aspects are of equal interest and that economy is slightly more important)

Only numbers may be entered in these fields

Total of all entries must equal 10

- Economical
- Ecological
- Social
- Total:

Ecosystem services can be divided in four groups: provisioning (production of food, water), regulating (control of climate and disease), supporting (nutrient cycles, crop pollination) and cultural (spiritual, recreational). What ecosystem services do grasslands provide in your region? Please divide 10 points over the four groups of ecosystem services, giving most points to the group of services you think is the most important in general: (e.g. 4, 2, 2, 2 if you consider provisioning services most important and the other services of equal interest)

Only numbers may be entered in these fields

Total of all entries must equal 10

- Provisioning (production of food, water)
- Regulating (control of climate and disease)
- Supporting (nutrient cycles, crop pollination)
- Cultural (spiritual, recreational)
- Total:

9

For which provisioning services are grasslands important in your region today? (1 = not important; 5 = very important).

	1	2	3	4	5
Biomass for energy production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forage of high quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Dairy cows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Goats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wool production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honey production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Goat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Production of plant fibre (e.g. for paper)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutritional quality of animal products for human consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
'Region of origin' of animal products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent are in your region these services provided by grasslands only? (Exclusivity, Y = service only provided by grassland; Uncertain = I do not know; N = service not exclusively provided by grassland).

	Yes	Uncertain	No
Biomass for energy production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forage of high quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Dairy cows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Goats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wool production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honey production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Goat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Production of plant fibre (e.g. for paper)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutritional quality of animal products for human consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
'Region of origin' of animal products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How important do you expect the following provisioning services to become in your region in the next 10 years compared to today? (-- becomes much less; = stays similar; ++ becomes much more)

	--	-	=	+	++
Biomass for energy production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forage of high quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Milk production : Dairy cows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Goats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wool production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honey production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Goat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meat production : Sheep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Production of plant fibre (e.g. for paper)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutritional quality of animal products for human consumption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
'Region of origin' of animal products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Others...

10

For which regulating services are grasslands important in your region today? (1 = not important; 5 = very important).

	1	2	3	4	5
Adapting to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigating green house gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation of ecosystems/biodiversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avalanche control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil pathogen control in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Erosion control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fire control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flood plains of rivers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water catchment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carbon sequestration/storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent are in your region these services provided by grasslands only? (Exclusivity, Y = service only provided by grassland; Uncertain = I do not know; N = service not exclusively provided by grassland).

	Yes	Uncertain	No
Adapting to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigating green house gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation of ecosystems/biodiversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avalanche control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil pathogen control in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Erosion control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fire control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flood plains of rivers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water catchment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carbon sequestration/storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How important do you expect the following provisioning services to become in your region in the next 10 years compared to today? (-- becomes much less; = stays similar; ++ becomes much more)

	--	-	=	++	++
Adapting to climate change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mitigating green house gas emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation of ecosystems/biodiversity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avalanche control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Soil pathogen control in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Erosion control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fire control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flood plains of rivers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water catchment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carbon sequestration/storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Others...

11

For which supporting services are grasslands important in your region today? (1 = not important; 5 = very important).

	1	2	3	4	5
Animal welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation/improvement of soil structure and fertility in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop pollinisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extent are in your region these services provided by grasslands only? (Exclusivity, Y = service only provided by grassland; Uncertain = I do not know; N = service not exclusively provided by grassland).

	Yes	Uncertain	No
Animal welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation/improvement of soil structure and fertility in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop pollinisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How important do you expect the following provisioning services to become in your region in the next 10 years compared to today? (-- becomes much less; = stays similar; ++ becomes much more)

	--	-	=	++	++
Animal welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of water	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation/improvement of soil structure and fertility in cropping systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop pollinisation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Others...

◀
▶

12

For which cultural services are grasslands important in your region today? (1 = not important; 5 = very important).

	1	2	3	4	5
Maintaining populations in rural areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive perception of animal production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tourism or recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supporting horses for equestrian sport and recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To what extend are in your region these services provided by grasslands only? (Exclusivity, Y = service only provided by grassland; Uncertain = I do not know; N = service not exclusively provided by grassland).

	Yes	Uncertain	No
Maintaining populations in rural areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive perception of animal production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tourism or recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supporting horses for equestrian sport and recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How important do you expect the following provisioning services to become in your region in the next 10 years compared to today? (-- becomes much less; = stays similar; ++ becomes much more)

	--	-	=	+	++
Maintaining populations in rural areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Positive perception of animal production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tourism or recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Supporting horses for equestrian sport and recreation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural values	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Others...

13

What are in your opinion the main interests and the main restrictions for increasing the use of grassland based systems from the farmers' point of view?

Importance today

	1	2	3	4	5
Adaptability to price volatility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competitiveness of animal production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of production system management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal production per livestock unit or per ha	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining relation with neighbours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking account of animal welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decreasing consumption of non-renewable energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing feed protein supply at farm level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistency of forage production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmentally friendly systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How would you rate the relevance of the following items for tomorrow compared to today?

	--	-	=	+	++
Adaptability to price volatility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Competitiveness of animal production systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of production system management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal production per livestock unit or per ha	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining relation with neighbours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking account of animal welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decreasing consumption of non-renewable energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing feed protein supply at farm level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Consistency of forage production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmentally friendly systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Others...


14-19

What percentage of nature conservation areas in your region consist of grassland?

What percentage of the productive agricultural area in your region is in grassland?



What trends (e.g. economic, political, social, environmental trends) do you see occurring that are impacting on the use of grasslands? Do you consider that these trends will increase or decrease the area of grasslands in your country?



What ecosystems services (as mentioned in Q9 to Q12, please mention any others you consider relevant) should be market driven? I.e. the costs should be paid by the users/consumers and the market regulates the quality. What is the situation at present in your region?



What ecosystems services (as mentioned in Q9 to Q12, please mention any others you consider relevant) should be under public control and paid for by governments? What is the situation at present in your region?

How is the quality of the provided ecosystems services (as mentioned in Q13 to Q16, please mention any others you consider relevant) measured in your region? Who is responsible for the quality or for the monitoring and what indicators are used?

Load unfinished survey

Submit



Appendix 2: Short questionnaire

Introductory text

Dear Madam/Sir,

We would like to get a better understanding of the importance of the functions of grasslands for various stakeholders in Europe via a questionnaire, and we would really appreciate your opinion. The purpose of the questionnaire is to obtain thoughts and opinions of a range of stakeholders. Therefore, you do not have to be an expert to complete the questionnaire.

Filling in this questionnaire only takes a couple of minutes.

Thank you very much in advance. If you would like to have more information on our project or if you are interested in filling out a more extensive questionnaire, please visit our website www.multisward.eu

Importance of grasslands in Europe

Country

Question. Country

Belgium
Denmark
France
Germany
Ireland
Italy
Netherlands
Norway
Poland
Spain
Sweden
Switzerland
UK

Other (please specify)

Question. What is your region within your country? (*optional*)

Stakeholder

Question. To which group do you belong?

(Choose the option which best describes your situation)

Advisor / consultant
Education
Student
Industry
NGO

Policy maker
Research
Consumer
Farmer
Other (please specify)

Characteristics of the farm *(additional questions for farmers only)*

Question: Do you milk cows? (yes/no) *(if no, the other questions will not appear on the screen)*

Question: Do you milk with an AMS? (robot) (yes/no) *(please indicate yes or no)*

Question: What is the estimated amount of fresh grass intake in the field per cow? (in dry matter – DM)

(0 kg DM/cow (no grazing) ; 0-5 kg DM/cow ; 5-10 kg DM/cow ; more than 10 kg DM/cow)

(If you do not know exactly, please provide your best estimate)

Question: What is your herd size? Number of dairy cows *(numbers only; please provide the number of cows)*

Question: Milk yield. Estimated average kg milk per year per cow *(numbers only; please provide your best estimate of the average kg milk per year per cow)*

General

Question. What is your age?

<20

20-30

30-40

40-50

50-60

>60

Question. What is your level of education?

Primary school

Secondary school

High school / technical school

University

Other (please specify)

Question. Gender

Female

Male

Sustainability

Sustainability is high on the societal, political and economic agendas. Sustainability covers economic, ecological and social interests.

Question. Please divide 10 points over these three aspects of sustainability, giving most points to the one you consider most important aspect: (e.g. 4, 3, 3 if you consider that ecological and social aspects are of equal interest and that economy is slightly more important)

Economic

Ecological

Social

Please provide a number

Please divide 10 points, total of the three entries should be 10

Functions of grasslands

This is our main question. IT IS ALSO THE FINAL QUESTION. Thank you!

Question: Which functions of grasslands do you consider important in your region?

(1 = not important; 5 = very important)

(functions listed below will appear at random in the questionnaire)

Biomass for energy production

High quality forage

Dairy cow milk production

Goat milk production

Sheep milk production

Wool production

Honey production

Beef meat production

Goat meat production

Sheep meat production

Production of plant fibre (e.g. for paper)

Low cost animal feed

Feed protein supply at farm level

Nutritional quality of animal products for human consumption

'Region of origin' of animal products

Grazing

N fixation via legumes

Adaptation to climate change

Mitigating greenhouse gas emissions

Conservation of the quality of ecosystems

Biodiversity

Avalanche control

Pathogen control in cropping systems

Erosion control

Fire control

Flood plains of rivers

Water catchment

Carbon sequestration/storage

Animal welfare

Availability of water

Conservation/improvement of soil structure and fertility in cropping systems

Crop pollination

Animal health

Maintaining populations in rural areas

Positive perception of animal production systems

Beauty of the landscape

Tourism or recreation

Supporting horses for equestrian sport and recreation

Cultural values

Rural development

Global food production

Competitiveness of farming systems

Other (please specify) (optional)

Please provide your opinion on the importance of these functions in at least 30 rows

Finally

Question: If you have anything you would like to add, please feel free to do so (optional)

Thank you!

Thank you for taking the time to complete this questionnaire.

If you would like more information about the MultiSward project or if you are interested in filling out a more extensive questionnaire, you are welcome to visit our website www.multisward.eu.